Looking at the FAccTs: Exploring Music Industry Professionals' Perspectives on Music Streaming Services and Recommendations

KARLIJN DINNISSEN, Utrecht University, The Netherlands

ISABELLA SACCARDI, Utrecht University, The Netherlands

MARLOES VREDENBORG, Utrecht University, The Netherlands

CHRISTINE BAUER, Paris Lodron University Salzburg, Austria

Music recommender systems, commonly integrated into streaming services, help listeners find music. Previous research on such systems has focused on providing the best possible recommendations for these services' consumers, as well as on fairness for artists who release their music on streaming services. While those insights are imperative, another group of stakeholders has been omitted so far: the many other professionals working in the music industry. They, too, are (in)directly affected by music streaming services. Therefore, this work explores the perspective of music industry professionals. We present a study that addresses the role of streaming services and recommender systems in their jobs. Results indicate this role is significant. Furthermore, participants feel that music recommender systems lack transparency and are insufficiently controllable, for both customers and artists. Finally, participants desire that music streaming services take charge of increasing recommendation diversity, and variety in consumers' listening behavior and taste.

1 INTRODUCTION

In any application where users may choose from many possible options, recommender systems (RSs) can help. Essentially, RSs collect individual preferences (e.g., from ratings and clicks) and provide recommendations, which influence the user's final decision [9, 27]. The major RS approaches include collaborative filtering, where relevant items are identified based on what similar users have liked or consumed [16], and content-based filtering, which considers items that are similar to a user's past liked or consumed items [22]. Hybrid RSs leverage both [3]. RSs often involve multiple stakeholders with potentially conflicting goals [1, 4]. One such multi-stakeholder domain is music. Music recommender systems (MRSs), integrated into *music streaming services*, help *consumers* (users) find relevant music provided by *artists* (item providers) [29]. A fourth role is played by *professionals* working in (i) roles directly tied to artists (e.g., labels, managers), (ii) music production, promoter, or publisher roles, and (iii) fields such as consultancy and event booking. MRSs face unique challenges, such as handling vast numbers of short items that users may consume in succession, multiple items fitting a query equally well, and users who may appreciate repeated recommendations [29].

Generally, RS research focuses on improving user satisfaction or recommendation quality for users [17]. Many researchers argue, though, that we must consider all stakeholders' values when developing RSs [8, 15, 33]. Otherwise, such systems could cause unwanted side effects or discrimination against people who are dependent on them [7, 13]. In research that addresses stakeholder values, fairness, accountability, and transparency (i.e., FAccT) are often emphasized. The concept of fairness in RSs primarily denotes a fair outcome for individuals or groups of individuals [13]. Diversity (i.e., variety in representations [25]) might be a means to promote fairness [6, 19]. Transparency may help people understand RSs' encoded fairness objectives, which users deem crucial [32]. Users also tend to like and trust recommendations they perceive as transparent [31]. Contrarily, RS opaqueness and limited ability to influence or control RSs can cause frustration and resignation [10, 14, 30]. More control for users may also encourage exploring new items [20, 21].

Following an increased interest in gaining insights into human perspectives [35], some works (e.g., [28]) directly reach out to MRS users. Two user studies in which artists are interviewed conclude that FAccT, control, and diversity in MRSs should improve [10, 14]. Still, the fourth stakeholder group—music industry professionals—has been omitted in user research in the MRS context. Such indirect stakeholders are often neglected, even though they are affected too [15]. Some music industry professionals are affected because they directly engage with streaming services and their embedded MRSs in their job, while others might depend on artists' success, which is influenced by streaming services. Due to the lack of research on these professionals' values, we cannot fully grasp how this group is affected by streaming services, nor can we use such insights to improve MRS design, development, and evaluation. Therefore, this *exploratory* work aims to answer: *What is the perspective of music industry professionals on:*

- The role of music streaming services and embedded MRSs in their jobs? (**RQ1**)
- Fairness, diversity, transparency, and control of music streaming services and embedded MRSs *for artists*, and accountability for streaming services on those topics? (**RQ2**)
- Variety, transparency, and control *for users* in music streaming services and embedded MRSs? (**RQ3**)

2   METHODS

We conducted a survey at Eurosonic Noorderslag, an annual major European conference for music industry professionals held in the Netherlands in January 2023.[1] A total of 35 participants completed the informed consent form and questionnaire on a provided tablet (33) or after the conference (2).[2] They represented seven European nationalities, were spread over a wide age range, and held diverse music industry-related roles: Table 1 provides an overview.[3]

Questionnaire. We chose a questionnaire format instead of interviews [10, 14, 30, 32] as it seemed a better fit to reach more professionals. We started the questionnaire by describing that questions were phrased from three stakeholders' points of view: (1) *Participants* in their professional life (RQ1); (2) *Artists* who release music on streaming services (RQ2); (3) *Consumers* of music on streaming services (RQ3). Hereafter, we asked participants in which role(s) or sectors they currently worked (multiple choice). If participants discover or review new artists or music in their role(s), questions about streaming services' role in that process were added. Similarly, participants who create music, or provide music on streaming services as part of their job, also received additional questions on this. The topics of the subsequent questions were inspired by studies on artists' perception of MRS FAccT, control, and diversity [10, 14], artists' playlisting strategies [30], and users' perceptions of FAccT in RSs [32]. We primarily used a 5-point Likert-scale answering format where participants could express agreement with a statement. They could indicate 'Don't know/prefer not to answer',

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[1]https://esns.nl/en/
[2]All materials can be accessed at [11], and all raw data can be accessed at [12].
[3]'Artist' was not the sole role of any participant.

skip questions, and add comments. Terminology was explained throughout. Notably, 'diversity' was explained how it is commonly used outside the RS community ("the presence of differences that may include, e.g., gender, religion, sexual orientation, ethnicity, and language"); to denote 'diversity' in the RS community sense, we used 'variety'.

Table 1. Participants' demographics. Percentages of the total number of respondents are reported in parentheses.

Gender (%)	Men	Women	*unknown*					
	22 (62.9)	12 (34.3)	1 (2.9)					
Age (%)	18-25	26-35	36-45	46-55	56-65	*unknown*		
	5 (14.3)	9 (25.7)	9 (25.7)	7 (20)	4 (11.4)	1 (2.9)		
Nationality (%)	Dutch	Greek	Bulgarian	Irish	French	German	*unknown*	
	16 (45.7)	2 (5.7)	1 (2.9)	1 (2.9)	1 (2.9)	1 (2.9)	13 (37.1)	
Role (%)	Education	Technology	Event Production	Booking	Artist	Research	Marketing/PR	Other
	10 (28.6)	7 (20)	6 (17.1)	5 (14.3)	5 (14.3)	4 (11.4)	4 (11.4)	6 (17.1)
Years active (%)[a]	1-5	6-10	10-15	16-20	>25	Not app.	*unknown*	
	9 (25.7)	4 (11.4)	5 (14.3)	2 (5.7)	6 (17.1)	8 (22.9)	1 (2.9)	

[a] Participants who chose 'not applicable' (*Not app.*) had roles less explicitly related to the music industry (e.g., education, research and event production).

Data processing and analysis. We used descriptive statistics to report averages on participant agreement rates, and Mann-Whitney U tests to compare independent groups. Responses marked as 'Don't know/prefer not to answer' or skipped are reported but excluded from further analysis. We also investigated differences between several binary subgroups: genders; nationality (Dutch or non-Dutch); years of experience in the industry (>15 or ≤15 years); whether participants discover or review artists or music for work; and whether participants release or provide music on streaming services for work (hereafter referred to as 'music providers').[4] We also analyzed differences between participants with or without a role in education, but found no significant distinctions. Hence, we do not report this further.

3 RESULTS

We first report results for all respondents. If significant insights or distinct trends emerge based on the distinguished groups (see Section 2, 'Data processing and analysis'), we discuss them separately.

3.1 Point of View: Participant's Role (RQ1)

For RQ1, we studied participants' views on the role of streaming services in their jobs. 27 participants regularly use at least one such service for work, most often Spotify (N=24) and YouTube (N=18).

Transparency. Regarding their understanding of how MRSs work, participants were neutral to slightly negative (M=2.83, SD=1.10), indicating a lack of precise MRS knowledge regardless of their professional role. Understanding how to get insight into play counts and audience statistics was similar (M=2.77, SD=1.35); a lower agreement was reported (M=2.50, SD=1.19) when asked whether they feel sufficiently informed to make strategic decisions. Participants reported a slightly negative agreement (M=2.63, SD=1.48) on whether they are in contact (or would want to be) with the music streaming services' representatives; this was rated significantly higher by music providers ($Mrank$=25.25) compared to those not in a provider role ($Mrank$=15.85, U=50.00, p=.022[5]; r=.40).

Changes to role after COVID-19. Compared to before COVID-19, participants saw an increase in the role of social media, streaming services, and algorithms in their work (M=3.51, 3.60, 3.69, and SD=1.25, 1.22, and 1.00, respectively). Also, music providers showed higher agreement on the importance of social media ($Mrank$=20.44 *vs* $Mrank$=16.60), streaming services ($Mrank$=21.44 *vs* $Mrank$=16.29) and algorithms ($Mrank$=19.57 *vs* $Mrank$=14.96).

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[4]Note: not all participants who provide music on streaming services consider themselves to be artists.
[5]Mann-Whitney U tests are reported not corrected for ties.

Questions for participants who discover or review music. For 21 participants, their job involved discovering or reviewing music. In this context, they most often used word of mouth (N=19), music streaming services (N=18), live shows or showcases (N=17), written media (N=15), and social media (N=13). Many used multiple channels. The most frequently used places or pages on music streaming services were discovery-oriented playlists (N=12), related artists or songs (N=10), and radio-like playlists (N=8).

3.2 Point of View: Artists (RQ2)

For RQ2, we asked participants to take the artists' perspective.

Transparency & control. When asked whether it is clear for which reason(s), when, and to whom an artist's music is recommended, participants (N=34) slightly disagreed (M=2.65, SD=1.17) and agreed that such things should be clearer for artists (M=4.28, SD=.77). Regarding participants' (N=32) satisfaction with artists' control over recommendations of their own music, most reported neutrally about the control over *which* music is recommended (M=2.91, SD=1.25); slightly more negative regarding control over *to whom* music is recommended (M=2.75, SD=1.22); and neutral on control over the *context* where music is recommended (M=3.16, SD=1.25). Participants reported it is unclear how to contact streaming services and their representatives (N=31, M=2.12, SD=1.26). They also found it slightly difficult to reach out to these services (M=2.29, SD=1.22). One participant commented, *"If you are big, you have a listening ear"*, suggesting that established artists would have an easier time contacting streaming services than lesser-known ones.

Balancing different artists. We asked participants which percentages of algorithmically recommended songs should be allocated to different types of artists. On average, participants suggested that 55% of recommended songs should come from artists who actively release new music compared to inactive ones (M=54.24, SD=21.47), 45% from new artists compared to established ones (M=44.55, SD=19.40), and 33% of artists in algorithmic recommendation should be popular, with the rest being not (yet) popular (M=33.33, SD=21.41).

Diversity and inclusion. Participants generally felt that streaming services do not care highly about diversity and inclusion (D&I) in MRSs (M=2.53, SD=1.01), yet impact D&I (M=4.11, SD=1.28), and have a responsibility to improve it (M=4.23, SD=1.12). Music providers considered this responsibility significantly lower than participants in non-provider roles ($Mrank$=13.8 *vs* $Mrank$=19.2, N=27, U=49, p=.019; r=.44). Participants (N=35) suggested recommending more music by new, lesser-known, non-mainstream artists (M=4.17, 4.11, and 4.09; SD=1.16, 1.04, and 1.13, respectively). They were also positive regarding including more local artists (M=3.91, SD=.97), artists from underrepresented genders (M=3.51, SD=1.36), ethnicities (M=3.47, SD=1.34), and nationalities (M=3.62, SD=1.31).

Quotas. Participants' responses regarding the suitability of enforcing quotas to increase D&I were varied. 9 participants opposed the idea; one participant noted, *"It should be about the quality"*. 16 respondents thought that quota could be a valid method for increasing D&I, especially to promote lesser-known artists (N=16), local artists (N=15), and artists from underrepresented genders (N=16). However, when asked for a particular quota percentage, most participants did not provide a specific number—as noted by one participant, *"[A] quota is a very delicate thing... It may bring some change for a certain time and if applied only with low percentages..."*. 3 participants suggested a percentage of 20–25% for lesser-known artists, one suggested 60% for local artists, and one 40% for underrepresented genders.

Gender differences. When asked whether quotas should be used to increase D&I, men ($Mrank$=13.43, N=22) agreed significantly less than women ($Mrank$=21.19, N=8, U=42.50, p=.031; r=.43). Men also reported lower agreement (Fig. 1) on whether streaming services currently care about D&I ($Mrank$=15.95 *vs* $Mrank$=16.09 respectively), whether they have an impact on D&I ($Mrank$=16.70 *vs* $Mrank$=18.96), whether they have a responsibility to increase it ($Mrank$=16.02 *vs* $Mrank$=20.21) and whether they should actively diversify MRSs ($Mrank$=15.05 *vs* $Mrank$= 20.42).
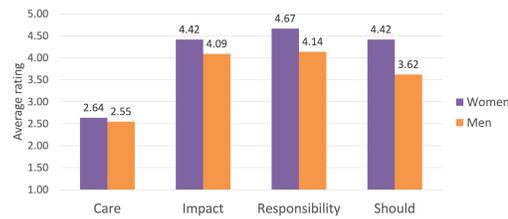
Fig. 1. Avg. agreement (1=Strongly Disagree; 5=Strongly Agree) per gender on whether streaming services *Care* about increasing diversity and inclusion (D&I), they *Impact* it, they have a *Responsibility* to increase it, and *Should* diversify users' recommendations.

Further, men significantly disagreed more than women (Fig. 2) on whether streaming services should recommend more music from non-mainstream artists ($Mrank$=14.98 *vs* $Mrank$=22.13, U=76.50, p=.044, r=.37), underrepresented genders ($Mrank$=14.57 *vs* $Mrank$=22.88, U=67.50, p=.016, r=.41), and underrepresented nationalities ($Mrank$=14.52, N=22 *vs* $Mrank$=22.96, U=66.50, p=.017, r=.42).
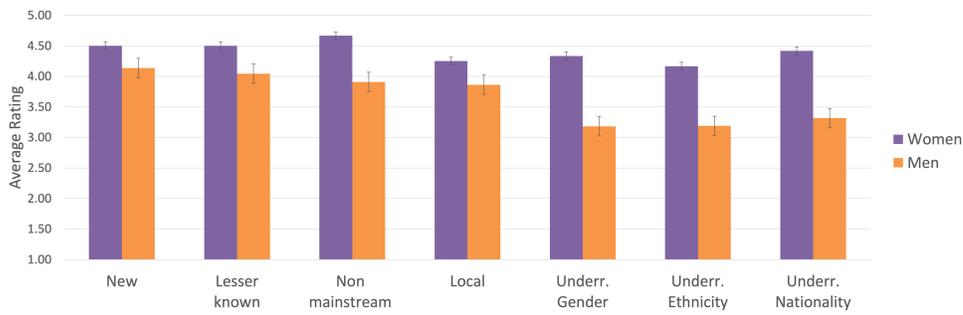

Fig. 2. Avg. agreement (1=Strongly Disagree; 5=Strongly Agree) per gender on whether streaming services should increase diversity and inclusion by including more *New* artists, *Lesser known* artists, artists making *Non-mainstream* music, artists from the users' *Local* area, artists from an *Underrepresented Gender*, an *Underrepresented Ethnicity*, and *Underrepresented Nationality*.

Questions for music providers. Music providers, if given control, would mostly recommend their latest release (M=3.63, SD=1.22), shortly followed by their personal favorites (M=3.38, SD=1.11) and most popular music (M=3.25, SD=1.20). They reported no clear preference regarding which type of users to target. To release their music, they most often used streaming services (N=6), physical formats (N=4), and social media (N=3). Music providers considered it especially important to be added to curated playlists on streaming services (M=4.25, SD=1.09), although they reported that it is not clear how to get on them (M=3.63, SD=1.22). They considered playlists created by algorithms generally important (M=3.75, SD=.97), although they reported a similar lack of clarity on how to get on those (M=2.5, SD=1.22).

3.3 Point of View: Consumers (RQ3)

Lastly, we report results on RQ3 from the consumer perspective.

Variety. Participants felt that streaming services should play a significant role in diversifying consumers' listening behavior by taking them out of their comfort zone (N=34, M=3.88, SD=.93) and aiming to diversify their recommendations (N=34, M=4.29, SD=.67), listening behavior (N=32, M=4.09, SD=.93), and general taste (N=32, M=4.03, SD=.85).

Transparency & control. Participants (N=34) felt it is slightly unclear for which reasons specific music is recommended to users (M=2.79, SD=1.37); all agreed this should be made clearer (M=4.38, SD=.54). They were neutral about

the extent to which consumers can control their general recommendations (M=3.0, SD=1.26) and their personalized playlists (M=3.38, SD=1.19). Music providers, in particular, were significantly less happy with the extent to which users can influence their personalized playlists ($Mrank$=10.21 vs $Mrank$=19.39, N=27, U=43.5, p=.027, r=.39).

4   DISCUSSION & CONCLUSION

Participants' role (RQ1). Participants indicated they use streaming services for work, but only slightly understand MRSs, and lack the insights they need from them to make strategic decisions. This could lead to frustrations similar to artists' [10, 14, 30]. Furthermore, music providers scored the importance of contact with streaming service representatives significantly higher than others, possibly due to the perceived importance of streaming in music release strategy and royalty revenue [10, 14]. Furthermore, our results show that, following the COVID-19 pandemic, participants' working lives are more digital: social media, streaming services, and algorithms all play more prominent roles. This corresponds to artists' perception [10], and to the idea that adopting digital capabilities is pertinent for creative subsectors to survive post-pandemic [18]. Lastly, streaming services play a considerable role in how participants discover or review music. This points to an underexposed use case; most literature focuses on MRSs for leisure purposes (e.g., [5, 24, 26]). Further exploring these professional use cases could result in a better match between functionalities and needs.

Artists (RQ2). Participants had several ideas on how to balance certain artists types, and generally also considered increasing D&I as very important. They felt that music streaming services have both impact and responsibility in this context, but that these services do not prioritize it. Future research should delve into the notable gender differences in this area. Further, participants seemed unsure of what could be good means to achieve D&I. Some suggested quotas, while others did not consider those viable, corresponding to artists' views [10, 14]. Among those who advocated quotas, only a few indicated specific percentages, illustrating the challenge to manifest this idea in specific numbers.

Consumers (RQ3). Corresponding to insights from some artist interviews [10] but not all [14], our participants envisioned streaming services to play a crucial role in diversifying consumers' music tastes and views on music. This might indeed be achieved by nudging users toward more exploratory behavior (e.g., [21]) or optimizing for a diversity goal (e.g., [23]). Participants had a slightly negative to neutral view of transparency for users, indicating a less clear call for increasing RS transparency than prior findings [32]. Also, participants had a slightly positive to neutral view on current control for streaming service users. This insight contrasts with a common focus on encouraging control for users over their recommendations (e.g., [2, 21, 24]). Further exploration of these discrepancies would be interesting.

Key insights & future work. In this paper, we provide the perspective of music industry professionals on fairness, transparency, and control in music streaming services and MRSs. We asked participants to consider several points of view: themselves as industry professionals, artists, and users. This work emphasizes the increasing importance of streaming services. Participants demand transparency and address the need to give users and artists more control. They also consider D&I highly important and feel that streaming services are responsible in this regard, though it still needs to be determined how exactly these services should improve it. By publishing the questionnaire and data Open Access (see [12]), we foster FAIR data practices and advancements in the field [34]. For future work, we suggest several pathways. As our sample is not representative, it seems fruitful to include participants from other continents and a broader set of music professional roles. A more anonymous setting could counter potential socially acceptable answers (e.g., on D&I). Interviewing professionals in-depth could deliver further insights. Lastly, studying how industry professionals' values could be implemented in streaming services' MRSs would be valuable.

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