

영화정보 프로그램 연동형 데이터서비스에 관한 연구 - 부가정보 전송방법 중심으로

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A Study on Data Service linked to Movie Information Program - focusing on the Transmission Method of Additional Information

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[요 약]

COVID-19 사태로 인해 심각한 타격을 받은 영화산업은 영화 관객의 다양한 영화관람 요인을 전략적으로 활용하고 있는데, 시청자의 영화 관심도를 높이고 관람을 유도하기 위해 영화정보 프로그램을 통한 영화소개 활동을 대표적인 예로 들 수 있다. 영화정보 프로그램이 시청자들의 영화관람 의도를 높이는 효과적인 매체임을 고려할 때 영화정보 프로그램과 연동된 데이터서비스에 관한 연구는 의미가 있으며, 본 연구는 영화정보 프로그램 연동형 데이터서비스 연구에 있어서 핵심적인 주제인 영화정보 프로그램의 부가정보를 정의하고 부가정보의 전송방법을 고안하였다. 부가정보 정의는 KBS의 영화정보 프로그램인 <영화가 좋다>를 대상으로 이루어졌으며, 부가정보 전송방법은 디지털방송 국제표준 DVB-SI 기반으로 고안하였다. 본 연구는 데이터서비스의 응용 분야를 영화정보 프로그램으로 확장하며 영화산업에 새로운 홍보 전략을 제시한다는 점에서 의의가 있다.

[Abstract]

The movie industry, which has been hit hard by the COVID-19 crisis, is strategically taking advantage of a variety of factors that lead moviegoers to watch movies. For example, a movie introduction activity through a movie information program is a representative example in order to increase viewers' interest in a movie and induce viewing. Considering that a movie information program is an effective medium to increase viewers' intention to watch a movie, a study on data services linked with movie information programs is meaningful. This study devised a definition of additional information for a movie information program and a method of transmitting additional information, which are key topics in the study of movie information program-linked data service. Additional information definition was made for <I Like Movies>, a movie information program of KBS, and the additional information transmission method was devised based on the digital broadcasting international standard DVB-SI.

색인어 : 영화정보 프로그램, 데이터서비스, 디지털방송, DVB-SI, 영화산업

Keyword : Movie Information Program, Data Service, Digital Broadcasting, DVB-SI, Movie Industry

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1. Introduction

1-1 Research Background : Movie Industry Trends

Even in the early 2020s, few people predicted that the domestic movie industry would be in the current recession due to COVID-19. Since the first confirmed case in Korea on January 20, 2020, COVID-19 has dealt a huge blow to all industries in Korea, and the pattern of the impact varied by industry. For example, e-commerce, health, pharmaceuticals, etc. have been affected relatively little or recorded growth due to the pandemic, but oil refining, tourism and aviation have been severely damaged. Unfortunately, the movie industry, which uses movie theaters as its main distribution platform, is one of the industries that has suffered a relatively short-term loss in the 'non-face-to-face' era.

According to the <2020 Korean Movie Industry Settlement> [1], global market research firm <Comscore> published the global theater sales in 2020 to \$12.4 billion, down 71% from \$42.5 billion in 2019. In the case of the non-theater market, the decrease was smaller than that of the theater, but it also recorded 451.4 billion won, down 11.4% from the previous year. Overseas sales of Korean films were found to be \$83.61 million (91.9 billion won), up 13.3% from the previous year due to the impact of global OTT sales. The combined sales of the above three major divisions were 1.537 trillion won, which is a decrease of 58.0% compared to 2019 (See Fig. 1).

According to the <2020 Korean Movie Industry Status Survey>[2], which is conducted by the Korean Movie Council every year, it is difficult to estimate the exact figure for the overall size of the Korean movie market since 2020 is an exceptional case. However, considering that commercial theaters usually account for about 50% of the total sales in the survey, the total size of the Korean movie market in 2020 is highly likely to have fallen to 4 trillion won.

In conclusion, if we were to describe the Korean movie market in 2020 in one word, it would not be an exaggeration to say that it started with COVID-19 and ended with COVID-19.

1-2 Related Works

Consumers generally search for information before consuming. This information-seeking behavior itself acts as a consumer experience and affects not only information acquisition but also subsequent attitudes and behaviors. In the case of movies, it can be seen as a high-level active consumption behavior that requires time allocation and location movement when consuming a movie at a movie theater.

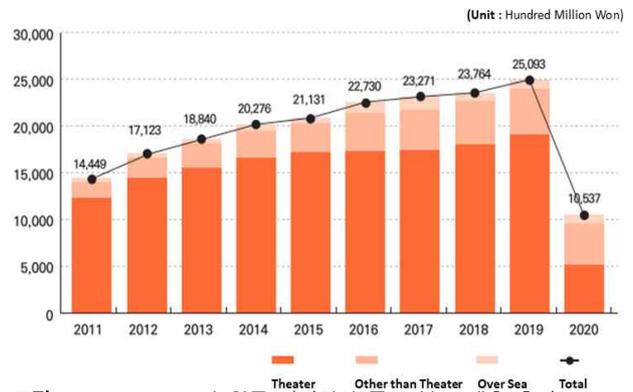


그림 1. 2011~2022년 한국 영화산업 주요 부문 매출 추이
 Fig. 1. Sales trends of the Korean movie industry (2011~2020)

Therefore, the movie information search is different from the general product or service. There are three main channels for acquiring movie information: traditional media such as newspapers and television, new media such as the Internet, and spread of information such as word of mouth [3,4].

The introduction of a movie in a movie information program also acts as an important factor in converting viewers into movie spectators. Because a movie is an experience product that is difficult to know about its quality before watching it, we feel a lot of risk of failure before consuming a movie. To reduce this risk, we search for a lot of information with various evaluation criteria, including movie advertisements, movie reviews, number of audiences, directors, genres. In addition, rather than direct marketing communication messages, audiences tend to use surrounding information to select movies. This is because acquiring movie information is the most effective in reducing uncertainty and risk factors in movie consumption. Specifically, movie-related articles or advertisements have a great influence on consumers' choosing a movie [5,6].

The role of a professional movie information program is important for direct movie selection. In the case of the publicity activities of the actors (of a movie about to be released) through movie advertisements or entertainment programs, it is effective to increase exposure to movies to secure awareness. However, the movie information program has more influence on consumer decision-making in that it provides reliable professional information to viewers and induces consumption [7].

1-3 Research Subject

According to the related research described above, it can be seen that the movie information program is an effective medium to increase the audience's intention to watch the movie. Therefore, it is meaningful to study a data service to increase viewers'

interest in movies by providing the additional information that is not provided (or insufficiently provided) in a movie information programs.

This study deals with key research topics in the development of a movie information program-linked data service. Specifically, this study defined additional information of a movie information program and devised an additional information transmission method based on the digital broadcasting international standard DVB-SI (Digital Video Broadcasting-Service Information)[8] to provide the defined additional information to data service. In addition, since movie information programs generally consist of several sections to introduce various movies, this study designed a method of exposing the additional information of the movies introduced in the section at the time of the broadcast time of the section. That is, when a specific section of the movie information program is broadcast, additional information of movies introduced in the section is provided to the viewer.

This study is meaningful in that it expands the application field of data service to movie information programs and suggests a new marketing strategy direction for the movie industry that has been severely hit by the COVID-19 crisis.

II. Additional Information Design

2-1 Additional Information Definition

The movie information program-linked data service ultimately aims to increase the viewer's intention to watch the movies (introduced in the movie information program) by providing additional information about the movies. To achieve this purpose, the contents of the additional information of the movie information program and the exposure time of the additional information should be appropriately designed based on the sections constituting the movie information program.

For example, if a movie information program consists of two sections, which introduces upcoming movies and then introduces hidden masterpieces, It would be appropriate to provide additional information such as the release schedule of the upcoming movie, director and actor information, and a reservation rate in the first section. And in the second section, it would be appropriate to provide additional information such as netizens' ratings and award history that support the fun and workability of the movie. As can be seen from the previous example, the data service should provide appropriate additional information at an appropriate time in accordance with the section composition of the movie information program to be linked.

In this study, <I Like Movies>[9], a movie information program of KBS, was selected as the movie information program to be linked with the data service (See Fig. 2). <I Like Movies> is a professional movie information program broadcasted on KBS from November 25, 2006. Unlike other broadcasters' movie information programs (e.g. MBC <Departure! Video Tour>, SBS <Access! Movie World>), <I Like Movies> is a national broadcast that is broadcast all over the country simultaneously and has no interim advertisements.



그림 2. KBS 영화정보 프로그램 <영화가 좋다>
Fig. 2. KBS Movie Information Program <I Like Movies>

표 1. <영화가 좋다>의 주요 섹션들

Table 1. Major Sections of <I Like Movies>

Section	Description
<Beginning of Rumor>	Introduces promotional content (director, starring, spectator points, etc.)
<Dizzying Interview>	Introduces the synopsis, actors roles, episodes, etc. in the form of an interview with the actors of upcoming movies
<1+1>	Introduces two movies with similar material alternately (not introducing the ending, causing curiosity)
<Playlist>	Introduces the finished movie in detail with a celebrity commentary (not introducing the ending, causing curiosity)
<Arrogant Movie>	Introduces hidden masterpieces that did not gain public popularity but were excellent in workmanship

<Table 1> is a summary of the major sections that make up <I Like Movies>. Note that the composition of the sections may vary for each episode of <I Like Movies>. In order to define additional information for each section of <I Like Movies>, 50 college students were asked to watch several episodes of <I Like Movies>, and then what kind of additional information they wanted to gain from each section of <I Like Movies> was investigated. Additional information was divided into 9 types: movie release information(T1), advance reservation rate(T2), cumulative audience(T3), director/actor(T4), netizen evaluation (T5), award history(T6), synopsis(T7), producer/distributor(T8), and similar material movie information(T9). Then, the students were asked to select what additional information they wanted in each section. The number of desired additional information is not limited.

표 2. <영화가 좋다> 섹션별 선호 부가정보 설문 결과 (섹션별 부가정보 유형 선택 학생 수)

Table 2. Survey result of additional information preferred by <I Like Movies> section

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9
<Beginning of Rumor>	48	40	22	42	15	9	31	38	19
<Dizzying Interview>	41	39	20	28	17	7	30	31	10
<1+1>	2	0	20	40	42	13	16	20	37
<Playlist>	3	0	37	48	45	30	30	21	1
<Arrogant Movie>	4	0	28	49	43	45	29	20	1

표 3. <영화가 좋다> 섹션별 응답자의 50% 이상 선호 부가정보

Table 3. Additional information preferred by more than 50% of respondents by <I Like Movies> section

Section	Preferred Additional Information
<Beginning of Rumor>	<ul style="list-style-type: none"> Release schedule, advance reservation rate, director/actor, producer/distributor, synopsis
<Dizzying Interview>	<ul style="list-style-type: none"> Release schedule, advance reservation rate, director/actor, producer/distributor, synopsis
<1+1>	<ul style="list-style-type: none"> Director/actor, netizens evaluation, similar material movie information
<Playlist>	<ul style="list-style-type: none"> Director/actor, netizens evaluation, cumulative audience, award history, synopsis
<Arrogant Movie>	<ul style="list-style-type: none"> Director/actor, netizens evaluation, cumulative audience, award history, synopsis

표 4. <소문의 시작>, <아찔한 인터뷰>의 부가정보 정의

Table 4. Additional Information of <Beginning of Rumor> and <Dizzying Interview>

```

<Info of Beginning of Rumor> | <Info of Dizzying Interview> ::= <ID> + <Title> + <Release Date> + <Reservation Rate> + <Director/Actor> + <Producer/Distributor> + <Synopsis>
<ID> ::= 0~255 // Section Additional Information ID
<Title> ::= Sting // Movie Title
<Release Date> ::= String // Movie Release Date
<Reservation Rate> ::= 0~100 // Reservation Rate
<Director/Actor> ::= <Director Info> + <Actor Info>
<Director Info> ::= <Director Name> + <D_Movies>
<Director Name> ::= String // Director Name
<D_Movies> ::= String // Movies made by Director
<Actor Info> ::= String // Starring Name
<Producer/Distributor> ::= <Producer Name> + <Distributor Name>
<Producer Name> ::= String
<Distributor Name> ::= String
<Synopsis> ::= Sting
    
```

표 5. <1+1>의 부가정보 정의

Table 5. Additional Information of <1+1>

```

<Info of One Plus One> ::= <ID> + <Movie_A Info> + <Movie_B Info> + <Similar Movies>
<ID> ::= 0~255 // Section Additional Information ID
<Movie_A Info> ::= <Movie Title> + <Director/Actor> + <Netizen Rating>
<Movie_B Info> ::= <Movie Title> + <Director/Actor> + <Netizen Rating>
<Movie Title> ::= String
<Director/Actor> ::= <Director Info> + <Actor Info>
<Director Info> ::= <Director Name> + <D_Movies>
<Director Name> ::= String // Director Name
<D_Movies> ::= String // Movies made by Director
<Actor Info> ::= String // Starring Name
<Netizen Rating> ::= 0~10
<Similar Movies> ::= String
    
```

표 6. <플레이리스트>, <도도한 영화>의 부가정보 정의

Table 6. Additional Information of <Playlist> and <Arrogant Movie>

```

<Info of Playlist> | <Info of Arrogant Movie> ::= <ID> + <Movie Title> + <Director/Actor> + <Netizen Rating> + <Cumulative Audience> + <Award History> + <Synopsis>
<ID> ::= 0~255 // Section Additional Information ID
<Movie Title> ::= String
<Director/Actor> ::= <Director Info> + <Actor Info>
<Director Info> ::= <Director Name> + <D_Movies>
<Director Name> ::= String // Director Name
<D_Movies> ::= String // Movies made by Director
<Actor Info> ::= String // Starring Name
<Netizen Rating> ::= 0~10
<Cumulative Audience> ::= 0~100,000,000
<Award History> ::= String
<Synopsis> ::= Sting
    
```

<Table 2> summarizes the survey result and <Table 3> shows the types of additional information selected by more than 50% of survey respondents by section. And <Table 4> to <Table 6> formally define the contents of the additional information for each section of <I Like Movies> based on <Table 3>.

2-2 Exposure Time of Additional Information

The movie information program-linked data service that this study aims at is an 'embedded' data service based on the international data broadcasting standard DVB-MHP[10]. The embedded data service has the characteristic that the execution code is stored in the digital broadcasting receiver in advance and is quickly executed when the viewer executes the data service [11].

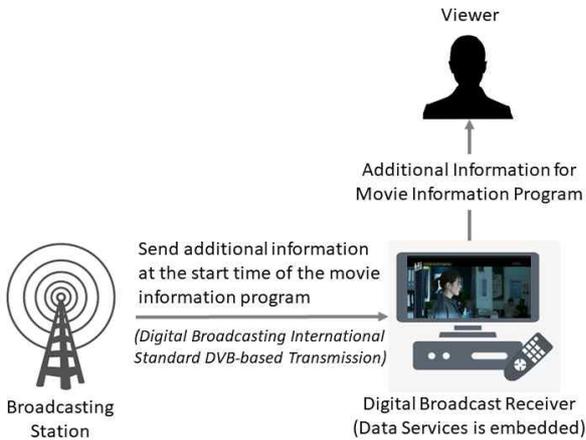


그림 3. 데이터서비스 운영 방식
Fig. 3. Data Service Operation Strategy

As the type and order of sections may vary for each episode of <I Like Movies>, the data service operation method is designed so that the data service itself is embedded in the digital broadcasting receiver, but additional information for each section of the movie information program is delivered to the data service according to the broadcasting start time of the movie information program (See Fig. 3). For reference, there are also methods of providing additional information to the application of a digital broadcasting receiver through the Internet[12,13], but this study aimed at a method of supplying additional information through the broadcasting network.

In this study, in order to inform the data service of the exposure time of the additional information by section of <I Like Movies>, the information on the exposure time of additional information for each section was formally defined as shown in <Table 7>. <Prog ID> is a unique identifier of a broadcast program managed by a broadcaster. <Section Info> consists of <Section ID>, an identifier for each <I Like Movies> section, and the start (<Start Time>) and end (<End Time>) times of the section. <Start Time> and <End Time> are expressed as an offset in seconds from the broadcast start time of <I Like Movies>. <ID> is an identifier of additional information to be exposed in the section designated by <Section Info>. <ID> is the same concept as <ID> existing in <Table 4> to <Table 6>.

III. Additional Information Transmitting Method

In this section, we devised a method to transmit additional information for each section of the movie information program <I Like Movies> and the exposure time information of the additional information to the data service by using the SI of DVB.

표 7. 부가정보 노출 시점 정의

Table 7. Exposure Time of Additional Information

<Info of Exposure Time> ::= <Prog. ID> + List of (<Section Info> + <ID>)
<Prog ID> ::= 0~65535 // Program ID
<Section Info> ::= <Section ID> + <Start Time> + <End Time>
<Section ID> ::= 0~255 // Section ID
<Start Time> ::= 0~65535 // Section Start Time
<End Time> ::= 0~65535 // Section End Time
<ID> ::= 0~255 // Section Additional Information ID

표 8. Exposure Time Descriptor 문법

Table 8. Exposure Time Descriptor Syntax

N	Syntax	Size
1	Exposure_Time_Descriptor(){	
2	descriptor_tag	8 bits
3	descriptor length	16 bits
4	program_ID	16 bits
5	for (i = 0; i < N1; i++){	
6	section_ID	8 bits
7	start_time	16 bits
8	end_time	16 bits
9	for (j = 0; j < N2; j++){	
10	ID	8 bits
11	}}}	

SI (Service Information)[8] is a protocol in the form of various tables defined to transmit the channel information and broadcasting program information (managed by a broadcasting station) to a digital broadcast receiver.

In this study, EIT-P was used to transmit additional information for each section of <I Like Movies> and information on the exposure time of additional information. EIT-P (Event Information Table-Present), a table of SI, contains broadcasting program-related information (e.g. program name, broadcasting time, parental rating, etc.), and can also include arbitrary information defined by a user using the concept of 'descriptor'. EIT-P is repeatedly transmitted in a short period of less than 500ms from the start to the end of the currently broadcasting program.

In this study, additional information for each section of <I Like Movies> and a descriptor to describe the exposure time information of the additional information were defined. Exposure_Time_Descriptor is a descriptor containing the exposure time of additional information for each section, and is defined as shown in <Table 8>.

표 9. Beginning of Rumor Descriptor 문법

Table 9. Beginning of Rumor Descriptor Syntax

N	Syntax	Size
1	Begining_of_Rumor_Descriptor() {	
2	descriptor_tag	8 bits
3	descriptor_length	16 bits
4	ID	8 bits
5	movie_title_length	8 bits
6	for (i = 0; i < N1; i++)	
7	char	8 bits
8	release_date_length	8 bits
9	for (i = 0; i < N1; i++)	
10	char	8 bits
11	reservation_rate	8 bits
12	director_name_length	8 bits
13	for (i = 0; i < N2; i++)	
14	char	8 bits
15	director_movie_length	8 bits
16	for (i = 0; i < N3; i++)	
17	char	8 bits
18	actor_name_length	8 bits
19	for (i = 0; i < N4; i++)	
20	char	8 bits
21	producer_name_length	8 bits
22	for (i = 0; i < N6; i++)	
23	char	8 bits
24	distributor_name_length	8 bits
25	for (i = 0; i < N7; i++)	
26	char	8 bits
27	synopsis_length	8 bits
28	for (i = 0; i < N8; i++)	
30	char	8 bits
31	}	

The 'descriptor_tag', which is a descriptor identifier, has a range of 0x80 to 0xFE indicating that it is a user-arbitrary descriptor. 'descriptor_length' indicates a descriptor size, and 'program_ID' is an identifier of a movie information program. 'section_ID' is an identifier for each section of <I Like Movies>, and 'start_time' and 'end_time' indicate the start and end time of the section as an offset in seconds based on the start time of the broadcast of <I Like Movies>. Lastly, 'ID' is a descriptor identifier that contains the additional information about this section.

Beginning_of_Rumor_Descriptor includes the additional information of <Beginning of Rumor> and is defined as shown in <Table 9>.

표 10. One plus One Descriptor 문법

Table 10. One plus One Descriptor Syntax

N	Syntax	Size
1	One_plus_One_Descriptor() {	
2	descriptor_tag	8 bits
3	descriptor_length	16 bits
4	ID	8 bits
5	movie_A_info() {	
6	movie_title_length	8 bits
7	for (i = 0; i < N1; i++)	
8	char	8 bits
9	director_name_length	8 bits
10	for (i = 0; i < N2; i++)	
11	char	8 bits
12	director_movie_length	8 bits
13	for (i = 0; i < N3; i++)	
14	char	8 bits
15	actor_name_length	8 bits
16	for (i = 0; i < N4; i++)	
17	char	8 bits
18	netizen_rating	8 bits
19	}	
20	movie_B_info() {	
21 ~ 36	/* identical with movie_A_info */	72 bits
37	}	
38	similar_movie_length	8 bits
39	for (i = 0; i < N11; i++)	
40	char	8 bits
41	}	

'ID' is a unique descriptor identifier, and after that, information such as the release date, reservation rate, director/actor, producer/distributor, and synopsis is sequentially described. Dizzying Interview Descriptor for the additional information of <Dizzying Interview> is composed of the same contents as in <Table 9>.

One_plus_One_Descriptor contains additional information of <1+1> and describes the title, director/actor, and netizen rating information of two movies, and describes movies with similar material to these two movies (<Table 10>).

Playlist_Descriptor contains the additional information of <Playlist> and describes the title of the movie, director/actor, netizen rating, cumulative audience number, and award history

information (<Table 11>). Arrogant_Movie_Descriptor for describing the additional information of <Arrogant Movie> is composed of the same contents as in <Table 11>.

The descriptors are loaded on the EIT-P and transmitted to the digital broadcasting receiver at the start of the broadcast of <I Like Movies>. Data service first uses the information contained in Exposure_Time_Descriptor to determine which section is currently being broadcast, and extracts the descriptor identifier (<ID>) containing the additional information of this section. Then, after extracting the descriptor corresponding to the identifier, the additional information of the section is configured appropriately based on the contents contained in the descriptor and outputted on the TV screen. For reference, Fig. 4 shows the typical structure of the user interface of program-linked data services. When the broadcast program starts, it is notified that there is a data service linked at the top of the TV screen (Fig. 4-(a)), and when the viewer executes the data service by operating the remote control as notified, the additional information is output using a space that does not exceed one third of the TV screen (Fig. 4-(b)).

표 11. Playlist Descriptor 문법

Table 11. Playlist Descriptor Syntax

N	Syntax	Size
1	Playlist_Descriptor() {	
2	descriptor_tag	8 bits
3	descriptor_length	16 bits
4	ID	8 bits
5	movie_title_length	8 bits
6	for (i = 0; i < N1; i++)	
7	char	8 bits
8	director_name_length	8 bits
9	for (i = 0; i < N2; i++)	
10	char	8 bits
11	director_movie_length	8 bits
12	for (i = 0; i < N3; i++)	
13	char	8 bits
14	actor_name_length	8 bits
15	for (i = 0; i < N4; i++)	
16	char	8 bits
17	netizen_rating	8 bits
18	cumulative_audience	32 bits
19	award_history_length	8 bits
20	for (i = 0; i < N5; i++)	
21	char	8 bits
22	}	

IV. Conclusion

A movie is a cultural product where experience is important, and a promotional strategy differentiated from general products and services is required. For example, a strategy is possible in which actors directly or indirectly promote a movie by appearing on entertainment information or an entertainment program. In addition, introducing movies through professional movie information programs is also used as an important strategy to convert viewers into movie spectators.



(a) TV screen showing the notification of the data service



(b) Interface structure of data service on running

그림 4. 데이터서비스 사용자인터페이스 구조

Fig. 4. Data Service User Interface Structure

This study defined the additional information of movie information program using the case of <I Like Movies> and devised the transmission method of the additional information, which are core research contents in developing data services linked to the movie information program. Specifically, the preferred additional information for each section of <I Like Movies> was investigated for 50 college students, and the content of additional information for each section were formally defined. The exposure time of the additional information were also defined to provide additional information according to the broadcast time of the section. In addition, a method was devised to transmit additional information for each section and exposure time information to the data service using the SI table of DVB, an international standard for digital broadcasting.

Because this study was conducted with a specific movie information program called <I Like Movies>, it is necessary to extend this study so that it can be applied to general movie information programs. For the end, we plan to study the method for formally describing the section of a movie information program and preferred additional information for each section, and transmitting this information to a data service using DVB-SI. As a future research project, we also intend to investigate the effect of data service utilization on viewers' intention to watch a movie by implementing a data service prototype based on the contents of this study.

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