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A Study on the Mechanisms Underlying the Formation of Fan Data Labour Driven by Platform Algorithms: A Case Study of Fan Culture on Weibo

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Abstract. The rise of social media platforms is shifting fan behavior within a celebrity worship context to be data driven and collective. This paper, based on the case of fan practices on Weibo, uses platform theory and digital labor theory to explore the formation mechanisms and main forms of platform algorithm-driven fan data labor.The study finds that mechanisms such as trending topics, recommendations, charts and rankings transform fans' emotional support into data-driven behaviors that can be recorded, calculated and compared. Fans' emotional identification motivates interactions such as 'liking', commenting, reposting, viewing and voting, leading to the emergence of collective data labor through task allocation, group supervision and data competition. These participatory activities not only boost content traffic but also enable the platform to harvest user data and create commercial value.At the same time, the boundary between emotional labor and digital labor continues to become more and more blurry, while data competition and group norms may add to the pressure of fans to maintain continuous participation. Based on this, the paper explores the connection between the emotional labor of fans, data labor and platform value. It offers a theoretical framework to understand the operational logic of fan culture in the era of digital platforms.

Keywords: Platform algorithms, Fan culture, data labour, Platformisation theory, Idol-chasing on Weibo

1. Introduction

The rise of social media platforms is redefining the nature of the relationship between fans and their idols. Platforms like Weibo and Douyin have developed from a space for information dissemination to an integral part of fans' emotional identification and engagement in idol activities.Activities such as "liking," commenting, reposting, voting, and striving for views and chart rankings mean that fan support for idols is no longer limited to emotional expression but is constantly transformed into quantifiable, comparable interaction data and traffic. Thus, the idol-chasing behavior has a dual nature: it is an expression of emotion and a form of data production.

This data production is not merely a simple accumulation of fans' spontaneous behavior, but it is deeply embedded in the algorithmic mechanisms of the platforms.Features like recommendations,

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trending topics, rankings and charts translate content visibility to quantifiable metrics that further guide and reinforce fans' modes of participation [1]. Community norms convert the emotional identification of people with their idols in fandoms into collective action; behaviors like 'liking', 'sharing' and 'voting' have been gradually shifted from personal choices to binding community tasks.Research has shown that Chinese Weibo fan communities have developed a unique hierarchical structure in their collective support and reporting activities. In this structure, core fans use digital skills and industry knowledge to organize and coordinate the labor of ordinary fans, while the work of ordinary fans is often unrecognized and unpaid [2]. This means that, although idol-chasing activities are driven by interest and emotion, they have been integrated into the platform's traffic and data production processes.

In this paper, the Weibo fan culture is taken as a case study to explore the mechanisms and main manifestations of the formation of fan data labor driven by platform algorithms based on the theories of platformisation and digital labor. It also considers the relationship between emotional identification, community norms and data labor. Based on this, the paper discusses the emotional pressures of fan participation and the value it generates for the platform, in an attempt to comprehend the digital transformation of fan culture – and the increasingly intertwined relationship between emotional engagement and data labor – from the perspective of the interaction between platform mechanisms and user participation.

2. Platform algorithms and the formation of fan data labour

2.1. Platform algorithms and the digitisation of fan behaviour

Traditionally, idol fandom was primarily realised through watching works, purchasing albums, participating in offline events and word-of-mouth promotion; fan support was characterised by a high degree of autonomy and decentralisation, making it difficult to record and measure uniformly. The rise of social media platforms has transformed this landscape: as idol fandom entered the digital sphere, the platforms' technical rules and algorithmic mechanisms began to shape the organisation of fan behaviour.Features like trending topics, recommendations and charts and topic rankings have transformed the previously difficult to measure concepts of 'attention' and 'support' into data measures such as likes, comments, shares, plays and chart rankings, thus giving fan participation a measurable digital form.

This change has also led fans to gradually become 'data fans' who actively use platform rules. Relevant research indicates that digital platforms have transformed the traditional unidirectional 'production–consumption' model into a cycle of deep interaction between the industry and its audience, with fans influencing charts, media exposure and content dissemination through individual and collective strategies [3]. In this process, algorithmic recommendations influence content exposure, trending topics and charts intensify competition for visibility, whilst data metrics convert levels of participation into comparable figures.Gradually, fans have shifted to increased liking, commenting and sharing and performing chart-related tasks to help promote the reach and ranking of idol-related content, rather than only browsing and expressing their love.

2.2. The formation of fan emotional attachment and data labour

Emotional identification with idols is one of the key motivating forces to maintain fans' participation in idol-chasing activities. Long-held feelings of affection, identification and belonging are further translated into concrete acts of support – such as liking, commenting, sharing, voting and viewing –

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that may be repeated in an effort to raise the idol's visibility and ranking. Thus, emotional identification is a primary motivational factor for fans' data-driven participation.A survey of 588 Chinese fans found that idol worship and willingness to participate as citizens are important psychological factors that drive fans to "generate data," and fan communities serve as a bridge between emotional factors and actual data-related behavior [4].

These emotionally charged behaviors also have the characteristics of data production from the perspective of digital labor. Fans "like", comment, share, view and vote. They are constantly creating interaction data and traffic. The platform records and calculates to measure the effect of content dissemination and the level of user activity. Thus, the original emotional spontaneous participation is turned into data production which is valuable for the platform in the operational logic of the platform.

3. Main manifestations and mechanisms of fans' data labour

3.1. From interactive behaviour to platform data

In the digital platform environment, the fans' idol-chasing behavior is mainly reflected in the form of interaction. The platform continuously records the data metrics of the fans' idol-chasing behavior. Likes, comments and shares directly increase the interaction volume and reach of a piece of content, while view counts are indicative of its viewing performance and voting and chart-topping activities help fans translate their support into quantifiable outcomes such as rankings, vote counts and popularity. Thus, the data statistics system of the platform embeds the emotionally charged idol-chasing behavior.

The theory of digital labor maintains that users of platforms not only consume content but are constantly producing data, attention and traffic. Clicks and interactions of social media users generate data that can be used by the platforms and thus become a key link in the production of value within digital capitalism [5], as Fox notes.Relevant research has shown that iQIYI has transitioned from just counting view counts to a more complex algorithmic measurement system, further mobilizing and commodifying fans' data practices through metrics like fan value and celebrity influence [6]. When chasing idols, fans' likes, comments, shares and views all leave digital footprints, which, with the continuous participation of a large number of users, gather into the overall traffic and popularity, thus improving the activity and dissemination performance of the relevant content.

This means that a crucial part of the data labor of fans is the transformation of everyday idol-chasing activities into a continuous process of data production. On one hand, fans subjectively show their support to their idols. In contrast, their interactive behaviors create the data and traffic that the platform needs. User participation, data creation and the value creation of the platform are closely connected.

3.2. From individual participation to collective labour: the echo chamber effect

Fans' data-driven participation is not always an isolated action of an individual. The transformation of originally isolated individual behaviors into a long-lasting collective participation can be facilitated by joining relevant communities, where the influence of group norms and interaction mechanisms plays a role. Community administrators or core members will organize members to collectively repost, comment, participate in chart-ranking activities and vote by issuing tasks and setting participation requirements; mutual supervision among members further strengthens

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participation norms.A study of Chinese fans' platform-based practices shows that fan groups gradually develop a 'operationalised' organizational logic where labor is divided and tasks are assigned according to platform data rules, transforming spontaneous emotional expression into collective action with clear goals [7].

Identification with emotions is an important basis for participation in collective action and the common goals of the community strengthen this identification. When an idol is in a chart competition or a big event, fans gather around goals like better rankings, increased popularity, etc. The visibility of data results in the moment also incentivizes the repetition of such behaviors. The effect is that the individual emotional engagement gradually transforms into collective data work with its own tasks, division of labor and continuity.

Moreover, the information flow within fan communities shows strong characteristics of internal clustering. Previous studies have shown that in homogeneous interaction networks, information is more likely to be shared and reinforced among users with similar views, leading to a communication environment of 'echo chambers' [8]. For example, the members' extended exposure to similar information and group perspectives within fan communities may reinforce identity and norms of data participation, thus facilitating the conversion of individual emotional engagement into collective data labor.

3.3. From fan participation to platform value

The continuous involvement of fans in idol-chasing activities not only produces interactive data but also facilitates the spread of related content and increases traffic. Concentrated 'likes', comments, shares, views and votes can increase content's engagement metrics and visibility, which can potentially contribute to greater exposure. As more users engage with relevant topics, the reach of the content expands further, thereby forming a continuous process of 'fan participation – data growth – traffic increase'.

From a platform operations point of view, the data and traffic generated by fans is incredibly valuable to the platform. User interaction reflects user's interests, preferences and activity level, and provides a data foundation for user profiling and content recommendation. High-profile celebrities and fan-generated material, in turn, attract users to stay on the platform and continuously interact, thus improving the activity of the platform. The operation of digital platforms, as Van Dijk et al. state, is data-driven, algorithmically organized and governed by business models, thus making user participation a vital resource for the platform's sustained operation [9].Meanwhile, Tranova highlights that 'free labor' in the digital economy means that the users themselves voluntarily engage in the production of content and data, thus generating value for the platform that can be capitalized upon [10]. This logic is reflected in the data-driven participation of fans when compared to celebrity fandom. The scale of their interactions and traffic performance may also be related to advertising placements and commercial content partnerships.

Hence the need for continuous fan involvement on the part of the platforms, not only because fans can generate content but also because continuous interaction creates a continuous flow of data and traffic. Through trending topics, rankings and recommendations, platforms increase the visibility and competitiveness of participation, creating an incentive for fans to engage continuously. This then converts emotional engagement into measurable data, which feeds into the platform's traffic-generating and commercial-value-generating processes.

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4. Emotional mechanisms and issues in fan data labour

4.1. Emotional investment and the boundaries of labour

The defining characteristic of fan data labor is that it usually does not manifest itself as 'work'. For fans, actions such as liking, commenting and voting are first and foremost manifestations of emotion – concrete manifestations of 'liking someone' – rather than labor in the traditional sense. Hochschild argues that personal emotions, embedded in commercial or institutionalized rules of performance, can become a form of labor which can be managed and exploited [11]. Here, the emotional investment of fans exists in a gray zone. It is rooted in real and spontaneous emotion, but is constantly translated within the system of data evaluation of the platform into result-oriented behavior. The expression of emotion thus slowly takes on the character of sustained and repetitive labor.

This blurring of boundaries is evident in the more and more intimate relationship between fans and their idols.Bem argues that social media has created a more intimate connection between artists and fans, and that this connection requires continuous emotional investment and engagement to be maintained [12]. Thus, the act of supporting their idols is no longer simply one of appreciation, but has gradually become a relational practice that requires a sustained investment of time, attention and energy for fans. In this process emotional expression and digital labor become intertwined and spontaneous behavior, initially motivated by admiration, may gradually acquire the continuity and intensity of labor.

4.2. Data competition and pressure on fan behaviour

Once the fans' data labor has taken shape, the ranking, popularity and competitive mechanisms of the platforms could further reinforce sustained participation. Trends, charts and interaction data provide an intuitive comparison of the promotional performance of different idols, and fans can directly see the results of their own participation. When rankings and popularity are linked to a collective sense of honor among fans, data performance is no longer simply a collection of numbers, but a possible criterion to measure the "degree of support", which can drive fans to continue engaging to maintain or improve their idol's data performance.

Such a data competition could also shift from an individual to a group pressure. Relevant research has revealed that there is a relatively clear hierarchical division of labor within Chinese fan communities, where core members organize and mobilize ordinary fans to complete data tasks, while the labor input of ordinary fans often fails to receive commensurate recognition [2]. Task assignments, participation records and comparisons between members focused on charts, voting and popularity metrics are constantly fueling the group's collective goals . Members who decrease their participation may feel pressure that the collective goals of the group are being compromised.Daffy's research on 'desire labor' in social media shows that participants may continue to invest time, energy and even money because of expectations on future recognition and rewards [13]. Such data-driven participation may also be linked to consumer behaviors, such as purchasing albums or engaging in fan activities, within the framework of idol fandom.

Instead, it is the platform's data-driven competitive mechanisms that can increase engagement, and they may also construct a gradual process of emotional support turning into persistent and stressful behavioral patterns, combining emotional investment, data labor and consumer behavior, and further demonstrating the complex relation between fans' emotional engagement and the value production of the platform.

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5. Conclusion

Taking the practice of idol chasing on Weibo as an example, this paper explores the formation mechanisms of fans' data labor under the drive of platform algorithms, with the theoretical support of platform theory and digital labor theory. The study shows that platform mechanisms such as trending topics, recommendations, charts, and rankings convert the dispersed behaviors of chasing idols into recordable, quantifiable, and comparable data metrics; the emotional identification of fans with their idols is thus externalized into specific actions such as liking, commenting, reposting, playing, and voting, thereby establishing a close connection between emotional expression and data production.

Joining fan communities, task allocation, group supervision and data competition further organize individual behavior into collective data labor, characterized by continuity and division of labor. Fan participation, its data and traffic are the driving force for content dissemination, but also make it possible for the platform to accumulate user data, engagement and commercial value.

More importantly, this process makes the boundary between emotional engagement and labor production increasingly unclear. Fans are expressing their fondness and support subjectively, but they also invest time, attention and energy, and are influenced by competitive rankings and group norms. Therefore, emotions, data labor and platform value are interrelated in a complex relation. This mechanism helps us to identify the changes of fan culture in the era of digital platforms and the logic of data production underlying emotional engagement.

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