

A New Frontier in Film Studies: Applying Digital Humanities Methods to Indian Film Research

OKAMITSU Nobuko*, YAMASHITA Hiroshi** and KIKUCHI Yoshinao***

*Visiting Research Fellow, Chuo University, Japan

**Emeritus Professor, Tohoku University, Japan

***Curator, Tohoku University Library, Japan

E-mail: nobuko.yamashita.c1@tohoku.ac.jp*, hiroshi.yamashita.d8@tohoku.ac.jp**, yoshinao.kikuchi.d7@tohoku.ac.jp***

Abstract This paper proposes a framework for the use of the digital humanities (DH) methods in the analysis of Indian films, which has been subjected to bias from the use of the conventional qualitative methods that inevitably depend on the researchers' subjectivity and sensibilities. To date, the DH methods have been employed primarily in literary studies, with notable results. We are confident that these methods can also be applied to Indian film studies as they can provide deep insights into the Indian culture and society. Although the DH methods are still in the introductory stage in many ways, this study was a preliminary attempt to elucidate them as new methods that can be used in film studies.

Key words digital humanities, Indian films, quantitative methods, film studies

I. Introduction

Films are not only art forms but are also media products that most vividly reflect the social phenomena and characteristics of the times. Moreover, films may be considered research materials with great potential in area studies and the humanities. Nevertheless, research methods that are highly subjective have become mainstream in film studies, but without any significant academic contribution thus far. This is particularly notable within the academic circles in Japan, which will be further discussed later in this paper. This paper attempts to introduce digital humanities (DH) methods that capture cultural phenomena using data-based metrical methods to overcome the weaknesses of the conventional methods used in film studies.

Our analysis targeted Indian movies because quantitative methods are considered suitable for analyzing many Indian films, which have considerable homogeneity in their formats and contents, as will be discussed in this paper. Furthermore, Indian films exhibit great potential for contribution to area studies as research materials.

This paper proposes a framework for the use of the DH methods in Indian film analysis, which has been subjected to bias from the use of the conventional methods that rely on the analysts' subjectivity and sensibilities. Although the DH methods are still in the introductory stage in many ways, this paper represents a preliminary attempt to elucidate them as new methods than can be used in Indian film studies.

Films are entertainment media that are materialized on the basis of their mutual interaction with the society. That is, while they graphically represent the daily thought

processes and modes of interaction of a society at a given time, the trend of filmmaking is also subject to transformation in accordance with the contemporaneous social conditions and the spirit of the times.

Let us present an example. In India, economic liberalization, which began in 1991, encouraged the formation of a new middle class with its own lifestyle, social consciousness, and worldview (Isozaki, et al., 2016), and films with messages that represent their ideas emerged, thus cultivating audiences and a new market (Anjaria, 2015; Okamitsu, 2019). These films sought a more universal theme, apart from the stereotypes of the traditional Indian entertainment movies, and can be considered "the new middle-class subject in Indian cinema" (Okamitsu, 2019). They are essentially low-budget films without star-studded casts but with high-quality scripts, clear themes, appropriate casting, and moderate musical elements, and are increasingly evident to be a departure from the conventional Indian feature films. This emerging genre is the product of the transitions in the audience's preferences and the globalization of the movie industry in response to the structural changes that transpired in the Indian society, such as the expansion of the middle class following the economic liberalization. Therefore, it can be said that the emergence of this genre is none other than a product of social change.

As the conventional film studies depend solely on qualitative analysis, which is highly subjective, they are less credible and valid than the film studies that employ other methods. In such studies, it can sometimes be difficult to convincingly discuss the relationship between film and society due to the insufficiency of adequate samples and

the arbitrary selection of films for consideration. It is evident, therefore, that analysis methods such as DH, which are quantitative in nature and visualize the current content and market trends, can be used in film studies and can create possibilities therein.

As a discipline, film studies has long been established in Europe and the United States, and research on it is being conducted internationally. In the West, however, those who conduct research on film studies who do not know the regional language or do not even have a basic knowledge of the studied region sometimes formulate inappropriate arguments (Yamashita and Ravindran, 1994). In India, as there are different linguistic areas, a pan-Indian research perspective may not be valid. In any case, the research on Indian films in India still tends to be limited in terms of subject and method due to the researchers' subjective framework, scant problem awareness, and different areas of expertise. In Japan, these research pitfalls are even more evident. Vulgar and stereotypical images have been fixed and reproduced under the influence of inconsistent commercial media, and Indian films have long been alienated in academic spaces.

In addition to presenting effective options for elucidating the interface between film and society, this paper also explores the possibilities for the re-evaluation and re-interpretation of films and their directors from a fresh analytic perspective. This is a humble attempt to establish the study of Indian commercial films as a discipline, which has been much delayed in Japan.

II. Digital Humanities as a Research Method

1. A brief outline of digital humanities

Digital humanities or digital scholarship in the humanities contributes to human informatics in a broad sense, including through various researches in different fields related to human culture, such as philosophy, history, literature, linguistics, cultural anthropology, psychology, and sociology (Hamana, 2018, p. 59). The field of DH is quite new in academic circles, however, and the conceptual definition of this area of scholarly activity has not yet been firmly established.

The Digital Humanities Center at Stanford University in the U.S. is one of the best institutions focusing on research related to the DH methods. It claims that DH is situated at the crossroads of computer science and the humanities.¹ DH comprises research activities that seek to reinvent the humanities methodology. According to Inger Leemans, DH is not a discipline but a methodology by which materials may be analyzed (Fukuda, 2016, p. 52).

2. The dawn of DH and its waves

The history of DH began in the middle of the twentieth century, particularly in the 1930s and 1940s. Pioneering works on it were undertaken by Professor Josephine Miles and the Jesuit scholar Roberto Busa. In 1946, they began the project known as the *Index Thomisticus* by using a computer to index Thomas Aquinas's writings. This project, which began with collaboration with IBM, took a notably long time to complete (Buurma and Heffernan, 2018).

The works thus far that have been completed using the DH methods are categorized into two phases: the first wave of DH, which is called "Digital Humanities 1.0" (DH 1.0), and the second wave of DH, which is called "Digital Humanities 2.0" (DH 2.0) (Svensson, 2010). DH 1.0 spans the 1990s and early 2000s. This wave was focused on quantitative aspects such as large-scale computerization projects and the establishment of the basic technological infrastructure. For example, the digitalization of rare books is categorized into the first wave. The first-wave DH works primarily consisted of word-frequency studies in texts, textual analysis (classification system, tagging, encoding), hypertext editing, and text database construction. DH 2.0, on the other hand, which includes the contemporary DH works, is primarily concerned with the qualitative, interpretive, experiential, emotive, and generative aspects of texts. Since the advent of the second wave, the subjects explored by DH scholars have encompassed all human activity (Fukuda, 2016, p. 52). DH 2.0 has also moved beyond focusing on the text and emphasizes methods of graphical production and organization, design as an essential element of research, and transmedia interaction. It has catalyzed the extension of central conceptions of humanities knowledge, has provided transferable tools for collaborative research and environments, and has emphasized platform construction and curation as an important feature of academic practice (Burdick, et al., 2012, p. 7).

In film studies, however, the DH methods remain peripheral methods. As mentioned earlier, the Stanford Humanities Center, which has pursued DH research since the 1980s, is one of the most advanced institutions employing the DH methods. Most of the projects that have been undertaken by this institute have implemented tools such as 3D mapping, algorithmic literary analysis, advanced visualization techniques, and digitalization of textual corpora in non-Latin languages. Although the center has 15 ongoing workshops as of July 1, 2019, however, only one is related to film: "Intersections of Documentary Filmmaking, Race, and Engagement" led by Linda Randall

Meier. Furthermore, this project does not focus on film analysis utilizing computer science methods but on the exploration of the ethics of representing a community's story through racial perspectives in documentary filmmaking.²

3. Possibility of DH in Indian film research

As mentioned earlier, DH film research has yet to be popularized. However, the potential of the DH methods for use in the analysis of the mainstream Indian films cannot be denied. DH analysis is indeed suitable for Indian films for two primary reasons. The first is that a significantly large number of movies are produced each year in India. According to the Central Board of Film Certification (CBFC),³ 1,986 feature films were produced in India in 2016. As more samples are collected, increasingly accurate results can be generally obtained using the DH methods. The affinity between Indian movies and DH will be discussed in detail in a later section of this paper.

The second reason that DH analysis is suitable for Indian films is that most Indian feature films include similar components in a stereotypical melodramatic format (e.g., romance, fighting, comedic, and song-and-dance numbers) and have inconsistent story lines. When comparing the same elements derived from different films, common axes are necessary for conducting an effective analysis. By utilizing data visualization, including statistical graphs and charts, we can easily compare and analyze similar elements and establish element categories to identify the important features of Indian films and to subsequently reveal the structural changes in the Indian film industry.

The application of the quantitative DH methods to the conventional Indian film studies can supply fresh knowledge and insight that is not easily obtained using other analysis methods, and will give rise to new directions and perspectives with which the dynamism of Indian culture and society may be examined and understood.

III. On the Significance of Analyzing Indian Films Using DH Methods

1. Why do we target Indian films?

In this paper, we treat films as mirrors of social change. Our perspective does not prioritize the production motives or industrial backgrounds of films; rather, it emphasizes analyzing the changes in the audience's consciousness and preferences that define product popularity. We can designate two characteristics of Indian films that underscore their suitability for this type of analysis. The

first is the large number of Indian films produced annually. According to the feature film and cinema data of the United Nations Educational, Scientific and Cultural Organization (UNESCO),⁴ 1,986 films were produced in India in 2016, making it the highest film producer among the 150 countries in the list. China ranks second with 853, the U.S. third with 656, and Japan fourth with 610. India's first-place ranking is not the only thing that is notable here; the exceptionally wide margin by which it surpassed the other countries is likewise notable, with the number of films that it produced in 2016 not very far from the sum of the films produced in the same year by the countries in the second to fourth places. This large number of samples supports the view of film as an index reflecting social change. When only a single sample is examined, the survey results are likely to be influenced by arbitrariness and contingency, but when there are many samples, there is a greater probability of obtaining representative data.

Another advantage of adopting Indian films for our analysis is that the majority of the high-grossing Indian films are categorized into a popular entertainment type called "Masala film." Although there have been observable changes over time, Indian films are differentiated from the films of other countries in that many Indian films are melodramas and musicals with song-and-dance portions. This characteristic also supports mass analysis.

Our ultimate focus in this study was quantitative analysis with many samples. To compare some elements of the movies that were produced in the same year and to compare the film elements over a time period, it is necessary to set a fixed axis that allows the comparison of variable forms. Allow us to provide an example. The aforementioned UNESCO statistics include the top-10-hits rankings of each country.⁵ An earlier edition (2015) published data on 62 countries. The data include a "film type" index, and all the movies that were produced in the year are classified as "fiction," "animation," or "documentary." These three categories are rough, but it is notable that in almost all the countries in the list, movies under more than two categories (mainly fiction and animation) are included in the top 10 hits while in India, only movies under the fiction category are included. This reveals the peculiarity of Indian films.

The variation in film format in the countries other than India makes the data collection for comparative studies very complicated because it will be necessary to consider the features of the tripartite expression styles associated with each format. For example, the "flying Hanuman" image is easy to depict in animation, but certain techniques and production costs are required to represent it

in live-action fiction, and in documentary films, this is impossible. Thus, depending on the movie format, there are things that can and cannot be expressed, and certain contents are suitable for a given format but not for others. From this perspective, the use of the top Indian films for comparative film analysis is advantageous because they all have a fiction format. Moreover, Indian films are uniformly equipped with the strong traditional styles of “Masala film” or “Bollywood.”

2. Applicability of the DH methods to film analysis

In the field of film critique, scholars and critics often summarize whole trends by presenting some representative works. In most cases, phrases such as “recently increased ...” and “... is different from previous works” are likely appropriate and acceptable for those who watch many films. However, even if one agrees with the analysis of a film, this approach is not always sufficient to objectively decide if the given analysis is correct.

Unlike in the case of critical analyses of certain works or directors, there are some limitations to generalizing trends relating to social movements because there are few samples and there is limited space for analysis. Unfortunately, the same is true for those who want to verify previously obtained results. The analyses of the notable changes in the field of films in a certain country are considered having improved as there are already more samples and as it is impossible to consider too many samples for a given analysis. We believe, however, that we still lack common foundations for discussing whole social-change trends on the basis of evidences of such.

It has been reported that the recent Indian films have fewer “dream sequences”⁶ than the earlier Indian films. This means that scenes portraying dreams are included in films less frequently and that the emphasis on dream representation has lessened. However, no research has objectively demonstrated this tendency. In fact, this trend may be observed only in a negligible proportion of all Indian films. We may also ask if this trend increases each year or stagnates.

We believe that it is important to follow this line of inquiry. There are always a certain number of “new types of works” even if they did not emerge only recently. Thus, it is necessary to distinguish whether the changes that have taken place in middle-class films in recent years are observable only within the limited context mentioned above or can be said to point to a significant change transcending the historical formats and conventions.

How can we develop such an evidential basis for film analysis? To compensate for the methodological weak-

nesses of examining small sample sizes, as mentioned earlier in this paper, we discuss herein the possibility of utilizing the DH methods for broader quantitative analysis.

It is known that larger samples are correlated with improved reliability and generalizability. However, it is not only difficult but also unnecessary to target all the films released each year to conduct effective film analysis. For the purpose of our research, it is important that the films targeted for analysis exhibit an interactive influence on the society. In other words, we aimed to gather samples consisting of commercially successful, highly viewed films.

3. Procedure and limitations to be considered

The final objective of our study was to conduct a correlation analysis of the film and social changes that have recently transpired. To do this, we collected and recorded key items representing the changes from as many works as possible. The procedure is outlined below.

- (1) Selection of works to be analyzed
- (2) Planning of survey items
- (3) Recording of the survey items established in (2) for the films selected in (1)
- (4) Quantitative aggregation of the collected data, and visualization
- (5) Analysis of the results obtained in (4) in relation to the social changes in India
- (6) Evaluation of this method, and future prospects

We identified two primary issues in the procedure that were likely to affect our analytic efficacy. The first involves the selection of targets for analysis. This process proved to be more difficult than anticipated. In film research to date, we often see that the target works have been selected because they were among the top three box office hits for the year or were nominated for national or international awards regardless of their box office revenues. This manner of selecting analytic targets is not excessively difficult but is limiting. We hoped to address a wider selection of works. For example, what analytic results would be yielded by a work that ranked 17th at the box office? What criteria can we use to identify and select this work for analysis? The difficulties faced in obtaining reliable information on Indian films will be described in detail later in this paper.

While the relationship between the highest grossing or internationally acclaimed films and the society may reflect the social changes in India to a notable extent, the results derived from such sample will necessarily be limited. The scope of limitations, however, is currently unclear. To overcome these obstacles, we established an effective method of selecting a broad sample of works. Therefore,

our first task was the selection of films for analysis.

Another issue that emerged in our study had to do with the method by which qualitative data were converted into quantitative data. The criticism of the ambiguity of cultural and social study is likely linked to the circumstances in which quantitative data could not be derived as effectively as in natural-science research. For example, color data may seem objective in that it is relatively clear whether a person observes red or blue. However, in the context of the natural sciences, color data are considered qualitative, not quantitative, data that depend on individual subjectivity. In the natural sciences, a color value can be expressed numerically as a wavelength, which can be obtained using spectral analysis. This method yields clear and quantitative data compared to naked-eye observation as “red” and “blue” are relative labels perceived differently by person. Should we thus introduce a method of expressing color as a numerical wavelength, as in the natural sciences? Will this make our analysis results more accurate and meaningful, and richer? Will it define certain cultural or societal elements more clearly?

The foregoing questions apply to film analysis because we believe, albeit in a different sense, that naked-eye observation is also likely inadequate in the field of humanities. For cultural and social research, however, the respondents’ perceptions of color, which are subjective data, are important. Technically accurate data, such as what may have been perceived as blue actually being red according to the spectrum data, do not always make sense in non-scientific situations. After all, a film is a set of information impressed through the human senses as images and sounds. Even if two scenes have the same colors or sounds in numerically converted data, they may look or sound different depending on the combination and context of the colors and sounds. In this case, which analytic method will result in a more “accurate” understanding of the information conveyed or of the meaning and influences experienced by the audience from the scene? Here, we attempt to be somewhat empirical while allowing for ambiguity. In the following chapter, we present our attempts to address the two aforementioned primary issues.

IV. Target Film Selection

1. Data reference resources

Today, we can obtain a variety of information about Indian films, such as how popular and successful a film is and films’ set and celebrity gossip, forthcoming announcements, and awards and honors. This information is disseminated through various platforms, including internet

sites, movie magazines, and newspapers. Such platforms, however, do not offer much information about films’ box office revenues. CBFC compiles official data on Indian films and publishes annual reports online containing statistical information about them.⁷ From these reports, we were able to obtain summary data on Indian films. One of these is that 1,986 Indian digital feature films passed censorship from April 2016 to March 2017.⁸ However, the CBFC report does not include the box office revenues or rankings of individual films. The film rankings of each country published by UNESCO, on the other hand, includes foreign and domestic films that reached at least 10th place in box office revenues. Hollywood films such as “Furious 7” (4th), “Jurassic World” (7th), and “Avengers: Age of Ultron” (8th) are presented alongside Indian films.

The popularity rankings of Indian films can be found in commercial media. Box Office India,⁹ as the name suggests, is a large information site that specializes in reporting the box office revenues of Indian films. It releases information on the box office revenues not only of the domestic films released each year but also of overseas films. The Indian cinema magazine *Filmfare*¹⁰ presented the top 9 rankings in 2017, and the movie information site “koimoi”¹¹ provides the top 10 most popular films for each year. Their ranking order and box office revenue data are mutually independent. The sources of information are also independent and do not overlap.¹²

For our analysis, we aimed to target the maximum number of films with the greatest effect possible. In developing this study, a question arose: Which of these ranking sources should we use as a reference, and how many titles should we watch and analyze? Regarding the number of samples, Box Office India provides the top 50 rankings, thus yielding the largest sample size. In terms of the coverage period, Box Office India also provides stable data from 1994 onwards. As such, we utilized its database to mine basic information. While various box office data types are aggregated by this source, however, we noted the following considerations: (1) Indian films are produced in many languages,¹³ yet Box Office India focuses only on Hindi films (including films in other languages dubbed in Hindi); and (2) the information about past rankings is constantly updated, and the rank order changes at each viewing. Therefore, these potential limitations had to be addressed before proceeding with the analysis using the aforementioned data. For this, we set the conditions shown below.

(1) We limited our target to mainstream Hindi films in India, which have the most productions.¹⁴

(2) We archived the film ranking data and fixed them

based on the first viewing date, and we did not consider any subsequent changes.

(3) Box Office India provides three ranking categories: “India Box Office,” “Worldwide Box Office,” and “Overseas Box Office.” Films are further categorized by variable, such as “Top First Weekend Grossers” and “Top (Total) Grossers.” These rankings provide revenue data as well. In this study, we chose “Top Worldwide Grossers” in the “Worldwide Box Office” category as our data source.

(4) The “Top Worldwide Grossers” page lists the worldwide rankings as “Worldwide,” the domestic rankings as “India,” and the overseas rankings as “Overseas,” all on the same page. We used these three data types.

(5) When we collected the data, the rankings did not include the top 50 for each year. In one year, only the top 46 films were included. However, we confirmed such data and included the top 50 to ensure that the same number of films would be assigned to each year. We believe that the reason for such difference was that in some years, the titles that did not include the “Overseas” value were excluded in our first round of data collection.

2. Utilizing box office India data

According to the aforementioned statistics, we considered it possible to roughly estimate the ratio of top hits to the total box office revenues. In the 2014 figures of the CBFC Annual Report, 297 Hindi full-length digital films were noted. Taking this into consideration, the following estimation was possible. Box Office India provided the top 46 grossing films, those that earned 4,290 crores or above. The film in the 46th place earned 2.8 crores, so the box office revenue per title of the films below the 47th place may be considered less than 2.8 crores. That is, if all the 251 titles from the 47th to the 297th places earned a maximum of 2.8 crores, the total would only be 702.8 crores, which is approximately 14% of the revenues. In other words, if only the feature films will be considered, the top 46 titles’ revenues will comprise at least 86% of the total box office revenue of all the titles released in that year. This revenue figure lacks detailed information, however, such as the aggregation period, and we were unable to identify whether the DVD sales and streaming distribution were included in it. Even so, as this result ratio functions as a relative value that does not depend on detailed criteria, it can be said that the top 50 films account for a considerable proportion of the total box office revenue.

The claim that the top 50 Indian films should be expected to represent the changes in audience awareness in each era cannot be accepted as 50 is a small sample size for making such a conclusion, and it is not possible to

prove the generalizability of the results derived from such a sample with statistical significance. Considering the ambiguity and limitations of attempting to measure cultural phenomena, however, we used approximately 50 hits selected from Box Office India as our sample for observing social changes in the future research.

V. Concluding Remarks

It is possible to recognize the significance and potential of Indian films as research material in DH film analysis. Although the DH methods are considered quantitative, they may be employed for the statistical analysis of Indian films and for contributing to a macroscopic understanding of the long-term trends in Indian cinema as well as the dynamism of the society associated with cinema transitions. The DH methods may also provide a powerful means for analyzing a particular film or filmmaker as part of the scope of their potential contribution to the qualitative study of Indian films. Thus far, the DH methods have been employed primarily in literary research, but with notable results. We are confident that these research methods can be applied to Indian film studies as they will provide deep insights into the Indian culture and society.

Acknowledgement

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Notes

1. <http://shc.stanford.edu/digital-humanities> (accessed July 1, 2019).
2. <http://shc.stanford.edu/digital-humanities> (accessed July 1, 2019).
3. Central Board of Film Certification (CBFC). <https://www.cbfcindia.gov.in/main/> (accessed May 9, 2019).
4. UIS Statistics (UNESCO INSTITUTE for STATISTICS): Culture>Feature films>Feature film production - Genre (2016). <http://data.uis.unesco.org/> (accessed May 9, 2019)
5. UIS Statistics: Culture>Exhibition of Feature films>Top 10 movies viewed. <http://data.uis.unesco.org/> (accessed May 9, 2019).
6. A “dream scene” is a conceptual counterpart to a real scene. This is a scene visualizing the desire, reminiscence, and the unreal imagined by protagonists through song and dance. Often, the setting of this scene suddenly switches from that of the main story.
7. The latest issue is Ministry of Information & Broadcasting Government of India. Central Board of Film Certification (2017). <https://www.cbfcindia.gov.in/main/publications.html> (accessed May 9, 2019).
8. Ministry of Information & Broadcasting Government of India. Central Board of Film Certification (2017, p. 31).

9. Box Office India. <https://boxofficeindia.com/> (accessed May 9, 2019)
10. Filmfare.com: Box-office roundup of the year 2017. https://www.filmfare.com/news/bollywood/boxoffice-roundup-of-the-year-2017_-25879.html (accessed April 5, 2019).
11. koimoi.com: Top 10 Highest Grossing Bollywood Movies of 2019. <https://www.koimoi.com/box-office/highest-grossers/top-10-highest-grossing-bollywood-movies-of-2019/> (accessed April 5, 2019).
12. The “About Us” section of Box Office India includes a disclaimer: “The figures on the website are not taken from the producers or distributors of the respective films but are independent estimates from our sources and then cross-checked through cinema collections.” https://boxofficeindia.com/content.php?pagekey=about_us (accessed May 19, 2019).
13. In CBFC statistics, 43 languages appear. Hindi is the most popular language, and 364 films were made in Hindi (Ministry of Information & Broadcasting Government of India. Central Board of Film Certification, 2017, p. 55).
14. A total of 364 films were made in Hindi. (Ministry of Information & Broadcasting Government of India. Central Board of Film Certification, 2017, p. 55).

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