United States Patent	12395691
Kind Code	B2
Date of Patent	August 19, 2025
Inventor(s)	Kozuka; Masayuki et al.

Video display system and video display method

Abstract

A video display system includes: a VR system including a display that displays a VR space to a participant who participates in a VR experience, and an audio processor that receives and outputs voice; an explainer terminal that receives and outputs voice from and to an explainer who provides an explanation to the participant in the VR space; a video distributor that distributes a 360-degree video for the VR space to the VR system; an audio conversation unit that assists an audio conversation between the participant and the explainer; and a controller that manages an operation mode that selectively takes a first state in which questions from the participant to the explainer are not allowed, a second state in which questions are allowed, and a third state in which a question is being asked, and causes the VR system to display information specifying the operation mode on the display.

Inventors:	**Kozuka; Masayuki (Tokyo, JP), Mori; Yoshihiro (Osaka, JP), Suzuki; Junya (Kyoto, JP), Kashiwagi; Yoshiichiro (Kyoto, JP), Yamamoto; Yasutoshi (Osaka, JP), Nishio; Toshiro (Osaka, JP)**
Applicant:	**Panasonic Intellectual Property Management Co., Ltd.** (Osaka, JP)
Family ID:	**1000008767285**
Assignee:	**PANASONIC INTELLECTUAL PROPERTY MANAGEMENT CO., LTD. (Osaka, JP)**
Appl. No.:	**18/286357**
Filed (or PCT Filed):	**April 18, 2022**
PCT No.:	**PCT/JP2022/018089**
PCT Pub. No.:	**WO2022/220308**
PCT Pub. Date:	October 20, 2022

Prior Publication Data

Document Identifier	Publication Date
US 20240196062 A1	Jun. 13, 2024

Related U.S. Application Data

us-provisional-application US 63176004 20210416

Publication Classification

Int. Cl.: **H04N21/218** (20110101); **G02B27/01** (20060101); **G06F3/01** (20060101); **G06F40/58** (20200101); **G06T5/50** (20060101); **G06T7/20** (20170101); **G06T15/00** (20110101); **G06T17/00** (20060101); **G09G5/36** (20060101); **H04N21/235** (20110101); **H04N21/431** (20110101); **H04N21/439** (20110101); **H04N21/472** (20110101); **H04N21/4788** (20110101); **H04N21/81** (20110101)

U.S. Cl.:

CPC **H04N21/4316** (20130101); **G02B27/0172** (20130101); **G06F3/011** (20130101); **G06F3/013** (20130101); **G06F40/58** (20200101); **G06T5/50** (20130101); **G06T7/20** (20130101); **G06T15/00** (20130101); **G06T17/00** (20130101); **G09G5/36** (20130101); **H04N21/21805** (20130101); **H04N21/2353** (20130101); **H04N21/439** (20130101); **H04N21/472** (20130101); **H04N21/4788** (20130101); **H04N21/8106** (20130101); **H04N21/816** (20130101); G06T2207/20221 (20130101)

Field of Classification Search

CPC: H04N (21/4316); H04N (21/21805); H04N (21/2353); H04N (21/439); H04N (21/472); H04N (21/4788); H04N (21/8106); H04N (21/816); H04N (7/183); H04N (21/4312); H04N (21/4728); G06F (3/013); G06F (40/58); G06T (5/50); G06T (7/20); G06T (15/00); G06T (17/00); G06T (2207/20221); G06Q (30/0643); G06Q (50/01); G06Q (50/10); G06Q (90/20); G09G (5/37)

References Cited

U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
9794514	12/2016	Yoakum	N/A	H04M 3/564
9911238	12/2017	Doronichev et al.	N/A	N/A
2013/0038692	12/2012	Ohtomo et al.	N/A	N/A
2016/0117853	12/2015	Zhong et al.	N/A	N/A
2016/0300392	12/2015	Jonczyk et al.	N/A	N/A
2016/0350977	12/2015	Doronichev	N/A	H04W 4/21
2017/0061231	12/2016	Higa	N/A	N/A
2017/0061813	12/2016	Tao et al.	N/A	N/A
2017/0142486	12/2016	Masuda	N/A	N/A
2017/0329144	12/2016	Usami	N/A	N/A

2018/0196425	12/2017	Kobayashi	N/A	N/A
2018/0249148	12/2017	Roulet et al.	N/A	N/A
2019/0005283	12/2018	Nikitin et al.	N/A	N/A
2019/0052838	12/2018	Ashkenazi et al.	N/A	N/A
2019/0139430	12/2018	Ghatage et al.	N/A	N/A
2019/0250601	12/2018	Donahoe et al.	N/A	N/A
2019/0266424	12/2018	Nishimura et al.	N/A	N/A
2020/0160740	12/2019	Nedivi	N/A	G09B 7/00
2020/0218072	12/2019	Inatani et al.	N/A	N/A
2020/0341714	12/2019	Yuasa et al.	N/A	N/A
2020/0363866	12/2019	Gerard et al.	N/A	N/A
2021/0225017	12/2020	Holzer et al.	N/A	N/A

FOREIGN PATENT DOCUMENTS

Patent No.	Application Date	Country	CPC
3032295	12/2017	CA	N/A
3793259	12/2020	EP	N/A
2002-169901	12/2001	JP	N/A
2007-207260	12/2006	JP	N/A
2012-010418	12/2011	JP	N/A
2013-038622	12/2012	JP	N/A
2015-005967	12/2014	JP	N/A
2016-090773	12/2015	JP	N/A
2018-112809	12/2017	JP	N/A
2019-503612	12/2018	JP	N/A
2019-036025	12/2018	JP	N/A
2019-075075	12/2018	JP	N/A
2019-149016	12/2018	JP	N/A
2019-164216	12/2018	JP	N/A
2019-195169	12/2018	JP	N/A
2019-197939	12/2018	JP	N/A
6727388	12/2019	JP	N/A
2020-120388	12/2019	JP	N/A
2020-176995	12/2019	JP	N/A
2015/170461	12/2014	WO	N/A
2016/009864	12/2015	WO	N/A
2017/108668	12/2016	WO	N/A
2019/150675	12/2018	WO	N/A
2020/116493	12/2019	WO	N/A

OTHER PUBLICATIONS

Extended European Search Report dated Aug. 27, 2024 issued in the corresponding European Patent Application No. 22788231.3. cited by applicant
Extended European Search Report dated Sep. 10, 2024 issued in the corresponding European Patent Application No. 22788228.9. cited by applicant
Extended European Search Report dated Sep. 12, 2024 issued in the corresponding European Patent Application No. 22788230.5. cited by applicant
Extended European Search Report dated Sep. 18, 2024 issued in the corresponding European Patent Application No. 22788229.7. cited by applicant
International Search Report issued on Jun. 28, 2022 in International Patent Application No.

PCT/JP2022/018089, with English translation. cited by applicant
International Search Report issued on Jul. 5, 2022 in International Patent Application No. PCT/JP2022/018087, with English translation. cited by applicant
International Search Report issued on Jul. 5, 2022 in International Patent Application No. PCT/JP2022/018088, with English translation. cited by applicant
International Search Report issued on Jun. 28, 2022 in International Patent Application No. PCT/JP2022/018086, with English translation. cited by applicant
Office Action dated Dec. 24, 2024 issued in the corresponding Japanese Patent Application No. 2023-514694, w/ English Translation. cited by applicant
Office Action mailed on Feb. 26, 2025 for the corresponding U.S. Appl. No. 18/286,346. cited by applicant
Office Action mailed on Apr. 2, 2025 for the corresponding U.S. Appl. No. 18/286,353. cited by applicant

---

Primary Examiner: Tilahun; Alazar

Attorney, Agent or Firm: Rimon P.C.

Background/Summary

CROSS-REFERENCE OF RELATED APPLICATIONS (1) This application is the U.S. National Phase under 35 U.S.C. § 371 of International Patent Application No. PCT/JP2022/018089, filed on Apr. 18, 2022, which in turn claims the benefit of U.S. Provisional Patent Application No. 63/176,004, filed on Apr. 16, 2021, the entire disclosures of which Applications are incorporated by reference herein.

TECHNICAL FIELD
(1) The present invention relates to video display systems and video display methods, and particularly relates to video display systems that provide services for an experience of a virtual reality (VR).
BACKGROUND ART
(2) Conventionally, various techniques have been proposed as video display systems that provide a service for experiencing VR (virtual reality) (see, for example, Patent Literature (PTL) 1 and PTL 2).
(3) PTL 1 proposes an at-home travel system which can give a remote user, by providing the remote user with a present actual situation of a tourist destination of choice in the form of real-time video, an impression and a realistic sensation as if the remote user is actually visiting the tourist destination.
(4) In addition, PTL 2 proposes an information processing device related to point-of-view control of a participant in sightseeing using VR.
CITATION LIST
Patent Literature
(5) [PTL 1] Japanese Unexamined Patent Application Publication No. 2012-10418 [PTL 2] WO2019/150675
SUMMARY OF INVENTION
Technical Problem
(6) However, the techniques described in PTL 1 and PTL 2 are premised on the participants having high ICT (information and communication technology) competence and have a problem in that not everyone can readily participate.

(7) In consideration thereof, an object of the present disclosure is to provide a video display system and a video display method in which everyone can readily participate.

Solution to Problem

(8) To achieve the above object, a video display system according to one embodiment of the present disclosure is a video display system that provides a service for an experience of a virtual reality (VR), and includes: a VR system including a display that displays a VR space that is a video for the VR to a participant who participates in the experience, and an audio processor that receives and outputs voice from and to the participant; an explainer terminal that receives and outputs voice from and to an explainer, the explainer providing an explanation for the experience to the participant in the VR space; a video distributor that distributes a 360-degree video for generating the VR space to the VR system; an audio conversation unit that assists an audio conversation between the participant and the explainer via the VR system and the explainer terminal; and a controller that controls at least one of the VR system, the explainer terminal, the video distributor, or the audio conversation unit. The controller manages an operation mode that selectively takes a first state in which a question from the participant to the explainer is not allowed, a second state in which the question is allowed, and a third state in which the question is being asked, and causes the VR system to display information specifying the operation mode on the display.

(9) To achieve the above object, a video display method according to one embodiment of the present disclosure is a video display method performed by a video display system that provides a service for an experience of a virtual reality (VR), and includes: a VR system including a display that displays a VR space that is a video for the VR to a participant who participates in the experience, and an audio processor that receives and outputs voice from and to the participant; an explainer terminal that receives and outputs voice from and to an explainer, the explainer providing an explanation for the experience to the participant in the VR space; a video distributor that distributes a 360-degree video for generating the VR space to the VR system; and an audio conversation unit that assists an audio conversation between the participant and the explainer via the VR system and the explainer terminal. The video display method includes: managing an operation mode that selectively takes a first state in which a question from the participant to the explainer is not allowed, a second state in which the question is allowed, and a third state in which the question is being asked, and causing the VR system to display information specifying the operation mode on the display.

Advantageous Effects of Invention

(10) The present disclosure provides a video display system and a video display method in which everyone can readily participate.

Description

BRIEF DESCRIPTION OF DRAWINGS

(1) FIG. **1**A is a conceptual diagram of a VR tourism system according to a reference example which enables conversations with a guide.

(2) FIG. **1**B is a block diagram illustrating a detailed configuration of the VR tourism system illustrated in FIG. **1**A.

(3) FIG. **2**A is a block diagram illustrating a configuration of a video display system according to an embodiment.

(4) FIG. **2**B is a block diagram illustrating a configuration of a controller according to Variation 1 of the video display system illustrated in FIG. **2**A.

(5) FIG. **2**C is a block diagram illustrating a configuration of a cloud according to Variation 2 of the video display system illustrated in FIG. **2**A.

(6) FIG. **2**D is a block diagram illustrating a configuration of a video display system according to

Variation 3 of the video display system illustrated in FIG. **2**A.
(7) FIG. **2**E is a block diagram illustrating a configuration of a cloud according to Variation 1 of the video display system illustrated in FIG. **2**D.
(8) FIG. **2**F is a block diagram illustrating a configuration of a cloud according to Variation 2 of the video display system illustrated in FIG. **2**D.
(9) FIG. **3** is a schematic configuration diagram of a VR tourism system according to Example 1.
(10) FIG. **4** is a diagram illustrating an operation example of the VR tourism system according to Example 1.
(11) FIG. **5** is a block diagram illustrating a detailed configuration of the VR tourism system according to Example 1.
(12) FIG. **6** is a diagram illustrating an operation flow example of the VR tourism system according to Example 1.
(13) FIG. **7** is a diagram illustrating a specific configuration example of a VR system of the VR tourism system according to Example 1.
(14) FIG. **8** is a diagram illustrating a specific configuration example of a VR audio conference unit included in a guide's terminal of the VR tourism system according to Example 1.
(15) FIG. **9** is a schematic configuration diagram of a VR tourism system according to Variation 1 of Example 1.
(16) FIG. **10** is a schematic configuration diagram of a VR tourism system according to Variation 2 of Example 1.
(17) FIG. **11** is a diagram illustrating an operation example of a VR tourism system according to Example 2.
(18) FIG. **12** is a schematic configuration diagram of the VR tourism system according to Example 2.
(19) FIG. **13** is a diagram illustrating an operation flow example of the VR tourism system according to Example 2.
(20) FIG. **14** is a diagram in which a description of a problem (3) has been added to the VR tourism system according to the reference example illustrated in FIG. **1**A.
(21) FIG. **15** is a diagram illustrating an operation example of a VR tourism system according to Example 3.
(22) FIG. **16** is a block diagram illustrating a detailed configuration of the VR tourism system according to Example 3.
(23) FIG. **17** is a diagram illustrating an operation flow example of the VR tourism system according to Example 3.
(24) FIG. **18** is a block diagram illustrating a detailed configuration of a VR tourism system according to Variation 1 of Example 3.
(25) FIG. **19** is a diagram in which a description of a problem (**4**) has been added to the VR tourism system according to the reference example illustrated in FIG. **1**A.
(26) FIG. **20** is a diagram illustrating required specifications of a VR tourism system according to Example 4.
(27) FIG. **21** is a schematic configuration diagram of the VR tourism system according to Example 4.
(28) FIG. **22** is a diagram illustrating an example of a use case that is realized by the VR tourism system according to Example 4.
(29) FIG. **23** is a diagram illustrating an example of a field of view provided by a VR system in the VR tourism system according to Example 4.
(30) FIG. **24** is a block diagram illustrating a detailed configuration of the VR tourism system according to Example 4.
(31) FIG. **25** is a diagram illustrating an operation flow example of the VR tourism system according to Example 4.

(32) FIG. **26** is a schematic configuration diagram of a VR tourism system according to Variation 1 of Example 4.
(33) FIG. **27** is a diagram illustrating an example of a use case that is realized by the VR tourism system according to Variation 1 of Example 4.
(34) FIG. **28** is a diagram describing functions of an audio switcher included in the VR tourism system according to Variation 1 of Example 4.
(35) FIG. **29** is a block diagram illustrating a detailed configuration of the VR tourism system according to Variation 1 of Example 4.
(36) FIG. **30** is a diagram illustrating an operation flow example of the VR tourism system according to Variation 1 of Example 4.
(37) FIG. **31** is a schematic configuration diagram of a VR tourism system according to Variation 2 of Example 4.
(38) FIG. **32** is a diagram illustrating an example of a use case that is realized by the VR tourism system according to Variation 2 of Example 4.
(39) FIG. **33** is a diagram for describing detailed functions of a machine translator included in the VR tourism system according to Variation 2 of Example 4.
(40) FIG. **34** is a block diagram illustrating a detailed configuration of the VR tourism system according to Variation 2 of Example 4.
(41) FIG. **35** is a diagram illustrating an operation flow example of the VR tourism system according to Variation 2 of Example 4.

DESCRIPTION OF EMBODIMENTS

(42) (Knowledge Obtained by the Inventors)
(43) VR tourism services which realize virtual experiences such as going on a sightseeing tour, attending a trade show, making an inspection tour, going on a factory tour, visiting an art museum, a museum, a zoo, an aquarium, or the like without actually being on-site are gaining momentum.
(44) In a VR tourism service, it is important from the perspective of a tourism experience that a plurality of visitors use a VR system to participate in a VR space of a destination and listen to an explanation on the destination provided by a human (or avatar) tour guide (leader) or ask the guide questions as if on an actual sightseeing tour. Simply listening to an explanation provided by the guide in a one-sided manner is no different than viewing a tourism VR program on YouTube (registered trademark) or the like. It is difficult to charge for such a level of service due to a lack of appeal. What is crucially important to a VR tourism service is that an interactive trip experience involving listening to an explanation provided by a guide with expertise or an expert and having the guide or the expert answer questions be provided.
(45) Since participants in a VR tourism service are people with a wide range of experiences, ICT competence, characteristics, languages, and the like and include both young and old as well as foreigners, it is important to provide a service satisfying requirements such as those presented below.
(46) To this end, support including (1) a user interface that anybody can readily use, (2) coping with bad-mannered participants, (3) private conversations between friends, and (4) accommodating a plurality of languages and accommodating a plurality of guides is required.
(47) In order to solve each of the four problems described above, the VR tourism system according to the present disclosure can provide a VR tourism system in which anyone can readily participate by using a 360-degree video distribution system and a digital audio conference unit and realizing means that allows VR tourism participants and guides to respectively operate three states with a simple UI (user interface) constituted of one button. In other words, based on a VR tourism system that solves the problem described in (1) above, the problems described in (2) to (4) above have been solved by adding various additional functions to such a VR tourism system. Accordingly, since a service by a simple UI in which anybody from the elderly to children can participate without knowledge of ICT can be realized in VR tourism, VR tourism can be enjoyed just like real

sightseeing.
(48) Note that the VR tourism system according to the present disclosure need not necessarily solve all of the four problems described above and need only solve at least one of the problems (1) to (4) described above as a video display system in which anyone can readily participate.
(49) (VR Tourism System According to Reference Example)
(50) FIG. **1**A is a conceptual diagram of VR tourism system **650** according to a reference example which enables conversations with a guide. VR tourism system **650** according to the reference example enables a simulated tourism experience with a realistic sensation with respect to a location by sending, to respective VR users **10** to **13**, video and audio (ambient sound of the location, audio of guide **20**, and the like) obtained by photographing the location with a 360-degree camera. Note that a "VR user" may also be referred to as a "VR tourism user", a "participant", or simply a "user".
(51) In order to further improve the VR tourism experience, it is important that VR users **10** to **13** do not listen to an explanation provided by guide **20** in a one-sided manner but are capable of engaging in two-way conversations with guide **20** while wearing VR systems **600** to **630**. In consideration thereof, as illustrated in FIG. **1**A, VR tourism system **650** according to the reference example realizes a function of engaging in a conversation with other VR users **10** to **13** or engaging in a conversation with guide **20** even during VR tourism by appropriately combining VR audio conference unit **810** with 360-degree video distributor **820** in VR cloud **800**.
(52) FIG. **1**B is a block diagram illustrating a detailed configuration of VR tourism system **650** illustrated in FIG. **1**A. VR systems **600** and the like include VR audio conference unit **605** that enables an audio conversation during VR tourism. VR audio conference unit **605** is constituted of A/D converter **108***a* that converts an audio signal outputted from microphone **108** to digital audio data, audio compressor **108***b* that compresses the audio data, and muter **108***c* that controls whether or not to transmit the compressed audio data to VR cloud **800**.
(53) VR audio conference unit **810** included in VR cloud **800** includes audio decoders **314***a* to **314***d* that decode audio data transmitted from VR systems **600** and the like, audio decoder **316** that decodes compressed audio data transmitted from smartphone **710** used by guide **20**, audio mixer **313** that mixes the audio data from audio decoders **314***a* to **314***d* and the audio data from audio decoder **316** to generate composite audio data, and audio compressor **317** that compresses the mixed composite audio data and transmits the compressed composite audio data to smartphone **710** of guide **20**.
(54) 360-degree video distributor **820** included in VR cloud **800** includes AV demultiplexer **321** that receives a 360-degree video transmitted from observation system **700** and demultiplexes the 360-degree video into video data and audio data, audio decoder **322** that decodes the demultiplexed audio data, audio mixer **323** that mixes the decoded audio data and composite audio data sent from VR audio conference unit **810**, audio compressor **324** that compresses the mixed audio data, and AV compositor **325** that composites the compressed audio data and the video data demultiplexed by AV demultiplexer **321** and distributes as a 360-degree video to VR system **600** and the like.
(55) Smartphone **710** that is a guide's audio conference terminal has hardware and an application (APP) which function as VR audio conference unit **750** and, specifically, smartphone **710** is constituted of A/D converter **213***a* that converts an audio signal outputted from a microphone of headset **720** to digital audio data, audio compressor **213***b* that compresses the audio data, muter **213***c* that controls whether or not to transmit the compressed audio data to VR cloud **800**, audio decoder **214***a* that receives and decodes composite audio data transmitted from VR cloud **800**, and D/A converter **214***b* that converts the decoded composite audio data to an analog audio signal and outputs the analog audio signal to a loudspeaker of headset **720**.
(56) Observation system **700** includes capturing unit **202** that controls camera **203** for 360-degree photography and acquires signals from camera **203** and remote controller **204** and communicator **201** that transmits signals acquired by capturing unit **202** to VR cloud **800** as a 360-degree video.

(57) In this manner, in VR tourism system **650** according to the reference example, function additions (**1**) to (**3**) described below are performed in order to realize conversations between VR users **10** to **13** and guide **20** by combining a general videoconferencing system with the video distribution system including 360-degree video distributor **820**.
(58) (1) VR audio conference unit **605** for connecting to VR audio conference unit **810** of VR cloud **800** is added to VR systems **600** and the like.
(59) (2) Guide **20** is caused to use smartphone **710** that is a guide's audio conference terminal for connecting to VR audio conference unit **810** of VR cloud **800** from headset **720** mounted with a microphone, an earphone, or the like via an ICT device such as a smartphone.
(60) (3) Composite audio data obtained by mixing voices of VR users **10** and the like and guide **20** in VR audio conference unit **810** of VR cloud **800** is mixed with only audio data extracted by 360-degree video distributor **820** from 360-degree video data sent from the observation system and the mixed audio data is sent to VR system **600** or the like of each VR user **10** or the like.
(61) Note that a position of muter **108***c* is not limited to the illustrated position as long as audio captured by microphone **108** is muted before the audio is mixed by audio mixer **313**.
(62) For example, in VR audio conference unit **605** in FIG. **1**B, muter **108***c* may be placed between A/D converter **108***a* and audio compressor **108***b* or between microphone **108** and A/D converter **108***a*.
(63) Furthermore, a configuration may be adopted in which muter **108***c* is placed before audio decoders **314***a* to **314***d* (on an input side relative to audio decoders **314***a* to **314***d*) or between audio decoders **314***a* to **314***d* and audio mixer **313** of VR audio conference unit **810** in VR cloud **800**.
(64) (Problems in VR Tourism System According to Reference Example)
(65) In cases of videoconferencing systems such as Zoom (registered trademark) and Teams (registered trademark), since the videoconferencing systems are used for business and their users can be expected to have certain ICT skills, operations such as muting and un-muting can be performed by the users themselves. However, VR tourism users may possibly be users in a wide range of ages from the elderly to children, a wide variety of occupations, educational levels, and the like and all participants cannot be expected to be skilled in ICT. Therefore, problems such as those described below may possibly occur.
(66) In particular, when each VR user is not speaking, defects such as mixing of noise and, at the worst, howling or the like may occur unless the VR user performs muting using a mute function of his/her own VR system. However, it is conceivably difficult to have a VR user unaccustomed to videoconferencing systems such as Zoom (registered trademark) and Teams (registered trademark) perform a mute operation or learn how to perform the operation in a VR system.
(67) (Problems to be Solved)
(68) As described above, the VR tourism system according to the reference example has the following four problems (1) to (4) to be solved.
(69) (1) A simple user interface that enables diverse participants to use the VR tourism service must be provided.
(70) Unlike users of a videoconferencing system that is used for business, education, and the like, people of various age groups and levels of understanding of ICT skills may participate as VR tourism users. In addition, a field of view is blocked by entering a VR space while wearing VR goggles. Therefore, operations using a controller or the like need to be easy and a simple user interface that satisfies conditions such as those described below is required. It is also necessary that a user need not learn a concept of muting or learn how to perform a muting operation. It is also necessary that VR experience does not decline even when a person unable to learn how to perform an operation, a person having forgotten how to perform an operation, or a person who does not follow rules participates. Furthermore, it is important that a description of operations of the VR system can be readily provided before the VR experience.
(71) In addition, a main duty of guide **20** is to provide explanations and guide **20** is unable to

perform system operations in a same manner as a host of a videoconferencing system. Guide **20** requires an extremely simple user interface that enables guide **20** to focus on the duty of providing explanations.

(72) (2) Bad-mannered VR users who obstruct provision of an explanation by guide **20** by verbally abusive language, continuous questions, and the like must be eliminated. With a videoconferencing system, since a purpose of use is business, there is no need to consider bad-mannered participants. In addition, even when a problem occurs, a system manager can block an utterance by forced muting or the like. A VR tourism service requires a function which enables, when guide **20** encounters a problem, the problem to be solved (a conversation to be blocked) by a simple operation.

(73) (3) Private conversations by participants with traveling companions must be supported. In other words, free conversations within a group must be supported without obstructing provision of explanations by guide **20** and without the conversations being heard by participants belonging to other groups.

(74) (4) A plurality of languages and a plurality of guides must be accommodated with respect to participants in VR tourism in order to accommodate foreign travel and foreigners. In other words, in order to simultaneously support users who use a plurality of languages, a plurality of guides, simultaneous interpreters, machine translation, and the like must also be supported.

(75) Hereinafter, solutions to each of the four problems listed above will be described using an embodiment and examples. Note that the embodiment and the examples to be described below each present a specific example of the present disclosure. Numerical values, shapes, materials, constituent elements, the arrangement and connection of the constituent elements, steps, an order of the steps, and the like described in the following embodiment and the following examples are merely examples and are not intended to limit the present disclosure. Furthermore, the respective drawings are not necessarily precise illustrations. In the drawings, substantially same components will be denoted by same reference signs and redundant descriptions will be either omitted or simplified.

(76) [Embodiment]

(77) FIG. **2**A is a block diagram illustrating a configuration of video display system **1** according to the embodiment. Video display system **1** is a system that provides a service for experiencing VR (virtual reality) and includes VR systems **30***a* to **30***b* used by participants **10** to **13**, explainer terminal **40**, observation system **50**, and cloud **60**. VR systems **30***a* to **30***b*, explainer terminal **40**, and observation system **50** are connected to cloud **60** via a communication network.

(78) Each of VR systems **30***a* and **30***b* includes display unit **31** that displays a VR space that is a video for VR to participants **10** to **13** who participate in the experience and audio processor **32** that inputs and outputs audio from and to participants **10** to **13**.

(79) Explainer terminal **40** is a terminal that inputs and outputs audio of explainer **20** who provides explanations for the experience towards participants **10** to **13** in the VR space and includes explainer's input unit **41** that accepts an operation from explainer **20** indicating whether or not questions are to be accepted.

(80) Observation system **50** is a system that generates a 360-degree video by photographing the real world and transmitting the 360-degree video to video distributor **63** of cloud **60** and includes camera **51** and microphone **52** that picks up audio of explainer **20**.

(81) Cloud **60** refers to a computer on a communication network and includes video distributor **63** that distributes a 360-degree video for generating a VR space to VR systems **30***a* to **30***b*, audio conversation unit **61** that assists audio conversation between participants **10** to **13** and explainer **20** via VR systems **30***a* to **30***b* and explainer terminal **40**, and controller **62** that controls at least one of VR systems **30***a* to **30***b*, explainer terminal **40**, video distributor **63**, and audio conversation unit **61**.

(82) In this case, controller **62** controls VR systems **30***a* to **30***b* so as to manage an operation mode that selectively takes a first state in which questions from participants **10** to **13** to explainer **20** are

not allowed, a second state in which questions are allowed, and a third state in which a question is in progress, and causes display unit **31** to display information specifying the operation mode. More specifically, controller **62** controls the plurality of VR systems **30***a* to **30***b* so as to manage an operation mode corresponding to each of the plurality of VR systems **30***a* to **30***b* and to cause information specifying the operation mode to be displayed on display unit **31** of a corresponding VR system among VR systems **30***a* to **30***b*.

(83) Accordingly, each of participants **10** to **13** can immediately know whether his/her own state is the first state in which questions cannot be asked, the second state in which questions can be asked, or the third state in which a question is being asked based on information specifying an operation mode that is displayed on display unit **31**, an operation for asking explainer **20** a question is simplified, and the problem (1) (a simple user interface that enables diverse participants to use the VR tourism service must be provided) described above is solved.

(84) Note that video display system **1** does not necessarily need observation system **50**. Video distributor **63** of cloud **60** may read a 360-degree video created in advance by photography, CG, or the like from storage in which the 360-degree video had been stored and distribute the 360-degree video to VR systems **30***a* to **30***b*.

(85) In addition, controller **62** need not be provided in one computer that constitutes cloud **60** and all of or a part of controller **62** may be provided in other devices such as a plurality of computers, VR systems **30***a* to **30***b*, and explainer terminal **40**. In other words, controller **62** may be divided into a plurality of functional modules and provided by being distributed among a plurality of devices.

(86) When explainer's input unit **41** accepts an instruction to enter the first state or, in other words, a state of not accepting questions, controller **62** may control the plurality of VR systems **30***a* to **30***b* to display an image indicating the first state on display unit **31** of the plurality of VR systems **30***a* to **30***b* and to mute the first state or, in other words, audio input from the plurality of participants **10** to **13** but, on the other hand, when explainer's input unit **41** accepts an instruction to enter the second state or, in other words, a state of accepting questions, controller **62** may control the plurality of VR systems **30***a* to **30***b* to display an image indicating the second state on display unit **31** of the plurality of VR systems **30***a* to **30***b* to create the second state or, in other words, a state in which questions are allowed and to change audio input from the plurality of participants **10** to **13** to the first state or, in other words, to mute the audio input. Accordingly, explainer **20** can control whether or not to allow questions with respect to the plurality of participants **10** to **13** by a simple operation using explainer's input unit **41**.

(87) In addition, when participant's input unit **33** of any one of the plurality of VR systems **30***a* to **30***b* receives an operation indicating a request to ask a question and an operation mode of VR system **30***a* or the like corresponding to participant's input unit **33** having received the operation is the second state, controller **62** may control VR system **30***a* or the like to display information specifying the third state instead of the second state on display unit **31** and, at the same time, change the operation mode to the third state by un-muting audio input from the corresponding participant. Accordingly, participants **10** to **13** can ask explainer **20** questions by a simple operation using participant's input unit **33**.

(88) Furthermore, when controller **62** controls VR system **30***a* or the like so as to unmute audio input from participant **10** or the like or, in other words, create the third state, controller **62** may control VR system **30***a* or the like so as to display an image indicating the first state on display unit **31** and create the first state by muting audio input from a corresponding participant **13** or the like with respect to another VR system **30***b* or the like excluding VR system **30***a* or the like. Accordingly, when one participant asks explainer **20** a question, the other participants are prevented from presenting questions and the other participants can listen to a conversation between the one participant and explainer **20**.

(89) In this case, explainer's input unit **41** may be a single button for receiving an operation

indicating accepting questions and an operation indicating not accepting questions. Accordingly, explainer **20** can switch between a state of accepting questions and a state of not accepting questions by a simple operation using a single button.

(90) In a similar manner, participant's input unit **33** may be a single button for receiving an operation indicating a request to ask a question and indicating that a question is in progress and an operation indicating that a question is completed. Accordingly, participants **10** to **13** can start asking explainer **20** a question by a simple operation using a single button.

(91) In addition, in place of or in addition to explainer's input unit **41** of explainer terminal **40**, audio conversation unit **61** may assist audio conversation between participants **10** to **13** and explainer **20** using audio of explainer **20** acquired by microphone **52** of observation system **50**. Accordingly, explainer **20** can provide an explanation such as tourism guidance and engage in conversation including answering questions from participants **10** to **13** using microphone **52** of observation system **50**.

(92) FIG. **2**B is a block diagram illustrating a configuration of controller **62***a* according to Variation 1 of video display system **1** illustrated in FIG. **2**A. In the present variation, controller **62***a* includes blocking information **70** including permission/refusal information indicating whether or not to block a question to explainer **20** from each of the plurality of participants **10** to **13** and, based on blocking information **70**, with respect to participant **10** or the like indicated to be blocked in the permission/refusal information, controls VR system **30***a* or the like so that an image indicating the first state is displayed on display unit **31** of VR system **30***a* or the like corresponding to participant **10** or the like and the first state is created by muting audio input from participant **10** or the like. Accordingly, the problem (**2**) (bad-mannered users who obstruct provision of an explanation by guide **20** by verbally abusive language, continuous questions, and the like must be eliminated) described above is solved.

(93) FIG. **2**C is a block diagram illustrating a configuration of cloud **60***a* according to Variation 2 of video display system **1** illustrated in FIG. **2**A. Cloud **60***a* includes audio conversation unit **61**, controller **62***b*, video distributor **63**, and group audio conversation unit **64**. Group audio conversation unit **64** assists a group audio conversation among two or more participants **10** or the like selected from the plurality of participants **10** to **13**. Controller **62***b* includes group information **71** including affiliation information indicating whether or not each of the plurality of participants **10** to **13** belongs to a predetermined group and, based on group information **71**, controls group audio conversation unit **64** so as to assist group audio conversation only with respect to the plurality of participants **10** and the like that belong to a same group. Accordingly, the problem (**3**) (private conversations by participants with traveling companions must be supported) described above is solved.

(94) More specifically, controller **62***b* controls group audio conversation unit **64** so as to assist group audio conversation when the operation modes of VR systems **30***a* and the like corresponding to the plurality of participants **10** and the like belonging to the same group are all the first state or the second state.

(95) When the operation mode of VR systems **30***a* or the like corresponding to any one of participants **10** or the like belonging to the same group makes a transition from the second state to the third state, controller **62***b* controls VR systems **30***a* to **30***b* so as to stop assisting the group audio conversation and, for each of other participants **13** and the like excluding participant **10** or the like, causes display unit **31** of corresponding VR system **30***b* or the like to display an image indicating the first state and mute audio input from participant **13** and the like. Accordingly, when one participant starts to ask explainer **20** a question during a group conversation, the other participants can listen to the question.

(96) In addition, while assisting the group audio conversation, controller **62***b* may control a plurality of VR systems **30***a* and the like that correspond to a plurality of participants **10** and the like who belong to a same group so as to adjust a volume of at least one of audio from explainer **20**

to the plurality of participants **10** and the like belonging to the same group and audio of the group audio conversation. Accordingly, the participants of a group audio conversation can listen to the group audio conversation and to an explanation provided by explainer **20** in a state where there is a mixture of the group audio conversation and the explanation.

(97) FIG. **2**D is a block diagram illustrating a configuration of video display system **1***a* according to Variation 3 of video display system **1** illustrated in FIG. **2**A. Video display system **1***a* includes, in video display system **1** illustrated in FIG. **2**A, first explainer terminal **40***a* and second explainer terminal **40***b* instead of explainer terminal **40** and cloud **60***b* instead of cloud **60**.

(98) First explainer terminal **40***a* is a terminal that inputs and outputs audio to and from first explainer **20***a* who provides explanations in a first language. Second explainer terminal **40***b* is a terminal that inputs and outputs audio to and from second explainer **20***b* who provides explanations in a second language.

(99) Cloud **60***b* includes audio conversation unit **61**, controller **62***c*, and video distributor **63**. Audio conversation unit **61** includes first audio conversation unit **61***a* that assists an audio conversation between participants **10** to **13** and first explainer **20***a* via the plurality of VR systems **30***a* to **30***b* and first explainer terminal **40***a* and second audio conversation unit **61***b* that assists an audio conversation between participants **10** to **13** and second explainer **20***b* via the plurality of VR systems **30***a* to **30***b* and second explainer terminal **40***b*.

(100) Controller **62***c* includes language information **72** that associates each of the plurality of participants **10** to **13** with a desired language of the provided explanation and controls first audio conversation unit **61***a* and second audio conversation unit **61***b* so that, based on language information **72**, with respect to participant **10** or the like associated with the first language, an audio conversation between participant **10** or the like and first explainer **20***a* is assisted by first audio conversation unit **61***a* and, with respect to participant **13** or the like associated with the second language, an audio conversation between participant **13** or the like and second explainer **20***b* is assisted by second audio conversation unit **61***b*. Accordingly, the problem (**4**) (a plurality of languages and a plurality of guides must be accommodated with respect to participants in VR tourism in order to accommodate foreign travel and foreigners) described above is solved.

(101) Note that second explainer **20***b* may be a simultaneous interpreter who interprets between the first language and the second language. In such a case, first audio conversation unit **61***a* also outputs audio from first explainer **20***a* to second explainer **20***b*. Accordingly, a video display system that also accommodates cases including a simultaneous interpreter is realized.

(102) FIG. **2**E is a block diagram illustrating a configuration of cloud **60***c* according to Variation 1 of video display system **1***a* illustrated in FIG. **2**D. Cloud **60***c* includes audio conversation unit **61**, controller **62***c*, video distributor **63**, and audio switcher **65**. Audio switcher **65** switches between outputting audio from a simultaneous interpreter to participant **10** or the like associated with the second language and outputting audio to first explainer **20***a* and participant **13** or the like associated with the first language. Accordingly, when second explainer **20***b* is a simultaneous interpreter, the simultaneous interpreter can switch between speaking to a participant and speaking to first explainer **20***a* who speaks the first language and convenience is improved.

(103) FIG. **2**F is a block diagram illustrating a configuration of cloud **60***d* according to Variation 2 of video display system **1***a* illustrated in FIG. **2**D. Cloud **60***d* includes audio conversation unit **61**, controller **62***d*, video distributor **63**, and machine translators **66***a* to **66***b*. Machine translators **66***a* to **66***b* perform machine translation between two different languages (such as the first language and the second language).

(104) Controller **62***d* includes language information **72** that associates each of the plurality of participants **10** to **13** with a desired language of the provided explanation and controls machine translators **66***a* and the like so that, based on language information **72**, with respect to participant **10** or the like associated with the first language, participant **10** or the like and explainer **20** engage in an audio conversation without involving machine translators **66***a* to **66***b* and, with respect to

participant **13** or the like associated with the second language, participant **13** or the like and explainer **20** engage in an audio conversation through machine translators **66***a* and the like. Accordingly, a plurality of languages can be accommodated due to machine translation.

(105) In addition, controller **62** may include machine translation management information **73** indicating two languages handled by the plurality of machine translators **66***a* to **66***b* and, based on language information **72** and machine translation management information **73**, controller **62** may control the plurality of machine translators **66***a* to **66***b* such that for each of participants **10** to **13**, a machine translator that translates between a language associated with participants **10** to **13** and the first language used by the guide is selected from among the plurality of machine translators **66***a* to **66***b* and participant **10** to **13** and explainer **20** engage in an audio conversation via the machine translator selected from machine translators **66***a* to **66***b*. Accordingly, by accommodating a plurality of different kinds of machine translation, an extremely large number of languages can be accommodated.

(106) Moreover, as will be illustrated in operation flow examples of examples to be described later, a video display method according to the present disclosure is a video display method by video display system **1** that provides a service of experiencing VR (virtual reality), the video display method including: controlling VR systems **30***a* to **30***b* so as to manage an operation mode that selectively assumes a first state in which questions from participants **10** to **13** to explainer **20** are not allowed, a second state in which the questions are allowed, and a third state in which a question is in progress and cause display unit **31** to display information specifying the operation mode (FIG. **6**). More specifically, in the controlling of VR systems **30***a* to **30***b*, the plurality of VR systems **30***a* to **30***b* are controlled so as to manage an operation mode corresponding to each of the plurality of VR systems **30***a* to **30***b* and to cause information specifying the operation mode to be displayed on display unit **31** of a corresponding VR system among VR systems **30***a* to **30***b* (FIG. **6**, FIG. **2**A).

(107) Accordingly, each of participants **10** to **13** can immediately know whether his/her own state is the first state in which questions cannot be asked, the second state in which questions can be asked, or the third state in which a question is being asked based on information displayed on display unit **31** that specifies an operation mode, an operation for asking explainer **20** a question is simplified, and the problem (1) (a simple user interface that enables diverse participants to use the VR tourism service must be provided) described above is solved.

(108) In addition, in the controlling of VR systems **30***a* to **30***b*, VR systems **30***a* to **30***b* are controlled so that, based on blocking information **70** including permission/refusal information indicating whether or not to block a question to explainer **20** from each of the plurality of participants **10** to **13**, with respect to participants **10** to **13** indicated to be blocked in the permission/refusal information, an image indicating the first state is displayed on display unit **31** of VR systems **30***a* to **30***b* corresponding to participants **10** to **13** and the first state is created by muting audio input from participants **10** to **13** (FIG. **13**, FIG. **2**B). Accordingly, the problem (**2**) (bad-mannered users who obstruct provision of explanations by guide **20** by verbally abusive language, continuous questions, and the like must be eliminated) described above is solved.

(109) In addition, the controlling of VR systems **30***a* to **30***b* includes group information **71** including affiliation information indicating whether or not each of the plurality of participants **10** to **13** belongs to a predetermined group and, based on group information **71**, group audio conversation unit **64** is controlled so as to assist group audio conversation with respect to the plurality of participants **10** to **13** that belong to a same group (FIG. **13**, FIG. **2**C). Accordingly, the problem (3) (private conversations by participants with traveling companions must be supported) described above is solved.

(110) In addition, in the controlling of VR systems **30***a* to **30***b*, based on language information **72** that associates each of the plurality of participants **10** to **13** with a desired language of the provided explanation, first audio conversation unit **61***a* and second audio conversation unit **61***b* are controlled so that with respect to participants **10** to **13** associated with the first language, an audio

conversation between participants **10** to **13** and first explainer **20***a* is assisted by first audio conversation unit **61***a* and, with respect to participants **10** to **13** associated with the second language, an audio conversation between participants **10** to **13** and second explainer **20***b* is assisted by second audio conversation unit **61***b* (FIG. **25**, FIG. **2**D). Accordingly, the problem (4) (a plurality of languages and a plurality of guides must be accommodated with respect to participants in VR tourism in order to accommodate foreign travel and foreigners) described above is solved.

(111) In addition, in the controlling of VR systems **30***a* to **30***b*, based on language information **72** that associates each of the plurality of participants **10** to **13** with a desired language of the provided explanation, machine translators **66***a* to **66***b* are controlled so that, with respect to participants **10** to **13** associated with the first language, participants **10** to **13** and explainer **20** engage in an audio conversation without involving machine translators **66***a* to **66***b* and, with respect to participants **10** to **13** associated with the second language, participants **10** to **13** and explainer **20** engage in an audio conversation through machine translators **66***a* to **66***b* (FIG. **35**, FIG. **2**F). Accordingly, the problem (4) (a plurality of languages and a plurality of guides must be accommodated with respect to participants in VR tourism in order to accommodate foreign travel and foreigners) described above is solved.

(112) Hereinafter, as specific examples of the embodiment, first to fourth examples that solve the problems (**1**) to (**4**) described above will be described. Every example will be described as an example of applying the video display system according to the embodiment to a VR tourism system.

Example 1

(113) First, Example 1 will be described as a specific example of solving the problem (1) (a simple user interface that enables diverse participants to use the VR tourism service must be provided) described above.

(114) FIG. **3** is a schematic configuration diagram of VR tourism system **2** according to Example 1. VR tourism system **2** is constituted of: A) VR systems **100**, **110**, **120**, and **130** for VR users **10** to **13** to experience a VR tourism service; B) 360-degree video distributor **320** which is provided in VR cloud **300** and which distributes a 360-degree video for generating a VR space inside VR systems **100**, **110**, **120**, and **130**; C) VR audio conference unit **310** which is provided in VR cloud **300** and which realizes an audio conversation between each of VR systems **100**, **110**, **120**, and **130** and guide **20**; and D) guide's terminal **210** or the like constituted of smartphone **210**, headset **220**, and guide's remote controller **230** for guide **20** to engage in audio conversation with VR users **10** to **13**.

(115) More specifically, VR system **100** (**110**, **120**, and **130**) includes display **101** (**111**, **121**, and **131**), input unit **102** (**112**, **122**, and **132**) that accepts operations, communicator **104** (**114**, **124**, and **134**) that communicates with the VR cloud, and VR space generator **103** (**113**, **123**, and **133**) that generates a VR space to be displayed on display **101** (**111**, **121**, and **131**). VR space generator **103** (**113**, **123**, and **133**) and display **101** (**111**, **121**, and **131**) are examples of display unit **31** according to the embodiment and input unit **102** (**112**, **122**, and **132**) is an example of participant's input unit **33** according to the embodiment. Note that illustration of audio processor **32** according to the embodiment is omitted in the present schematic configuration diagram.

(116) VR cloud **300** includes VR audio conference unit **310** including conversation controller **311** and audio processor **312** and 360-degree video distributor **320**. VR audio conference unit **310** is an example of audio conversation unit **61** according to the embodiment, 360-degree video distributor **320** is an example of video distributor **63** according to the embodiment, and conversation controller **311** is an example of controller **62** according to the embodiment.

(117) Observation system **200** includes communicator **201**, capturing unit **202**, camera **203**, remote controller **204**, and microphone **205**. Camera **203** is an example of camera **51** according to the embodiment, and microphone **205** is an example of microphone **52** according to the embodiment.

(118) Guide's terminal **210** or the like is an example of explainer terminal **40** according to the

embodiment and is constituted of smartphone **210**, headset **220**, and guide's remote controller **230** that is an example of explainer's input unit **41** according to the embodiment. Guide instruction generator **211** is a function of acquiring an instruction of guide **20** from guide's remote controller **230** and outputting the instruction to VR audio conference unit **310** and is an example of the function of acquiring an instruction of guide **20** from explainer's input unit **41** among functions of controller **62** according to the embodiment.

(119) While participants can speak freely as a general rule in a general audio conference system, since VR tourism system **2** is for VR tourism, by having VR users **10** to **13** normally listen to explanations provided by guide **20** and enabling VR users **10** to **13** to speak (ask a question) only when permitted by guide **20** instead of allowing participants to speak freely, both VR users **10** to **13** and guide **20** can experience VR tourism with a simple user interface.

(120) To this end, audio/display control (mute function, guidance display, and the like) of VR systems **100**, **110**, **120**, and **130** of respective users **10** to **13** is realized by having guide **20** use guide instruction generator **211** in guide's terminal **210** or the like to operate conversation controller **311** in VR cloud **300**.

(121) FIG. **4** is a diagram illustrating an operation example of VR tourism system **2** according to Example 1. More specifically, (a) in FIG. **4** illustrates a display example in VR systems **100**, **110**, **120**, and **130**, display examples **240***a* and **240***b* using an audio control application in smartphone **210** of guide **20**, an operation example of guide's remote controller **230**, and an operation example of VR remote controller **106** by VR user **10** or the like.

(122) In FIG. **4**, (b) illustrates operation mode explanation table **410** indicating a management example of operation modes by conversation controller **311**. In other words, when “guide's instruction” is “questions not allowed”, “questions not allowed” **400***a* is displayed at bottom right of screen display example **400** of the VR system (“display state of VR” is display mode of “questions not allowed”) and the VR user becomes muted (“mute function of VR system” becomes “muted” or, in other words, the first state) while, on the other hand, when “guide's instruction” is “questions allowed”, the VR user becomes muted (“mute function of VR system” becomes “muted”) when “questions allowed” **401***a* is displayed at bottom right of screen display example **401** of the VR system (“display state of VR” is display mode of “questions allowed” or, in other words, the second state) but the VR user becomes unmuted (“mute function of VR system” becomes “unmuted”) when “question in progress” **402***a* is displayed at bottom right of screen display example **402** of the VR system (“display state of VR” is display mode of “question in progress” or, in other words, the third state).

(123) As illustrated in the present drawing, by realizing three guidance display modes in VR systems **100**, **110**, **120**, and **130** and transitions of display modes with guide **20** and VR users **10** and the like using a simple UI constituted of a single button, the following four consequences are realized. (1) Basically, since utterances of VR users **10** to **13** are to be constantly muted, there is no need for VR users **10** to **13** to learn a concept of muting or how to perform a muting operation. (2) VR users **10** to **13** can readily understand when questions can be asked and when questions cannot be asked by a guidance display in VR space (transition of guidance display of “questions allowed” and “questions not allowed”). (3) When VR users **10** to **13** wish to ask a question (wish to speak to guide **20**), pushing one button (question button) when guidance of “questions allowed” is being displayed will suffice. Therefore, since there is little to learn, there is little to forget. It is important to be aware that keeping operations simple is essential because a field of view is to be blocked when wearing the VR system. (4) When guide **20** does not want to take questions (in other words, when guide **20** does not want to be disturbed when providing an explanation), guide **20** can set “questions not allowed” with respect to VR users **10** to **13** at any time only by an operation of a “questions not allowed” instruction (even when a question is in progress). In addition, when accepting questions, “questions allowed” can be set with respect to VR users **10** to **13** only by an operation of a “questions allowed” instruction. Since both operations can be performed by simple

operations of a single button such as a toggle button, guide **20** can focus on providing explanations.
(124) From the features described above, A) VR users **10** to **13** can readily enjoy conversation with guide **20** with one button operation. B) Guide **20** can readily control VR systems **100**, **110**, **120**, and **130** with one button operation and smoothly provide explanations without being disturbed by VR users **10** to **13**.
(125) FIG. **5** is a block diagram illustrating a detailed configuration of VR tourism system **2** according to Example 1. As VR tourism system **2**, in the configuration example of VR tourism system **650** according to the reference example illustrated in FIG. **1**B, conversation controller **311** and guide instruction recorder **315** are added to VR audio conference unit **310** of VR cloud **300**, conversation controller **107** and guidance display controller **109** are added to VR audio conference unit **105** of VR systems **100**, **110**, **120**, and **130**, and input unit **212** and guide instruction generator **211** are added to VR audio conference unit **250** of smartphone **210** that is a guide's terminal.
(126) In other words, input unit **212** that accepts input by a user and guide instruction generator **211** that conveys, based on the input, instruction contents of guide **20** to VR audio conference unit **310** in VR cloud **300** are included in VR audio conference unit **250** in guide's terminal **210** or the like. In addition, VR cloud **300** includes conversation controller **107** which receives an instruction of guide **20** sent from guide's terminal **210** or the like, which records contents of the instruction in guide instruction recorder **315**, which generates a control instruction for controlling VR audio conference unit **105** of VR systems **100**, **110**, **120**, and **130**, and which transmits the generated control instruction to VR systems **100**, **110**, **120**, and **130**.
(127) Furthermore, VR audio conference unit **105** of VR systems **100**, **110**, **120**, and **130** includes conversation controller **107** which is responsible for setting a mute state of muter **18***c* according to contents of a control instruction sent from VR cloud **300** and user input and changing a guidance display state such as “questions allowed” by issuing an instruction to guidance display controller **109**.
(128) Such a configuration realizes functions illustrated in FIG. **4** as an algorithm of the operation flow example of VR tourism system **2** according to Example 1 illustrated in FIG. **6** described below is executed.
(129) FIG. **6** is a diagram illustrating an operation flow example of VR tourism system **2** (in other words, a specific example of a video display method) according to Example 1. More specifically, (a) in FIG. **6** illustrates an operation flow of VR systems **100**, **110**, **120**, and **130**, (b) in FIG. **6** illustrates same operation mode explanation table **410** as (b) in FIG. **4** for reference, and (c) in FIG. **6** illustrates an operation flow of VR cloud **300**.
(130) As illustrated in (c) in FIG. **6**, VR cloud **300** is capable of accepting a “guide's instruction” (as transition of operation modes, a transition to “questions allowed” and a transition to “questions not allowed”) from an APP of smartphone **210** or from guide's remote controller **230** or the like via input unit **212** and guide instruction generator **211** of guide's terminal **210** or the like (S**10**).
(131) In addition, conversation controller **311** determines the accepted “guide's instruction” (S**11**) and sorts instructions into the following two types of processing. Specifically, when the “guide's instruction” is “questions allowed” (Y in S**11**), the instruction is set to “questions allowed” (S**13**), and when the “guide's instruction” is “questions not allowed” (N in S**11**), the instruction is set to “questions not allowed” (S**12**).
(132) In addition, conversation controller **311** notifies all VR systems **100**, **110**, **120**, and **130** that guide **20** has issued a new instruction together with instruction contents (S**14**) and returns to step S**10**.
(133) On the other hand, while each VR system **100**, **110**, **120**, or **130** performs main processing of a VR tourism distribution service, when there are the following two types of interrupt processing (S**30** to S**40** and S**20** to S**24**) as illustrated in (a) in FIG. **6**, the interrupt processing is performed before returning to the main processing. If there is no interrupt processing, reception processing in the VR tourism service is continued until the VR tourism distribution service ends.

(134) Note that the main processing of VR systems **100**, **110**, **120**, and **130** refers to processing in which VR systems **100**, **110**, **120**, and **130** provide VR users **10** to **13** with a VR space for VR tourism and is processing involving receiving a 360-degree video sent from 360-degree video distributor **320**, demultiplexing the received 360-degree video into video data and audio data, and after decoding the demultiplexed audio data, performing audio processing dependent on a position and an azimuth of VR observation system **200** and outputting to a loudspeaker as audio while, on the other hand, after decoding the demultiplexed video data, performing mapping on a 360-degree spherical video, further performing video segmentation dependent on a position and an azimuth of VR observation system **200**, and outputting as a video to a display.
(135) A first type of interrupt processing is user input interrupt processing of VR systems **100**, **110**, **120**, and **130**. Conversation controller **107** receives a VR user input from VR remote controller **106** or the like (S**30**), and when the received VR user input is a "question in progress" request (Y in S**31**), conversation controller **107** refers to information in guide instruction recorder **315** (S**33**).
(136) As a result, when a value of the guide's instruction is "questions not allowed" or, in other words, the first state (N in S**35**), the processing is ended, but when the value of the guide's instruction is "questions allowed" (Y in S**35**) and the display mode is "questions allowed" or, in other words, the second state (N in S**36**), guidance display controller **109** changes the display mode to "question in progress" (S**37**), muter **108***c* sets unmute (S**38**) or, in other words, changes to the third state, and ends processing.
(137) On the other hand, when the value of the guide's instruction is "questions allowed" (Y in S**35**) and the display mode is "question in progress" or, in other words, the third state (Y in S**36**), guidance display controller **109** changes the display mode to "questions allowed" (S**39**), muter **108***c* sets to "mute" or, in other words, the second state (S**40**), and ends processing.
(138) Note that when the VR user input is other than a "question in progress" request (N in S**31**), conversation controller **107** processes the VR user input (S**32**) and ends processing.
(139) A second type of interrupt processing is interrupt processing from VR cloud **300**. Conversation controller **311** records the guide instruction received from VR cloud **300** in guide instruction recorder **315**.
(140) In addition, when the guide instruction is "questions allowed" (Y in S**21**), guidance display controller **109** is caused to change the display mode to "questions allowed" or, in other words, the second state (S**23**) and the processing is ended. On the other hand, when the guide instruction is "questions not allowed" (N in S**21**), guidance display controller **109** changes the display mode to "questions not allowed" (S**22**), muter **108***c* sets to "mute" (S**24**) or, in other words, the first state, and ends processing.
(141) FIG. **7** is a diagram illustrating a specific configuration example of VR systems **100**, **110**, **120**, and **130** of VR tourism system **2** according to Example 1. In the present configuration example, VR systems **100**, **110**, **120**, and **130** are constituted of a computer or a smartphone (computer/smartphone **160**) and an HMD (head-mounted display) or VR glasses (HMD/VR glasses **140**) connected thereto. Instead of the present configuration example, VR systems **100**, **110**, **120**, and **130** may be solely constituted of HMD/VR glasses **140**. In such a case, functions of a CPU and a GPU of both components are integrated and peripheral functions are also consolidated.
(142) As main components, computer/smartphone **160** is constituted of: high-speed communication element **163** that supports WiFi (registered trademark) or Ethernet (registered trademark) for connecting to VR systems **100**, **110**, **120**, and **130**; GPU (Graphics Processing Unit) **165** that mainly performs processing of video data and graphics; CPU (Central Processing Unit) **170** that performs general data processing and control of entire computer/smartphone **160**; non-volatile memory **167** that is a hard disk, a flash memory, or the like for storing a program necessary for running CPU **170** and GPU **165**; RAM **166** used to store data necessary for running CPU **170** and GPU **165**; power supply control element **169** for supplying power to power switch **168** and the respective units; AV output terminal **161** for outputting video and audio signals to HMD/VR

glasses **140**; an I/F such as USB (Universal Serial Bus) for controlling HMD/VR glasses **140** and acquiring data therefrom; a memory bus that connects RAM **166** and non-volatile memory **167** and enables access by CPU **170** and GPU **165**; a system bus that enables CPU **170** and GPU **165** to access AV output terminal **161**, USB **162**, and communication element **163**; bus converter **164** that connects the system bus and the memory bus to each other; a display device that is not illustrated; an input device for performing operations; other general-purpose I/Fs (interfaces), and the like.
(143) As functions exercised by executing the program, CPU **170** includes: multiplexer **170***a* that multiplexes video data and audio data; demultiplexer **170***b* that demultiplexes video data and audio data from a received 360-degree video; audio decoder **170***c* that decodes demultiplexed audio data; and audio playback controller **170***d* that controls playback of decoded audio data.
(144) As functions exercised by executing the program, GPU **165** includes: motion/position detector **165***a* that receives motion/position data generated by motion/position detector **165***a* of HMD/VR glasses **140** and detects a motion and a position of a VR user; VR controller **165***b* that issues a generation instruction of a VR space based on the detected motion and position of the VR user; VR video decoder **165***c* that decodes video data demultiplexed by CPU **170**; guidance display generator **165***d* that instructs display and generation of guidance such as “questions not allowed”, “questions allowed”, and “question in progress”; graphics generator **165***e* that generates graphics of a guidance based on the instruction; and VR display controller **165***f* that composites video data decoded by VR video decoder **165***c* and graphics generated by the graphics generator based on the generation instruction of a VR space from VR controller **165***b* and outputs the composite video data/graphics as a VR video to HMD/VR glasses **140**.
(145) While there are cases that differ from the present example in terms of some types of processing being performed by GPU **165** or CPU **170** and also in terms of bus configurations, there is no difference in functional configurations and operations. In addition, AV output terminal **161** and USB **162** may be replaced with I/Fs such as USB_Type C (registered trademark) as high-speed two-way I/Fs. In such a case, HMD/VR glasses **140** are to be connected by a same I/F or connected by a converter that converts the I/F. Generally, when sending a video by USB **162**, since a data amount is compressed by suitable compression, suitable video compression is performed by CPU **170** or GPU **165** and a VR video is sent to HMD/VR glasses **140** via USB **162**.
(146) On the other hand, as main components, HMD/VR glasses **140** in VR systems **100**, **110**, **120**, and **130** include: an audio input unit constituted of microphone **157***a* for inputting audio, microphone amplifier **157***b*, and ADC (A/D converter) **157***c*; an audio output unit constituted of loudspeaker **158***c*, headphone terminal **158***d*, amplifier **158***b*, and DAC (D/A converter) **158***a*; a VR display unit constituted of two sets of lenses **153***a* and **153***b* for a user to view VR video and display elements **152***a* and **152***b*; motion/position sensor **141** constituted of a motion/position detector and an azimuth detector constituted of a gyro sensor, a camera, an ultrasonic microphone, or the like; wireless communication element **148** such as Bluetooth (registered trademark) for communicating with a controller (not illustrated); volume button **142** for controlling output volume from the audio output unit; power switch **143** for turning on/off power of HMD/VR glasses **140**; power supply control element **145** for power supply control; a memory bus that connects EEPROM **154**, RAM **155**, and an SD card (registered trademark) with GPU **151** and CPU **156** and performs exchange of data with the memories; AV input terminal **146** for receiving video signals and audio signals from CPU **156**, GPU **151**, wireless communication element **148**, and computer/smartphone **160**; an I/F such as USB **147** for receiving a control signal from computer/smartphone **160** and sending video, audio signals, and data of motion/positions; CPU **156** that mainly performs control of audio compression (audio compressor **156***a*), switches, and power and performs control of entire HMD/VR glasses **140**; GPU **151** that includes video display processor **151***b* that mainly adjusts video to the VR display unit and motion/position detector **151***a* that corrects and shapes motion/position information to be sent to computer/smartphone **160** from information from motion/position sensor **141**; EEPROM **154** for storing programs and data that enable CPU **156** and

GPU **151** to run; RAM **155** for storing data while CPU **156** and GPU **151** are running; a memory bus for connecting CPU **156**, GPU **151**, RAM **155**, and EEPROM **154**; a system bus to which CPU **156**, GPU **151**, USB **147**, the audio input unit, the audio output unit, and wireless communication element **148** are connected and which performs control and exchange of data; an I/O bus that performs control and low-speed exchange of data including the buttons described earlier, power supply control element **145**, motion/position sensor **141** and, although not illustrated, the audio input unit, the audio output unit, a VR photography camera, and the like; and several bus converters **150** that connect the respective buses to each other.

(147) Furthermore, HMD/VR glasses **140** are configured to be connectible to VR remote controller **106** via BLE (Bluetooth Low Energy; registered trademark) **149** and enable an operation to request a "question" when VR users **10** to **13** wish to engage in a conversation with guide **20**.

(148) While there are cases that differ from the present example in terms of some types of processing being performed by GPU **151** or CPU **156** and also in terms of bus configurations, there is no difference in functional configurations and operations.

(149) In addition, since video data from AV input terminal **146** has a large data amount and is high-speed, the video data is illustrated as being directly loaded into GPU **151** when the system bus lacks sufficient speed.

(150) Furthermore, video information photographed by the camera included in motion/position sensor **141** may be sent to display elements **152***a* and **152***b* as information used by a VR user to check a periphery of HMD/VR glasses **140** or sent to computer/smartphone **160** through USB **147** to monitor whether a user is not in a dangerous situation.

(151) In addition, power supply control element **145** receives power supply from USB **147** or AV input terminal **146**, performs stabilization of voltage, management of battery capacity, and the like and, although not illustrated, supplies power to all constituent elements. In some cases, battery **144** may be provided inside or outside and battery **144** may be connected to power supply control element **145**.

(152) A state of a button or a cursor of controllers (not illustrated) is acquired by CPU **156** through wireless communication element **148** and used to perform a button operation, a movement, or an application operation in VR space. A position and an orientation of the controllers are detected by a camera or an ultrasonic sensor included in motion/position sensor **141** and, after being subjected to suitable processing by motion/position sensor **141**, used for control by CPU **156** and, at the same time, sent to computer/smartphone **160** via USB **147** to be used in a program executed by CPU **156** or used in rendering of graphics and image processing executed by GPU **151**.

(153) FIG. **8** is a diagram illustrating a specific configuration example of VR audio conference unit **250** included in guide's terminal **210** or the like of VR tourism system **2** according to Example 1. VR audio conference unit **250** includes: communicating means with VR cloud **300** (communicating means via a terminal having a communication function of using carrier communication such as 5G or Wi-Fi (registered trademark) to communicate with VR cloud **300** such as a PC or smartphone **210**); audio interface **215** for connecting to external devices that perform audio input/output such as microphone **216** and loudspeaker **217**; A/D converter **213***a* and D/A converter **214***b* which convert analog audio into digital data or reverse processing thereof; audio compressor **213***b* and audio decoder **214***a* for compressing and decoding digital audio data; muter **213***c* for temporarily preventing an audio signal from microphone **216** from being sent; and guide instruction generator **211** that converts an input into a guide instruction and sends the guide instruction to VR cloud **300**.

(154) Furthermore, guide's terminal **210** or the like includes communicator/CODEC for headset **211***a* which performs power-saving communication such as BLE (registered trademark) with external headset **220** and guide's remote controller **230** or the like and input processor **211***b* that issues an input instruction according to the communication and outputs the input instruction to guide instruction generator **211**.

(155) While a dedicated terminal may be used as guide's terminal **210** or the like, since guide's

terminal **210** or the like can be readily implemented with smartphone **210** and an APP of smartphone **210**, guide's terminal **210** or the like may be implemented as an APP on smartphone **210** (business or private use) in the possession of guide **20**. However, using guide's remote controller **230** connected by low-power consumption communication such as BLE (registered trademark) of smartphone **210** instead of operating smartphone **210** is more preferable since operations are simple and the fact that an operation is being performed can be hidden from VR users **10** to **13**.

(156) Using guide's remote controller **230** enables operations to be performed by simply blind-pushing a button on guide's remote controller **230** being hand-held even when an explanation is being provided.

(157) As described above, due to VR tourism system **2** according to Example 1, the simple user interface illustrated in FIG. **4** is realized and the problem (1) described earlier is solved.

Variation 1 of Example 1

(158) Next, Variation 1 of Example 1 will be described.

(159) FIG. **9** is a schematic configuration diagram of VR tourism system **2***a* according to Variation 1 of Example 1. VR tourism system **2***a* is a system that is VR tourism system **2** according to Example 1 being applied to a VR tourism system with a "VR sickness prevention function" and to a VR tourism system with a "lost person prevention function".

(160) In this case, a VR tourism system with a "VR sickness prevention function" is a VR tourism system with the following functions. Specifically, in order to avoid VR sickness that accompanies a movement of a 360-degree camera used to take photos in VR tourism or the like, a VR tourism system with a "VR sickness prevention function" has a function of avoiding (reducing) VR sickness by sending metadata (a movement of a camera that photographs a 360-degree video, a time of day of start of panning, a movement direction, or the like) in addition to the 360-degree video from a VR observation system to a VR system, generating a visual effect (a display on a screen or the like) or a non-visual effect (a sound, vibration of a controller, or the like) which appropriately notifies a viewer of a movement immediately before a camera movement or during a movement period in the VR system, and displaying an unconventional visual effect video or the like to prompt the viewer to take a precaution or to prevent the viewer from becoming sick.

(161) In addition, a VR tourism system with a "lost person prevention function" is a VR tourism system with the following functions. Specifically, a VR tourism system with a "lost person prevention function" has a function of preventing a user from getting lost by sending, with respect to a VR user, metadata including a trigger or the like that is generated by a tour guide (leader, explainer) to a VR system and presenting a visual guidance of a position of the guide or a visual guidance indicating a position in a 3D-space of an object designated (being explained) by the guide in the form of a video, audio, vibration, or the like.

(162) VR tourism system **2***a* according to the present variation includes VR systems **100**, **110**, **120**, and **130**, VR cloud **300***a*, observation system **200***a*, and guide's terminals (smartphone **210**, guide's remote controller **230**).

(163) Guide's terminal **210** and the like respectively send acquired pieces of metadata additional information **219***a* and **219***b* to VR cloud **300***a* and observation system **200***a*. Observation system **200***a* includes camera **203**, remote controller **204**, capturing unit **202**, and communicator **201** mounted to vehicle **206** for acquiring a 360-degree video and transmits metadata additional information **219***b* received from guide's terminal **210** and the like and a 360-degree video to VR cloud **300***a*. VR cloud **300***a* includes 360-degree video distributor **320***a* that distributes metadata additional information **219***a* received from guide's terminal **210** and the like and the 360-degree video received from observation system **200***a* to VR systems **100**, **110**, **120**, and **130**. In VR systems **100**, **110**, **120**, and **130**, VR space generator **103** exercises the "VR sickness prevention function" and the "lost person prevention function" by changing displays according to the metadata received from VR cloud **300***a*.

(164) In essence, VR tourism system **2***a* according to the present variation acquires additional information to form a basis of metadata by various methods (a movement of a camera that photographs a 360-degree video, a time of day of start of panning, a movement direction, or the like), generates metadata, and sends the metadata to respective VR systems **100**, **110**, **120**, and **130** via VR cloud **300***a*. By generating additional information based on the metadata when reproducing a VR space using the 360-degree video, VR systems **100**, **110**, **120**, and **130** can prevent VR sickness and present appropriate guidance information.
(165) In this case, when assuming smartphone **210** having functions of a GPS, an IMU (inertial measurement unit), a camera, and the like as the guide's terminal, the following two scenarios are possible: (1) acquiring data effective for metadata generation using position information, acceleration information, and the like of smartphone **210**, sending the acquired data to VR cloud **300***a* and observation system **200***a*, and having VR cloud **300***a* and observation system **200***a* generate metadata; and (2) acquiring data effective for metadata generation using position information, acceleration information, and the like of smartphone **210**, sending the acquired data to VR cloud **300***a*, and having VR cloud **300***a* combine the data with metadata from observation system **200***a* to create metadata.
(166) In addition, by adding a movement start/stop button or the like to guide's remote controller **230** that is capable of communicating with smartphone **210** by BLE (registered trademark) and by having guide **20** press the button before moving or before stopping a movement, accuracy of movement detection or the like can be improved and more appropriate metadata can be generated.
Variation 2 of Example 1
(167) Next, Variation 2 of Example 1 will be described.
(168) FIG. **10** is a schematic configuration diagram of VR tourism system **2***b* according to Variation 2 of Example 1. VR tourism system **2***b* corresponds to a second specific example of solving the problem (1) (a simple user interface that enables diverse participants to use the VR tourism service must be provided) described above.
(169) In VR tourism system **2** according to Example 1 illustrated in FIG. **5**, guide's terminal **210** and the like have two functions, namely, a function of listening to voices of VR users **10** to **13** and a function of conveying audio of guide **20** to VR users **10** to **13** via VR cloud **300**. In VR tourism system **2***b* according to the present variation, audio of guide **20** is acquired from microphone **205** of observation system **200**. Therefore, in VR tourism system **2***b* according to the present variation, a portion of transferring audio of guide **20** to VR systems **100**, **110**, **120**, and **130** from guide's terminals **210** and the like and VR audio conference unit **310***a* of VR cloud **300***a* has been deleted from VR tourism system **2** according to Example 1.
(170) As described above, even in VR tourism system **2***b* according to the present variation, only a path of acquiring audio of guide **20** differs from Example 1 and the problem (1) described above is solved.
Example 2
(171) Next, Example 2 will be described as a specific example of solving the problem (2) (bad-mannered users who obstruct provision of an explanation by guide **20** by verbally abusive language, continuous questions, and the like must be eliminated) described above.
(172) (2) Even VR users who make inappropriate remarks and obstruct an explanation by guide **20** by verbally abusive language, continuous questions, and the like may possibly participate in VR tourism. Tourism experience by other good VR users is inhibited unless utterances by such participants are eliminated. When such a situation occurs, guide **20** must handle the situation with a simple operation. Specifically, a function of muting an utterance of the corresponding user with an instruction by guide **20** and enabling “utterances not allowed” to continue even in a state where “utterances are allowed” for other users in order to prevent the corresponding user from making subsequent utterances is required, and a VR tourism system having such a function will be described as a VR tourism system according to Example 2. The VR tourism system according to

Example 2 is a system in which a function of solving the problem (2) has been added to VR tourism system **2** according to Example 1.

(173) FIG. **11** is a diagram illustrating an operation example of a VR tourism system according to Example 2. More specifically, (a) in FIG. **11** illustrates a display example in VR systems **100**, **110**, **120**, and **130**, display examples **240***c* and **240***d* using an audio control application in smartphone **210** of guide **20**, an operation example of guide's remote controller **230**, and an operation example of VR remote controller **106** by VR user **10** or the like. In FIG. **11**, (b) illustrates same operation mode explanation table **410** as in (b) in FIG. **4**. In FIG. **11**, (c) illustrates user management table **330** included in a VR audio conference unit according to the present example. User management table **330** is an example of blocking information **70** in an embodiment including permission/refusal information that indicates, with respect to each of a plurality of participants, whether or not to block questions to an explainer and, specifically, user management table **330** is an information table that records a “mode” indicating, for each VR user (“User-ID”), whether or not (“Block” or “OK”) the VR user is a user who is an object of the block.

(174) As illustrated in (a) in FIG. **11**, VR systems **100**, **110**, **120**, and **130** having three display modes, UIs of guide's remote controller **230** and VR remote controller **106**, and internal operation processing are the same as in Example 1.

(175) In addition, in the VR cloud, while basic functions (switching between “questions allowed” **401***a* and “questions not allowed” **400***a*) of guide instructions are the same as in Example 1, the following functions have been added.

(176) Specifically, as illustrated in (c) in FIG. **11**, user management table **330** that records, for each VR user, whether the VR user is a good user or a user who makes an inappropriate remark has been added in the VR cloud. User management table **330** is an example of blocking information **70** according to Variation 1 of the embodiment.

(177) In addition, as illustrated in display examples **240***c* and **240***d* and an operation example of guide's remote controller **230** in (a) in FIG. **11**, a function has been added which enables a “block” instruction for guide **20** to block (forced mute) utterances of a user having made an inappropriate remark and an “unblock” instruction that allows utterances of a blocked user.

(178) Furthermore, a function has been added which, when a “block” instruction is issued, changes a value of “Mode” of a corresponding user in user management table **330** to “Block” and performs forced muting of the corresponding user.

(179) In addition, a function has been added which, when guide **20** issues an “unblock” instruction, changes values of “Mode” of all users in user management table **330** to “OK”. Note that when guide **20** issues an “utterance allowed” instruction, display in the VR system with respect to a user of which the value of “Mode” in user management table **330** is “Block” remains unchanged as “questions not allowed” **400***a*.

(180) FIG. **12** is a schematic configuration diagram of VR tourism system **3** according to Example 2. VR tourism system **3** is a system in which a function of solving the problem (2) has been added to VR tourism system **2** according to Example 1 and includes VR systems **100**, **110**, **120**, and **130**, VR cloud **300***b*, guide's terminal **210** and the like, and observation system **200**. VR audio conference unit **310** of VR cloud **300***b* includes user management table **330** in addition to components according to Example 1.

(181) A configuration of VR systems **100**, **110**, **120**, and **130** of VR users **10** to **13** is the same as the configuration example of VR tourism system **2** according to Example 1 illustrated in FIG. **5** and operation methods of VR users **10** to **13** are also the same. In other words, VR users **10** to **13** are prevented from becoming aware of the fact that a user who makes an inappropriate remark is being blocked.

(182) A configuration in VR audio conference unit **250** of guide's terminal **210** and the like is also the same as in Example 1. As a change, since “block” and “unblock” have been added to “questions allowed” and “questions not allowed” in VR tourism system **2** according to Example 1 as input

received by input unit **212**, “guide's instruction” that is sent to VR cloud **300***b* has also been added.
(183) VR audio conference unit **310** of VR cloud **300***b* is an example of controller **62***a* according to Variation 1 of the embodiment and receives the “guide's instruction” sent from guide's terminal **210** and the like in VR cloud **300***b*, and when instruction contents thereof are “questions allowed” or “questions not allowed”, VR audio conference unit **310** records the “guide's instruction” in guide instruction recorder **315**. When the instruction from guide **20** is “block” and “unblock”, VR audio conference unit **310** updates, in accordance with the instruction, user management table **330** for recording a user who makes an inappropriate remark.
(184) Furthermore, VR audio conference unit **310** generates a “control instruction” for controlling VR audio conference unit **105** of VR systems **100**, **110**, **120**, and **130**, transmits the “control instruction” to all VR systems **100**, **110**, **120**, and **130** and, as a result, in VR systems **100**, **110**, **120**, and **130**, guidance display controller **109** constantly displays “questions not allowed” **400***a* with respect to a blocked user.
(185) FIG. **13** is a diagram illustrating an operation flow example of VR tourism system **3** (in other words, a specific example of a video display method) according to Example 2. More specifically, (a) in FIG. **13** illustrates an operation flow of VR systems **100**, **110**, **120**, and **130**, (b) in FIG. **13** illustrates same operation mode explanation table **410** as (c) in FIG. **11** for reference, (c) in FIG. **13** illustrates an operation flow of VR cloud **300**, and (d) in FIG. **13** illustrates same user management table **330** as (c) in FIG. **11** for reference.
(186) As illustrated in (c) in FIG. **13**, in VR cloud **300***b*, conversation controller **311** is capable of accepting a “guide's instruction” (a transition to “questions allowed” and a transition to “questions not allowed”) from an APP of smartphone **210** or from guide's remote controller **230** or the like via input unit **212** and guide instruction generator **211** of guide's terminal **210** or the like (S**50**).
(187) In addition, conversation controller **311** determines the accepted “guide's instruction” and sorts instructions into the following four types of processing (S**51** to S**54**). Specifically, when “guide's instruction” is “questions allowed” (Y in S**51**), the instruction is set to “questions allowed” (S**60**), when “guide's instruction” is “questions not allowed” (Y in S**52**), the instruction is set to “questions not allowed” (S**61**), when “guide's instruction” is “block” (Y in S**53**), a value of the user presently engaged in conversation in user management table **330** is changed to “Block” (S**62**), and when “guide's instruction” is “unblock” (Y in S**54**), values of all users in user management table **330** are changed to “OK” (S**63**).
(188) Furthermore, conversation controller **311** notifies all VR systems **100**, **110**, **120**, and **130** that guide **20** has issued a new instruction (instruction change notification) together with instruction contents (however, a user of which the value in user management table **330** is “block” is notified “questions not allowed” as instruction contents) (steps S**70** to S**75**) and returns to step S**50**.
(189) More specifically, in processing of transmitting the instruction change notification to each VR system (S**70** to S**75**), conversation controller **311** first sets variable N to **1** (S**70**) and next extracts an N-th value from user management table **330** and increments variable N (S**71**). In addition, conversation controller **311** determines whether or not the value extracted from user management table **330** is “block” (S**72**) and, in the case of “block” (Y in S**72**), sets the instruction to “questions not allowed” (S**73**) and transmits an instruction change notification to a corresponding VR system (S**74**). When the value extracted from user management table **330** is not “block” (N in S**72**), conversation controller **311** transmits an instruction change notification to the corresponding VR system (S**74**) without setting the instruction to “questions not allowed”.
(190) Conversation controller **311** determines whether or not confirmation has been finished with respect to all VR users (S**75**) and, if not finished (N in S**75**), repeats steps S**71** to S**75** until confirmation is finished with respect to all VR users.
(191) On the other hand, as illustrated in (a) in FIG. **13**, operations of respective VR systems **100**, **110**, **120**, and **130** are the same as operations of respective VR systems **100**, **110**, **120**, and **130** according to Example 1. Specifically, while main processing of a VR tourism distribution service is

performed in each VR system **100**, **110**, **120**, or **130**, when there is interrupt processing by a guide instruction from VR cloud **300** as illustrated in (a) in FIG. **13**, interrupt processing similar to that in Example 1 is performed (S**20** to S**25**). In addition, although not illustrated in FIG. **13**, when there is an interrupt by a VR user input from VR remote controller **106** and the like, VR systems **100**, **110**, **120**, and **130** perform interrupt processing similar to that in Example 1 (S**30** to S**40** in FIG. **6**).

(192) As described above, due to VR tourism system **3** according to Example 2, an utterance by a user who makes an inappropriate remark is eliminated using a simple user interface and the problem (2) described earlier is solved as in the operation example illustrated in FIG. **11**.

Example 3

(193) Next, Example 3 will be described as a specific example that solves the problem (3) (private conversations by participants with traveling companions must be supported) described above.

(194) Before describing a specific example that solves the problem (3), first, the problem (3) will be described in detail using drawings.

(195) FIG. **14** is a diagram in which a description of the problem (3) has been added to VR tourism system **650** according to the reference example illustrated in FIG. **1**A. As illustrated in FIG. **14**, in VR tourism system **650** according to the reference example, since each of VR users **10** to **13** is participating in the VR tourism service using different VR systems **600**, **610**, **620**, and **630**, VR users **10** to **13** can only engage in conversation in a shared VR space during their participation. In other words, since utterances by VR users **10** to **13** in the VR space are shared among all participants, VR users **10** to **13** cannot engage in private conversations.

(196) In the case of a videoconferencing system for business instead of a VR tourism system, since private conversations are usually not allowed during a conference, such an application is rare. Therefore, systems such as Teams (registered while videoconferencing trademark) and Zoom (registered trademark) provide a “Breakout Room” function of going into another conference room and having a conversation, there is no function for a specific group to engage in a private conversation in a same conference room. In addition, in an interaction/conference system in a VR space constituted by 3DCG such as VRChat, while there is a function for increasing a volume of a voice of a nearby person and reducing a volume of a voice of a faraway person, a private conversation function in a group is not implemented.

(197) During a normal real group tour, a situation where a group member can no longer engage in private conversations with other group members does not occur. Therefore, in a VR tourism service, support is required for conversations in a same group. In such a case, the conversation must be prevented from being heard by guide **20** or tourists outside of the group.

(198) In consideration thereof, a function capable of supporting a private conversation between friends who travel together is required and a VR tourism system having such a function will be described as a VR tourism system according to Example 3. The VR tourism system according to Example 3 is a system in which a function of solving the problem (3) has been added to VR tourism system **3** according to Example 2.

(199) FIG. **15** is a diagram illustrating an operation example of the VR tourism system according to Example 3. More specifically, (a) in FIG. **15** illustrates a display example in VR systems **100**, **110**, **120**, and **130**, smartphone **210** and guide's remote controller **230** of guide **20**, and VR remote controller **106** of VR user **10** or the like.

(200) In FIG. **15**, (b) illustrates operation mode explanation table **411** according to the present example. In operation mode explanation table **411**, an item of “mute function for group audio conference” has been added to operation mode explanation table **411** according to Example 1. As indicated in the item of “mute function for group audio conference”, when a “mute function of VR system” is “muted”, the “mute function for group audio conference” becomes “group conversation allowed (unmuted)” and when the “mute function of VR system” is “unmuted”, the “mute function for group audio conference” becomes “muted”.

(201) In FIG. **15**, (c) illustrates user management table **331** included in a VR audio conference unit

according to the present example. User management table **331** is an information table created by adding a group ID ("G-ID") for each VR user to user management table **330** according to Example 2. User management table **331** is an example of blocking information **71** according to Variation 2 of the embodiment.

(202) When participating in a videoconference, although a conversation cannot be held with a part of the participants while preventing the conversation from being heard by other participants or a speaker, separately using a chat application such as Line (registered trademark) or WeChat (registered trademark) after muting oneself while participating in the videoconference to prevent his/her own conversation from becoming audible to the videoconference enables a group call with a part of the participants to be performed. However, participating in a videoconference using a PC and launching a chat application with smartphone **210** is a hassle and supporting both functions with a single VR tourism system is desired.

(203) In the present example, based on the VR tourism system described in the operation example illustrated in FIG. **4**, a private conversation in a group is realized by combining a function for setting a separate audio conference in a VR cloud for each group of which a VR user submits an application when signing up (upon participation, during participation) for VR tourism. Simply combining the two systems may make operations complicated and an inappropriate use of a muter or the like may cause a group conversation to leak out to a VR space and may annoy guide **20** or other VR users.

(204) In consideration thereof, in the present example, as in the operation example illustrated in FIG. **15**, voices of VR users **10** to **13** are not transmitted to the inside of the VR space unless VR users **10** to **13** explicitly present a question to guide **20**. In other words, in states of "questions not allowed" and "questions allowed", a conversation within a group is not shared with the VR space (the "mute function for group audio conference" in (b) in FIG. **15** is "group conversation allowed (unmuted)"). In other words, operations by VR users are absolutely unnecessary in order to engage in a conversation within a group. On the other hand, only when guide **20** sets "question in progress" by an operation using guide's remote controller **230** in order for VR user **10** or the like in a group to ask guide **20** a question, a group audio conference of a corresponding user is muted in the VR tourism system (the "mute function for group audio conference" in (b) in FIG. **15** is "muted").

(205) Since using the VR tourism system according to the present example completely prevents a conversation within a group from being heard by other participants, group tourism in which privacy is more protected than in the real world can be realized.

(206) FIG. **16** is a block diagram illustrating a detailed configuration of VR tourism system **4** according to Example 3. VR tourism system **4** is a system in which a function of solving the problem (3) has been added to VR tourism system **3** according to Example 2 and includes VR systems **100**, **110**, **120**, and **130**, VR cloud **300***c*, guide's terminal **210** and the like, and observation system **200**.

(207) In VR cloud **300***c*, group audio conference units **341***a* to **341***c* that assist an audio conference for each group and VR tourism service manager **340** that manages VR tourism and group audio conferences are added to VR cloud **300***b* according to Example 2 and user management table **331** to which group IDs have been added is provided in place of user management table **330** according to Example 2. Group audio conference units **341***a* to **341***c* are examples of group audio conversation unit **64** according to Variation 2 of the embodiment and VR tourism service manager **340** is an example of controller **62***b* according to Variation 2 of the embodiment.

(208) In addition, in VR audio conference unit **105***a* of VR systems **100**, **110**, **120**, and **130**, AV demultiplexer **183** that demultiplexes a 360-degree video and audio data from a 360-degree video sent from VR cloud **300***c*; audio decoder **184** that decodes the demultiplexed audio data; audio decoder **182***a* that decodes audio data sent from group audio conference units **341***a* to **341***c* of VR cloud **300***c*; audio mixer **182***b* that mixes the two pieces of audio data decoded by audio decoder

182*a* and audio decoder **184**; and D/A converter **182***c* that converts the mixed audio data into an analog audio signal and outputs the analog audio signal to loudspeaker **182***d* have been added to the configuration of VR audio conference unit **105** according to Example 1 and Example 2, and first muter **181** that performs mute processing for VR tourism and second muter **180** that performs mute processing among group audio conference units **341***a* to **341***c* are provided in place of muter **108***c* according to Example 1 and Example 3. Note that 360-degree video processor **186** corresponds to VR space generator **103** according to Example 1.

(209) In other words, VR tourism system **4** according to the present example is obtained by adding, inside VR cloud **300** of the configuration example of VR tourism system **2** according to Example 1 illustrated in FIG. **5**, group audio conference units **341***a* to **341***c* for realizing a conversation for each user group, VR tourism service manager **340** that manages an entire system, and user management table **331** for managing which group each user belongs to.

(210) VR audio conference unit **310** that realizes a conversation between VR users **10** to **13** and guide **20** and group audio conference units **341***a* to **341***c* that realizes a group conversation in VR cloud **300***c* are completely independent of each other and pieces of audio data managed by the two functions in VR cloud **300***c* never become mixed. Group audio conference units **341***a* to **341***c* are initialized in VR cloud **300***c* in a same number as the number of groups participating in same VR tourism when users participate in the VR tourism using VR systems **100**, **110**, **120**, and **130**.

(211) Group audio conference units **341***a* to **341***c* have a simple configuration of only collecting pieces of audio data used by VR users **10** and the like belonging to a same group, mixing the pieces of audio data, and returning the audio data to respective VR systems **100**, **110**, **120**, and **130**. In addition, VR audio conference unit **310**, 360-degree video distributor **320**, and guide's terminal **210** and the like of VR cloud **300***c* have exactly the same configurations and functions as the configuration example of VR tourism system **2** according to Example 1 illustrated in FIG. **5**.

(212) In addition to the constituent elements of Example 1 illustrated in FIG. **5**, a function of sending audio data inputted from microphone **108** of VR systems **100**, **110**, **120**, and **130** to group audio conference units **341***a* to **341***c* and second muter **180** that performs mute control with respect to the audio data to be sent are added to VR systems **100**, **110**, **120**, and **130**. Furthermore, a function of receiving 360-degree video data sent from VR cloud **300***c*, performing AV demultiplexing, and mixing segmented audio data with audio conversation data within groups sent from group audio conference units **341***a* to **341***c* (AV demultiplexer **183**, audio decoder **184**, audio decoder **182***a*, audio mixer **182***b*, and D/A converter **182***c*) have been added.

(213) While the functions described above are added to VR systems **100**, **110**, **120**, and **130**, since there are no operations by VR users **10** to **13** with respect to group audio conference units **341***a* to **341***c*, operations by VR users **10** to **13** are similar to Example 1 illustrated in FIG. **5**. However, when guide **20** operates guide's remote controller **230** in order for a VR user to set “question in progress”, the mute function of first muter **181** is unmuted, the mute function of second muter **180** is set, and audio data of a corresponding user does not flow to group audio conference units **341***a* to **341***c*. In other words, since audio data of the corresponding user is included in the 360-degree video data, the other VR users in the group can listen to the conversation with guide **20**.

(214) FIG. **17** is a diagram illustrating an operation flow example of VR tourism system **4** (in other words, a specific example of a video display method) according to Example 3. More specifically, (a) in FIG. **17** illustrates an operation flow of VR systems **100**, **110**, **120**, and **130** and (b) in FIG. **17** illustrates an operation flow of VR cloud **300***c*.

(215) Main processing of VR systems **100**, **110**, **120**, and **130** is the same as in Example 1 and Example 2 (not illustrated).

(216) Interrupt processing of input from a VR user in VR systems **100**, **110**, **120**, and **130** becomes a flow in which, in steps S**30** to S**40** according to Example 1 illustrated in FIG. **6**, steps S**38***a* and S**40***a* are respectively performed in place of steps S**38** and S**40** and steps S**110** and S**111** are newly added. In other words, guidance display controller **109** changes the display mode to “question in

progress" (S**37**), and when first muter **181** sets unmute (S**38***a*), second muter **180** sets mute (S**110**). In addition, guidance display controller **109** changes the display mode to "questions allowed" (S**39**), and when first muter **181** sets to "mute" (S**40***a*), second muter **180** unmutes (S**111**).
(217) Furthermore, interrupt processing from VR cloud **300***c* in VR systems **100**, **110**, **120**, and **130** is the same as in Example 1 and Example 2 (not illustrated).
(218) As illustrated in (a) in FIG. **17**, in initialization in VR systems **100**, **110**, **120**, and **130**, first, since a VR tourism service application to which VR systems **100**, **110**, **120**, and **130** are mounted is launched (S**100**), a VR user inputs a user ID and a password (S**101**), transmits the user ID and the password to VR cloud **300** (S**102**), and awaits a reply from VR cloud **300** (S**103**).
(219) As a result, when the received reply is an error (Y in S**104**), a return is made to step S**101**, but when the received reply is normal (N in S**104**), a transition is made to main processing of VR systems **100**, **110**, **120**, and **130** (S**105**).
(220) On the other hand, in VR cloud **300***c*, main processing is the same as in Example 1 and Example 2 (not illustrated).
(221) In addition, in login processing of VR cloud **300***c*, as illustrated in (b) in FIG. **17**, VR tourism service manager **340** first acquires a user ID and a password from VR systems **100**, **110**, **120**, and **130** (S**90**) and checks whether a user is a legitimate user of the present tourism service (S**91**).
(222) As a result, when the user is not a legitimate user (N in S**91**), VR tourism service manager **340** transmits an error to corresponding VR system **100** or the like (S**92**) and returns to step S**90**. When the corresponding user is a legitimate user (Y in S**91**), VR tourism service manager **340** acquires a value of the user from user management table **331** (S**93**).
(223) When the acquired corresponding user is a solo traveler (N in S**95**), a jump is made to step S**99**. In a case of a group traveler having made a first login (N in S**96**), VR tourism service manager **340** starts (initializes) a group audio conference in which the corresponding user participates (S**97**).
(224) In a case of a group traveler not having made a first login (Y in S**96**) and when step S**97** has been completed, VR tourism service manager **340** connects VR systems **100**, **110**, **120**, and **130** of the corresponding user to the group audio conference of the corresponding user (S**98**), transmits the fact that preparation for use of the tourism service has been normally completed to corresponding VR systems **100**, **110**, **120**, and **130** (S**99**), and ends processing.
(225) As described above, VR tourism system **4** according to the present example supports a private conversation between friends who travel together among participants and solves the problem (3) described above.

Variation 1 of Example 3

(226) Next, Variation 1 of Example 3 will be described.
(227) FIG. **18** is a block diagram illustrating a detailed configuration of VR tourism system **4***a* according to Variation 1 of Example 3. VR tourism system **4***a* corresponds to a second specific example that solves the problem (3) (private conversations by participants with traveling companions must be supported) described above.
(228) VR tourism system **4***a* according to the present variation has a configuration (in other words, VR audio conference unit **105***b*) in which volume adjuster **187** is added to VR audio conference unit **105** of VR systems **100**, **110**, **120**, and **130** in VR tourism system **4** according to Example 3 illustrated in FIG. **16**.
(229) Volume adjuster **187** is an example of a function of controller **62***b* according to Variation 2 of the embodiment among functions of a controller according to the embodiment for controlling, when assisting a group audio conversation, a plurality of VR systems that correspond to a plurality of participants who belong to a same group so as to adjust a volume of at least one of audio from an explainer to a plurality of participants belonging to the same group and audio of the group audio conversation.
(230) Specifically, in order to accommodate a case where audio of guide **20** and audio of a conversation in a group are mixed and are indiscernible, VR tourism system **4***a* according to the

present variation has a configuration in which volume adjuster **187** that adjusts a volume with respect to audio from group audio conference units **341***a* to **341***c* has been added to VR tourism system **4** according to Example 3 illustrated in FIG. **16**.

(231) VR users **10** to **13** have VR remote controller with volume adjustment function **106***a*, and volume of audio from group audio conference units **341***a* to **341***c* can be adjusted by performing an operation of changing a volume of VR remote controller with volume adjustment function **106***a* or the like.

(232) Note that a configuration of VR systems **100**, **110**, **120**, and **130** and an operation flow of processing in VR systems **100**, **110**, **120**, and **130** and VR cloud **300***c* are the same as in Example 1.

(233) As described above, even with VR tourism system **4***a* according to the present variation, volume adjuster **187** supports a private conversation between friends who travel together among participants and the problem (3) described above is solved.

Example 4

(234) Next, Example 4 will be described as a specific example that solves the problem (4) (a plurality of languages and a plurality of guides must be accommodated with respect to participants in VR tourism in order to accommodate foreign travel and foreigners) described above.

(235) Before describing a specific example that solves the problem (4), first, the problem (4) will be described in detail using drawings.

(236) FIG. **19** is a diagram in which a description of the problem (4) has been added to VR tourism system **650** according to the reference example illustrated in FIG. **1**A. In the VR tourism system, providing a VR tourism experience with high resolution and a strong realistic sensation requires photography with a resolution of at least 8K video and preferably 11K video. However, photography of 8K video and 11K video involves large equipment, a high video transmission rate, and a large capacity. Therefore, both photography and distribution end up being costly. Therefore, a VR tourism service does not make sense as a business unless the VR tourism service is used by many VR users.

(237) In order to increase the number of participants in one VR sightseeing tour, even when VR users **10** to **13** who use different languages participate, the number of object persons can be increased if explanations provided by guide **20** can be received in their own languages. However, as illustrated in FIG. **19**, since the inside of a shared VR space is used when participating in VR tourism in VR tourism system **650** according to the reference example, conversations with guide **20** or other users can only be held in one language. In other words, since a language of use of VR users in the VR space is to be shared and used among all participants, the language becomes a language of use of guide **20** and a plurality of languages cannot be supported at the same time.

(238) While a multilingual service is desirably provided in order to increase the number of users by preparing a plurality of guides **20** for each language or even using simultaneous interpreters from the perspective of a provider of a VR tourism service, since VR tourism service **650** according to the reference example illustrated in FIG. **19** is incapable of supporting guides **20** of a plurality of languages, a separate tour must be organized for each language.

(239) In consideration thereof, in order to accommodate foreign travel and foreigners, a plurality of languages and a plurality of guides must be accommodated with respect to participants in VR tourism and a VR tourism system having such a function will be described as a VR tourism system according to Example 4. The VR tourism system according to Example 4 is a system in which a function of solving the problem (4) has been added to VR tourism system **2** according to Example 1.

(240) FIG. **20** is a diagram illustrating a use case that is desirably realized by the VR tourism system according to Example 4 or, in other words, a diagram illustrating required specifications of a VR tourism service. More specifically, (a) in FIG. **20** illustrates an example of a case in which Japanese users are provided with VR tourism at a foreign tourist destination. Due to a Japanese VR tourism service provider dispatching its own guide **20** or photography crew to Egypt **420***a* and

providing a VR tourism service, if the Japanese VR tourism service provider can set up an appliance with a business operator who performs an on-site English VR tourism service for English-speaking countries **420***c* and subsequently change a language of use of guide **20** to Japanese, types of VR tourism services for Japanese (Japan **420***b*) can be increased in an inexpensive and efficient manner.

(241) In FIG. **20**, (b) illustrates an example of providing foreign users with VR tourism of tourist destinations in Japan **421***a*. In a case of English, Chinese, and Spanish which have a large number of speakers, each language independently enables VR tourism users in various countries to be reached. However, in a case of Vietnamese (Vietnam **421***b*) or Thai (Thailand **421***c*), even when independently hosting VR tourism is difficult although a certain number of users can be expected, VR tourism can be hosted if a plurality of languages can be supported.

(242) FIG. **21** is a schematic configuration diagram of VR tourism system **5** according to Example 4. VR tourism system **5** is a system in which a function of solving the problem (4) has been added to VR tourism system **2** according to Example 1 and includes VR systems **100**, **110**, **120**, and **130**, VR cloud **300***d*, first guide's terminal **210***a* and the like, second guide's terminal **210***b* and the like, and observation system **200**.

(243) First guide's terminal **210***a* and the like are examples of first explainer terminal **40***a* in Variation 3 of the embodiment which performs input and output of audio with Japanese guide **20***a* being a first explainer who provides explanations in a first language and first guide's terminal **210***a* and the like are constituted of smartphone **210***a* which accommodates the first language, headset **220***a*, and guide's remote controller **230***a*.

(244) Second guide's terminal **210***b* and the like are examples of second explainer terminal **40***b* in Variation 3 of the embodiment which performs input and output of audio with English guide **20***b* being a second explainer who provides explanations in a second language and second guide's terminal **210***b* and the like are constituted of smartphone **210***b* which accommodates the second language, headset **220***b*, and guide's remote controller **230***b*.

(245) VR cloud **300***d* includes first VR audio conference unit **310***b*, second VR audio conference unit **310***c*, user management table **330***a*, guide language management table **332**, and 360-degree video distributor **320***c*.

(246) First VR audio conference unit **310***b* is an example of the first audio conversation unit according to Variation 3 of the embodiment which assists an audio conversation between participants and the first explainer via the plurality of VR systems and the first explainer terminal. Second VR audio conference unit **310***c* is an example of the second audio conversation unit according to Variation 3 of the embodiment which assists an audio conversation between participants and the second explainer via the plurality of VR systems and the second explainer terminal.

(247) As illustrated in FIG. **21**, user management table **330***a* is an information table that records, for each VR user ("User-ID"), a language ("Language") used by the VR user and a guide ID ("Guide-ID") of a corresponding guide. Guide language management table **332** is an information table that records, for each guide ID ("Guide-ID"), a language ("Language") used by the guide.

(248) More specifically, a configuration example of VR tourism system according to Example 4 illustrated in FIG. **21** is approximately the same as the configuration example of VR tourism system **2** according to Example 1 illustrated in FIG. **3**. Main differences are that A) a VR audio conference unit (first VR audio conference unit **310***b* and second VR audio conference unit **310***c*) is provided for each of Japanese guide **20***a* and English guide **20***b* in VR cloud **300***d* and all audio data is sent using the VR audio conference unit (first VR audio conference unit **310***b* and second VR audio conference unit **310***c*) instead of sending the audio data to 360-degree video distributor **320**, and B) VR cloud **300***d* has user management table **330***a* and has means for connecting each VR user to suitable first VR audio conference unit **310***b* or second VR audio conference unit **310***c* so that when the VR user starts using the VR tourism service, the VR user can receive service by

Japanese guide **20***a* or English guide **20***b* matching the VR user's own language.
(249) In the present example, while a 360-degree video that captures Japanese guide **20***a* and English guide **20***b* is shared, audio control is independent and each of Japanese guide **20***a* and English guide **20***b* performs operation of VR system **100** or the like of his/her own VR user **10** and the like. From VR users **10** to **13**, each VR space appears to be independent and, for example, a Japanese user remains completely unaware of the presence of English guide **20***b* or English users.
(250) FIG. **22** is a diagram illustrating an example of a use case that is realized by VR tourism system **5** according to Example 4. More specifically, (a) in FIG. **22** illustrates a case where VR tourism by an English guide of a foreign (Egypt **422***a*) tourist destination is provided to not only VR users in English-speaking countries **422***c* but also to VR users in Japan **422***b*, and (b) in FIG. **22** illustrates a case where VR tourism by a Vietnamese guide and a Thai guide at a tourist destination in Japan **423***a* is provided to foreign (Vietnam **423***b* and Thailand **423***c*) VR users.
(251) As illustrated in (a) and (b) in FIG. **22**, in each case, if the two guides (Japanese guide **20***a* and English guide **20***b*, Vietnamese guide **20***a***1** and Thai guide **20***b***1**) can provide explanations in their own languages, the use cases to be realized described in (a) and (b) in FIG. **20** become realizable.
(252) FIG. **23** is a diagram illustrating an example of a field of view provided by VR systems **100**, **110**, **120**, and **130** in VR tourism system **5** according to Example 4. Here, an example of a field of view of a user of each guide (field of view **424***b* of a Vietnamese user ((b) in FIG. **23**), field of view **424***c* of a Thai user ((c) in FIG. **23**)) in a case (VR tourism in Japan **424***a*) where there are two guides (Vietnamese guide **20***a***1** and Thai guide **20***b***1**) in a 360-degree video is illustrated.
(253) In the case of a 360-degree video, since there is no frame that serves as a boundary of the video, a photographer can perform photography without worrying about positions of the guides (Vietnamese guide **20***a***1** and Thai guide **20***b***1**). In addition, VR users **10** to **13** can view any range within 360 degrees. Therefore, as illustrated in (a) in FIG. **23**, when a frame is set as in ordinary camera photography, both guides are positioned off-center and a sense of discomfort is created, but since VR users of each language are only conscious of the guide of his/her own language (Vietnamese guide **20***a***1** or Thai guide **20***b***1**), as illustrated in (b) and (c) in FIG. **23**, Vietnamese guide **20***a***1** and Thai guide **20***b***1** can be respectively placed at a center of a field of view and a sense of discomfort is not created. Therefore, by having the two guides provide explanations in their own languages and by sharing video, VR users **10** to **13** can engage in conversation with guide **20** or obtain an explanation from guide **20** who matches his/her own language and a value of VR tourism experience is enhanced.
(254) FIG. **24** is a block diagram illustrating a detailed configuration of VR tourism system **5** according to Example 4. VR audio conference unit **105***a* of VR systems **100**, **110**, **120**, and **130** is the same as that in Example 3. First VR audio conference unit **310***b* and second VR audio conference unit **310***c* both have the same configuration as VR audio conference unit **310** according to Example 1. VR audio conference units **250** included in first guide's terminal **201***a* and the like used by Japanese guide **20***a* and second guide's terminal **210***b* and the like used by English guide **20***b* both have the same configuration as VR audio conference unit **250** according to Example 1.
(255) In other words, while VR tourism system **5** according to fourth example has approximately the same configuration as the configuration of VR tourism system **2** illustrated in FIG. **5** or VR tourism system **3** illustrated in FIG. **12**, a difference in VR cloud **300***d* is that two independent VR tourism services are realized by two VR audio conference units (first VR audio conference unit **310***b* and second VR audio conference unit **310***c*) which share 360-degree video distributor **320**.
(256) Both guide's terminals (first guide's terminal **210***a* and the like and second guide's terminal **210***b* and the like) are similar to guide's terminal **210** and the like according to Example 1 illustrated in FIG. **5** in terms of a configuration, functions, and operations by a guide.
(257) Both VR audio conference units (first VR audio conference unit **310***b* and second VR audio conference unit **310***c*) of VR cloud **300***d* are similar to VR audio conference unit **310** according to

Example 1 illustrated in FIG. **5** in terms of a configuration and functions.
(258) Besides the addition of means for compositing audio from VR audio conference unit (first VR audio conference unit **310***b* and second VR audio conference unit **310***c*) of VR cloud **300***d* with audio of a 360-degree video, VR audio conference unit **105***a* of VR systems **100**, **110**, **120**, and **130** is similar to VR audio conference unit **105** according to Example 1 illustrated in FIG. **5** in terms of functions and operations by VR users **10** to **13**.
(259) A difference from Example 1 is that VR tourism service manager **340** and user management table **331** are newly provided in VR cloud **300***d*, and when VR users **10** to **13** start use of the VR tourism service, VR tourism service manager **340** connects each VR user to an appropriate VR audio conference unit (first VR audio conference unit **310***b* and second VR audio conference unit **310***c*) so that the VR user can receive service of a guide matching his/her own language. VR tourism service manager **340** is an example of controller **62***c* according to Variation 3 of the embodiment and user management table **331** is an example of language information **72** according to Variation 3 of the embodiment.
(260) FIG. **25** is a diagram illustrating an operation flow example of VR tourism system **5** (in other words, a specific example of a video display method) according to Example 4. More specifically, (a) in FIG. **25** illustrates an operation flow of VR systems **100**, **110**, **120**, and **130** and (b) in FIG. **25** illustrates an operation flow of VR cloud **300***d*.
(261) In each of VR systems **100**, **110**, **120**, and **130**, main processing, interrupt processing of input from VR users, and interrupt processing from VR cloud **300***d* are the same as in Example 1 and Example 2 (not illustrated).
(262) In addition, in VR systems **100**, **110**, **120**, and **130**, initialization processing ((a) in FIG. **25**) by which a VR user starts using VR tourism is the same as the operation flow (S**100** to S**105**) according to Example 3 illustrated in (b) in FIG. **17** and a description thereof will be omitted.
(263) Furthermore, in VR cloud **300***d*, main processing is the same as in Example 1 and Example 2 (not illustrated).
(264) As login processing in VR cloud **300***d*, as illustrated in (b) in FIG. **25**, VR tourism service manager **340** first acquires a user ID and a password from VR systems **100** and the like (S**140**) and checks whether a user is a legitimate user of the present tourism service (S**141**).
(265) When the user is not a legitimate user (N in S**141**), an error is transmitted to corresponding VR system **100** or the like (S**142**) and a return is made to step S**140**. When the user is a legitimate user (Y in S**141**), VR tourism service manager **340** acquires a value of the corresponding user from user management table **330** (S**143**).
(266) When language selection by the corresponding user is the same as the language of the first guide (for example, the language (Japanese) of Japanese guide **20***a*) (Y in S**145**), VR tourism service manager **340** connects VR system **100** or the like of the corresponding user to first VR audio conference unit **310***b* (S**145***a*) and jumps to step S**149**.
(267) On the other hand, when language selection by the corresponding user is the same as the language of the second guide (for example, the language (English) of English guide **20***b*) (Y in S**146**), VR tourism service manager **340** connects VR system **110** or the like of the corresponding user to second VR audio conference unit **310***c* (S**147**), transmits the fact that preparation for use of the tourism service has been normally completed to corresponding VR system **110** or the like (S**149**), and ends processing.
(268) When language selection by the corresponding user is neither the language of the first guide (N in S**145**) nor the language of the second guide (N in S**146**), VR tourism service manager **340** executes default language selection processing (S**148**) and returns to step S**145**.
(269) In default language selection processing (S**148**), for example, VR tourism service manager **340**: A) causes the corresponding user to select the language of the first guide (for example, the language (Japanese) of Japanese guide **20***a*) or the language of the second guide (for example, the language (English) of English guide **20***b*); B) selects English when the language of the first guide

or the second guide is English; or C) selects the language of the first guide (for example, the language (Japanese) of Japanese guide **20***a*).
(270) As described above, VR tourism system **5** according to the present example realizes accommodation by a plurality of languages and accommodation by a plurality of guides with respect to participants and solves the problem (4) described above.
Variation 1 of Example 4
(271) Next, Variation 1 of Example 4 will be described.
(272) FIG. **26** is a schematic configuration diagram of VR tourism system **5***a* according to Variation 1 of Example 4. VR tourism system **5***a* corresponds to a second specific example that solves the problem (4) (a plurality of languages and a plurality of guides must be accommodated with respect to participants in VR tourism in order to accommodate foreign travel and foreigners) described above.
(273) VR tourism system **5***a* is a system accommodating VR tourism including a Japanese-English simultaneous interpreter who accompanies a guide and has a configuration created by including third guide's terminal **210***c* for Japanese-English simultaneous interpreter **20***c* in place of second guide's terminal **210***b* and newly adding audio switcher **350** to VR cloud **300***e* in the configuration of VR tourism system **5** according to Example 4 illustrated in FIG. **21**. Third guide's terminal **210***c* is constituted of smartphone **210***c* for Japanese-English simultaneous interpreter **20***c* and headset **220***c*. Audio switcher **350** is an example of audio switcher **65** according to the embodiment that switches between outputting audio from the second explainer to a participant associated with the second language and outputting audio to the first explainer and a participant associated with the first language.
(274) In VR tourism system **5** according to Example 4 illustrated in FIG. **21**, a Japanese VR space and an English VR space exist completely independently of one another and each guide **20** supports VR users **10** to **13** whom guide **20** is in charge of. The present variation is configured such that, although the two language spaces are independent of each other, Japanese guide **20***a* issues instructions to all VR users **10** to **13** while Japanese-English simultaneous interpreter **20***c* only provides a simultaneous interpreting service and is unable to issue instructions to VR users **10** to **13**.
(275) Being aware that VR users include a Japanese user group and an English user group, Japanese guide **20***a* requires a distinction between the two user groups in the display modes of “questions not allowed” and “questions allowed” of VR tourism system **650** according to the reference example and also requires the three instructions of “questions not allowed”, “questions by Japanese user group allowed”, and “questions by English user group allowed”.
(276) Both Japanese users and English users are only conscious of Japanese guide **20***a* and the presence of Japanese-English simultaneous interpreter **20***c* is not explicitly visible. However, audio control is independent for each language group and although the Japanese users and the English users are aware of each others' presence, the Japanese users and the English users need not be conscious of the fact that different languages are being spoken.
(277) FIG. **27** is a diagram illustrating an example of a use case that is realized by VR tourism system **5***a* according to Variation 1 of Example 4. More specifically, (a) in FIG. **27** illustrates a case where VR tourism by an English guide at a foreign (Egypt **425***a*) tourist destination is provided to not only VR users in English-speaking countries **425***c* but also to VR users in Japan **425***b* via a Japanese-English simultaneous interpreter, (b) in FIG. **27** illustrates a case where VR tourism by a Thai guide at a tourist destination in Japan **426***a* is provided to foreign VR users (not only VR users in Thailand **426***c* but also VR users in Vietnam **426***b* via a Thai-Vietnamese simultaneous interpreter), and (c) in FIG. **27** illustrates a case where VR tourism by an English guide at a foreign (Egypt **427***a*) tourist destination is provided to not only VR users in English-speaking countries **427***c* but also to VR users in Japan **427***b* via a Japanese-English simultaneous interpreter and to VR users in Vietnam **427***d* via an English-Vietnamese simultaneous interpreter.

(278) If a guide and a simultaneous interpreter can cooperate with each other to provide explanations in their respective languages as in the example of the use case illustrated in FIG. **27**, the use case to be realized described with reference to FIG. **20** becomes realizable.
(279) FIG. **28** is a diagram describing functions of audio switcher **350** included in VR tourism system **5***a* according to Variation 1 of Example 4. More specifically, (a) in FIG. **28** illustrates state transition diagram **415** indicating a transition of a state of each VR user managed by VR tourism service manager **340**, (b) in FIG. **28** illustrates operation mode explanation table **411** describing each state illustrated in (a) in FIG. **28**, (c) in FIG. **28** illustrates a configuration example of audio switcher **350**, (d) in FIG. **28** illustrates operating states of audio switcher **350** in state "questions not allowed by anyone" **415***a*, state "guide-user questions allowed" **415***b*, and state "interpreter-user questions allowed" **415***d*, (e) in FIG. **28** illustrates an operating state of audio switcher **350** in state "guide-user question in progress" **415***c*, and (f) in FIG. **28** illustrates an operating state of audio switcher **350** in state "interpreter-user question in progress" **415***e*.
(280) In state transition diagram **415** illustrated in (a) in FIG. **28**, a solid arrow indicates a transition when Japanese guide **20***a* issues an instruction of "questions not allowed", a dashed arrow indicates a transition when Japanese guide **20***a* issues an instruction of "questions allowed" to Japanese guide **20***a*, and dotted arrow indicates a transition when Japanese guide **20***a* issues an instruction of "questions allowed" to Japanese-English simultaneous interpreter **20***c*.
(281) In operation mode explanation table **411** illustrated in (b) in FIG. **28**, "state" indicates states **415***a* to **415***e* illustrated in (a) in FIG. **28**, "guide's instruction" indicates an instruction by Japanese guide **20***a*, "VR display state (Guide)" indicates a display mode in a VR system of a VR user having selected Japanese guide **20***a*, "VR display state (SI)" indicates a display mode in a VR system of a VR user having selected Japanese-English simultaneous interpreter **20***c*, "VR mute function (G)" indicates a mute state of a VR user having selected Japanese guide **20***a*, "VR mute function (SI)" indicates a mute state of a VR user having selected Japanese-English simultaneous interpreter **20***c*, and "connection destination of microphone of SI" indicates a VR user to be a connection destination of a microphone of Japanese-English simultaneous interpreter **20***c*. Note that "GU" stands for Japanese guide **20***a* and "SI" stands for Japanese-English simultaneous interpreter **20***c*.
(282) As indicated in operation mode explanation table **411**, state "questions not allowed by anyone" **415***a* corresponds to when the "guide's instruction" is "questions not allowed", in which case "VR display state (Guide)" is "questions not allowed", "VR display state (SI)" is "questions not allowed", "VR mute function (G)" is "muted", "VR mute function (SI)" is "muted", and "connection destination of microphone of SI" is toward a VR user having selected Japanese-English simultaneous interpreter **20***c* ((d) in FIG. **28**).
(283) State "guide-user questions allowed" **415***b* corresponds to when the "guide's instruction" is "questions allowed" with respect to Japanese guide **20***a* and "VR display state (Guide)" is "questions allowed", in which case "VR display state (SI)" is "questions not allowed", "VR mute function (G)" is "muted", "VR mute function (SI)" is "muted", and "connection destination of microphone of SI" is toward a VR user having selected Japanese-English simultaneous interpreter **20***c* ((d) in FIG. **28**).
(284) State "guide-user question in progress" **415***c* corresponds to when the "guide's instruction" is "questions allowed" with respect to Japanese guide **20***a* and "VR display state (Guide)" is "question in progress", in which case "VR display state (SI)" is "questions not allowed", "VR mute function (G)" is "unmuted", "VR mute function (SI)" is "muted", and "connection destination of microphone of SI" is toward a VR user having selected Japanese-English simultaneous interpreter **20***c* ((e) in FIG. **28**).
(285) State "interpreter-user questions allowed" **415***d* corresponds to when the "guide's instruction" is "questions allowed" with respect to Japanese-English simultaneous interpreter **20***c*, "VR display state (Guide)" is "questions not allowed", and "VR display state (SI)" is "questions allowed", in

which case “VR mute function (G)” is “muted”, “VR mute function (SI)” is “muted”, and “connection destination of microphone of SI” is toward a VR user having selected Japanese-English simultaneous interpreter **20***c* ((d) in FIG. **28**).
(286) State “interpreter-user question in progress” **415***e* corresponds to when the “guide's instruction” is “questions allowed” with respect to Japanese-English simultaneous interpreter **20***c*, “VR display state (Guide)” is “questions not allowed”, and “VR display state (SI)” is “question in progress, in which case “VR mute function (G)” is “muted”, “VR mute function (SI)” is “unmuted”, and “connection destination of microphone of SI” is toward a VR user having selected Japanese guide **20***a* ((f) in FIG. **28**).
(287) FIG. **29** is a block diagram illustrating a detailed configuration of VR tourism system **5***a* according to Variation 1 of Example 4. VR tourism system **5***a* has a configuration created by including third guide's terminal **210***c* for Japanese-English simultaneous interpreter **20***c* in place of second guide's terminal **210***b* and newly adding audio switcher **350** to VR cloud **300***e* in the configuration of VR tourism system **5** according to Example 4 illustrated in FIG. **24**.
(288) In other words, VR tourism system **5***a* according to the present variation has a similar configuration to Example 1 illustrated in FIG. **24**. As illustrated in FIG. **28**, a main difference is that the number of types of guide instructions increases from two to three, Japanese-English simultaneous interpreter **20***c* is unable to issue instructions, there are five states due to combination of three guide instructions and operations of VR users **10** to **13** and, in accordance with the states, an operation of audio switcher **350** of VR cloud **300***e* is changed by VR tourism service manager **340**.
(289) FIG. **30** is a diagram illustrating an operation flow example of VR tourism system **5***a* (in other words, a specific example of a video display method) according to Variation 1 of Example 4. More specifically, (a) in FIG. **30** illustrates an operation flow of VR systems **100**, **110**, **120**, and **130** and (b) in FIG. **30** illustrates an operation flow of VR cloud **300***e*.
(290) In each of VR systems **100**, **110**, **120**, and **130**, main processing, interrupt processing of input from VR users, and interrupt processing from VR cloud **300***e* are the same as in Example 4 (not illustrated).
(291) In addition, in VR systems **100**, **110**, **120**, and **130**, initialization processing ((a) in FIG. **30**) by which a VR user starts using VR tourism is the same as the operation flow (S**100** to S**105**) according to Example 3 illustrated in (b) in FIG. **17** and a description thereof will be omitted.
(292) In VR cloud **300***e*, as main processing, as illustrated in (b) in FIG. **30**, VR tourism service manager **340** accepts a “guide's instruction” (a transition to “questions not allowed” and a transition to “questions allowed GU”, “questions allowed IU”) from an APP of smartphone **210** or from guide's remote controller **230** or the like (S**180**).
(293) In addition, VR tourism service manager **340** determines the accepted “guide's instruction” and sorts instructions into the following three types of processing.
(294) Specifically, when the “guide's instruction” is “questions allowed GU” (Y in S**181**), VR tourism service manager **340** sets the “guide's instruction” to “questions allowed GU” (S**185**), notifies all VR systems **100** and the like of the GU (S**186**), notifies “questions not allowed” to all VR systems **110** and the like of the IU (S**187**), and returns to step S**180**.
(295) In addition, when the “guide's instruction” is “questions allowed IU” (Y in S**182**), VR tourism service manager **340** sets the “guide's instruction” to “questions allowed IU” (S**190**), notifies all VR systems **110** and the like of the IU (S**191**), notifies “questions not allowed” to all VR systems **100** and the like of the GU (S**192**), and returns to step S**180**.
(296) When the “guide's instruction” is neither “questions allowed GU” (N in S**181**) nor “questions allowed IU” (N in S**182**), VR tourism service manager **340** sets the “guide's instruction” to “questions not allowed” (S**183**), notifies all VR systems **100** and the like (S**184**), and returns to step S**180**.
(297) In addition, as login processing of VR cloud **300***e*, as illustrated in (b) in FIG. **30**, VR tourism

service manager **340** acquires a user ID and a password from VR systems **100**, **110**, **120**, and **130** and checks whether a user is a legitimate user of the present tourism service (S**160**).
(298) When the user is not a legitimate user (N in S**161**), VR tourism service manager **340** transmits an error to corresponding VR system **100** or the like (S**162**) and returns to step S**160**. When the user is a legitimate user (Y in S**161**), VR tourism service manager **340** acquires a value of the corresponding user from user management table **330***a* (S**163**).
(299) When the acquired language selection of the user is the same as the language of the first guide (the language (Japanese) of Japanese guide **20***a*) (Y in S**165**), VR tourism service manager **340** connects VR system **100** or the like of the corresponding user to first VR audio conference unit **310***b* (S**166**) and jumps to step S**170**.
(300) On the other hand, when the acquired language selection of the user is the same as the language of Japanese-English simultaneous interpreter **20***c* (Y in S**167**), VR tourism service manager **340** connects VR system **100** or the like of the corresponding user to second VR audio conference unit **310***c* (S**168**) and jumps to step S**170**.
(301) When the acquired language selection of the user is neither the language of the first guide (language (Japanese) of Japanese guide **20***a*) (N in S**165**) nor the language of Japanese-English simultaneous interpreter **20***c* (N in S**167**), VR tourism service manager **340** executes default language selection processing (S**169**) and returns to step S**165**.
(302) After connecting VR system **100** or the like of the corresponding user to first VR audio conference unit **310***b* or second VR audio conference unit **310***c* (S**166**, S**168**), VR tourism service manager **340** transmits the fact that preparation for use of the tourism service has been normally completed to corresponding VR system **100** or the like (S**170**) and ends processing.
(303) In default language selection processing (S**169**), for example, VR tourism service manager **340**: A) causes the corresponding user to select the language of the first guide (for example, the language (Japanese) of Japanese guide **20***a*) or the language of the simultaneous interpreter (for example, the language (English) of Japanese-English simultaneous interpreter **20***c*); B) selects English when the language of the first guide or the second guide is English; or C) selects the language of the first guide (for example, the language (Japanese) of Japanese guide **20***a*).
(304) As described above, even with VR tourism system **5***a* according to the present variation, explanations and conversations accommodating a plurality of languages by a simultaneous interpreter are supported and the problem (4) described above is solved.

Variation 2 of Example 4

(305) Next, Variation 2 of Example 4 will be described.
(306) FIG. **31** is a schematic configuration diagram of VR tourism system **5***b* according to Variation 2 of Example 4. VR tourism system **5***b* corresponds to a third specific example that solves the problem (4) (a plurality of languages and a plurality of guides must be accommodated with respect to participants in VR tourism in order to accommodate foreign travel and foreigners) described above.
(307) VR tourism system **5***b* is a system that accommodates VR tourism with a function of machine translation and has a configuration in which, in the configuration of VR tourism system **2** according to Example 1 illustrated in FIG. **3**, machine translator **360**, machine translation management table **333**, and user management table **330***b* are added to VR audio conference unit **310***d* of VR cloud **300***f*.
(308) Machine translator **360** is an example of machine translators **66***a* to **66***b* according to the embodiment which perform machine translation between the first language and the second language. Machine translation management table **333** is an example of machine translation management information **73** according to the embodiment and is an information table that records, for an ID (translation processing module ID "MT-ID") of each of a plurality of translation processing modules included in machine translator **360**, a correspondence between the first language being a translation source ("Language-S") and the second language being a translation

destination (“Language-D”). User management table **330***b* is an example of language information **72** according to the embodiment and is an information table that records a language used by a guide (“Guide Language”), a default language (“Default Language”), a language of use (“Language”) for each VR user (“User-ID”), a translation processing module ID for the guide (“MT-ID-S”), and a translation processing module ID for the VR user (“MT-ID-D”).

(309) As illustrated in FIG. **31**, while VR tourism system **5***b* according to the present variation has approximately the same configuration as the schematic configuration diagram of VR tourism system **2** according to Example 1 illustrated in FIG. **3**, VR audio conference unit **310***d* of VR cloud **300***f* includes machine translator **360**, machine translation management table **333** for selecting machine translation means to be used for each VR user **10** to **13**, and user management table **330***b*.

(310) In the present variation, since the guide is Japanese guide **20***a*, VR users **000001** to **000003** are Japanese users and therefore do not use machine translation as indicated in user management table **330***b*. VR user **000004** and VR user **000005** are English users and therefore use translation processing modules (of which MT-IDs are **01** and **02**) for Japanese-English translation. Although VR user **000006** is a French user, since machine translator **360** does not have a French-Japanese translation function, English that is the default language is selected and the same setting as VR user **000004** and VR user **000005** is applied. Similarly, with respect to VR user **000008**, since machine translator **360** does not support Thai, same Japanese-English translation as VR user **000006** is selected. VR user **000007** is a Chinese user and therefore translation processing modules (of which MT-IDs are **05** and **06**) for Japanese-Chinese translation are selected.

(311) Using VR tourism system **5***b* described above, although there is a possibility that a problem of accuracy of machine translation may exist, both Japanese users and non-Japanese users can experience guided VR tourism in his/her own language or in a default language.

(312) FIG. **32** is a diagram illustrating an example of a use case that is realized by VR tourism system **5***b* according to Variation 2 of Example 4. More specifically, (a) in FIG. **32** illustrates a case where VR tourism by an English guide at a foreign (Egypt **428***a*) tourist destination is provided to not only VR users in English-speaking countries **428***c* but also to VR users in Japan **428***b* via machine translator **360**, (b) in FIG. **32** illustrates a case where VR tourism by a Thai guide at a tourist destination in Japan **429***a* is provided to foreign VR users (not only VR users in Thailand **429***c* but also VR users in Vietnam **429***b* via machine translator **360**), and (c) in FIG. **32** illustrates a case where VR tourism by an English guide at a foreign (Egypt **430***a*) tourist destination is provided to not only VR users in English-speaking countries **430***d* but also to VR users in Japan **430***b* via machine translator **360**, to VR users in Vietnam **430***c* via machine translator **360**, and to VR users in French-speaking countries **430***e* via machine translator **360**.

(313) As illustrated in FIG. **32**, with VR tourism system **5***b* according to the present variation, if Japanese guide **20***a* and Japanese-English simultaneous interpreter **20***c* can cooperate with each other to provide explanations in their respective languages, the use case to be realized described with reference to FIG. **20** becomes realizable.

(314) FIG. **33** is a diagram for describing detailed functions of machine translator **360** included in VR tourism system **5***b* according to Variation 2 of Example 4. More specifically, (a) in FIG. **33** is a block diagram illustrating a detailed configuration of VR audio conference unit **310***d*, (b) in FIG. **33** illustrates a configuration (machine translators **360***a* to **360***d*) of translation processing module group **370** included in machine translator **360** illustrated in (a) in FIG. **33**, (c) in FIG. **33** illustrates machine translation management table **333** illustrated in (a) in FIG. **33**, and (d) in FIG. **33** illustrates user management table **333***b* illustrated in (a) in FIG. **33**.

(315) As illustrated in (a) in FIG. **33**, VR audio conference unit **310***d* includes user management table **330***b*, machine translation management table **333**, a guide instruction recorder, machine translator **360**, and audio mixer **313**. Machine translator **360** is a group of machine translators **360***a* to **360***d* that performs machine translation from a first language to a second language for each VR user **10** to **13**.

(316) Each of machine translators **360***a* to **360***d* includes: audio decoder **361***a* that decodes audio data sent from corresponding VR system **100** or the like; translation processing module group S (**361***b*) that translates the decoded audio data into a language corresponding to a guide (in the present variation, Japanese guide **20***a*); audio compressor **361***c* that compresses the obtained audio data and outputs the compressed audio data to audio mixer **313**; audio decoder **362***a* that decodes audio data sent from guide's terminal **210***a* and the like; translation processing module group D (**362***b*) that translates the decoded audio data into a language corresponding to a VR user; and audio compressor **362***c* that compresses the translated audio data and sends the compressed audio data to corresponding VR system **100** or the like. Audio mixer **313** mixes pieces of audio data in translated languages outputted from machine translators **360***a* to **360***d* and sends the mixed audio data to guide's terminal **210***a* and the like.
(317) As illustrated in (b) in FIG. **33**, translation processing module group **370** is a group of translation processing modules to be used as translation processing module group S (**361***b*) and translation processing module group D (**362***b*) illustrated in (a) in FIG. **33** and, as illustrated, translation processing module group **370** is constituted of modules that perform translation from various first languages to second languages such as English to Japanese (“English to Japanese”) and Japanese to French (“Japanese to French”).
(318) In this example, translation processing module group **370** has eight translation functions which are digitized in machine translation management table **333** in (c) in FIG. **33**. As illustrated in (a) in FIG. **33**, since VR systems **100**, **110**, **120**, and **130** of respective VR users **10** to **13** are connected to machine translators **360***a* to **360***d*, a translation processing module used for each VR user is selected based on information in user management table **330***b*, and a result thereof is transmitted to a guide via guide's terminal **210***a* and the like, the guide can listen to questions by each VR user in his/her own language.
(319) An explanation provided by the guide is sent to machine translators **360***a* to **360***d* for each VR user via guide's terminal **210***a* and the like, translated by the translation processing module selected by user management table **330***b*, and subsequently sent to each VR user, thereby enabling each VR user to listen to tourism guidance in his/her own language regardless of the language of the guide.
(320) In the example of user management table **330***b* illustrated in (d) in FIG. **33**, since the language used by the guide is English and the default language is set to English, translation processing modules **01** and **02** that perform Japanese-English translation are selected for users **000001** to **000003**, translation is not required for users **000004** and **000005** being English users, translation processing modules **07** and **08** that perform English-French translation are selected for user **000006** being a French user, translation processing modules **03** and **04** that perform Chinese-English translation are selected for user **000007** being a Chinese user, and while user **000008** is a Thai user, since a translation processing module for Thai is unavailable, the default language of English is selected and machine translation is not set.
(321) FIG. **34** is a block diagram illustrating a detailed configuration of VR tourism system **5***b* according to Variation 2 of Example 4. VR tourism system **5***b* has a configuration comparable to, in the configuration of VR tourism system **2** according to Example 1 illustrated in FIG. **5**, VR audio conference unit **105***a* according to Example 4 that performs two-way audio processing being included in place of VR audio conference unit **105** included in VR systems **100**, **110**, **120**, and **130** and VR audio conference unit **310***d* with a function of performing machine translation being included in place of VR audio conference unit **310** of VR cloud **300**.
(322) In other words, VR tourism system **5***b* according to the present variation includes VR cloud **300***f* including VR audio conference unit **310***d* with a function of performing machine translation. VR audio conference unit **310***d* includes: conversation controller **311**; audio decoder **361***a* that decodes audio data sent from VR system **100** or the like of each VR user; translation processing module group S (**361***b*) that translates the decoded audio data into a language corresponding to a

guide (in the present variation, Japanese guide **20***a*); audio mixer **313** that mixes a plurality of pieces of translated audio data corresponding to the respective VR users; audio compressor **361***c* that compresses the mixed audio data and transmits the compressed audio data to guide's terminal **210***a*; audio decoder **362***a* that decodes audio data sent from guide's terminal **210***a*; translation processing module group D (**362***b*) that translates the decoded audio data into a language corresponding to each VR user; audio compressor **362***c* that compresses the translated audio data and transmits the compressed audio data to corresponding VR system **100** or the like; machine translation management table **333**; user management table **330***d*; and guide instruction recorder **315**.

(323) In VR tourism system **5***b* according to the present variation, VR systems **100**, **110**, **120**, and **130** of each user and translation processing module group **370** (translation processing module group S (**361***b*) and translation processing module group D (**362**D)) are correctly connected based on machine translation management table **333** and user management table **330***b*. In addition, with respect to a VR user of a same language as the language of use of the guide (in the present variation, Japanese guide **20***a*), the VR user engages in conversation with the guide as-is.

(324) In VR tourism system **5***b* according to the present variation, audio translation is performed by VR cloud **300***f* and two-way communication is performed when only a guide who speaks a language that differs from one's own language is present. However, with the exception of this point, VR tourism system **5***b* according to the present variation has the same functions as VR tourism system **2** according to Example 1 illustrated in FIG. **5**.

(325) Based on machine translation management table **333** and user management table **330***b*, VR tourism service manager **340** of VR cloud **300***f* selects a correct translation processing module from translation processing module group **370** using language selection of a VR user, a language of a guide, and a setting of a default language and sets values of each VR user of a translation processing module ID (“MT-ID-S”) for a guide and a translation processing module ID (“MT-ID-D”) for a VR user in user management table **330**.

(326) FIG. **35** is a diagram illustrating an operation flow example of VR tourism system **5***b* (in other words, a specific example of a video display method) according to Variation 2 of Example 4. More specifically, (a) in FIG. **35** illustrates an operation flow of VR systems **100**, **110**, **120**, and **130** and (b) in FIG. **35** illustrates an operation flow of VR cloud **300***f*.

(327) In each of VR systems **100**, **110**, **120**, and **130**, main processing, interrupt processing of input from VR users, and interrupt processing from VR cloud **300***f* are the same as in Example 4 (not illustrated).

(328) In addition, in VR systems **100**, **110**, **120**, and **130**, initialization processing ((a) in FIG. **35**) by which a VR user starts using VR tourism is the same as the operation flow (S**100** to S**105**) according to Example 3 illustrated in (b) in FIG. **17** and a description thereof will be omitted.

(329) Furthermore, in VR cloud **300***f*, main processing is the same as in Example 1 and Example 2 (not illustrated).

(330) As login processing in VR cloud **300***f*, as illustrated in (b) in FIG. **35**, VR tourism service manager **340** first acquires a user ID and a password (S**210**) from VR systems **100**, **110**, **120**, and **130** and checks whether a user is a legitimate user of the present tourism service (S**210**).

(331) When the user is not a legitimate user (N in S**211**), VR tourism service manager **340** transmits an error to corresponding VR system **100** or the like (S**212**) and returns to step S**210**.

(332) When the user is a legitimate user (Y in S**211**), VR tourism service manager **340** acquires a value of language selection of the corresponding user from user management table **330***b* (S**213**).

(333) As a result, when language selection by the corresponding user is the same as the language of guide **20** (Y in S**215**), VR tourism service manager **340** jumps to step S**220**.

(334) When a pair of the language selection by the corresponding user and the language of the guide is in the translation processing modules (Y in S**216**), VR tourism service manager **340** sets a value of the selected pair as translation processing module IDs (“MT-ID-S” and “MT-ID-D”) in

user management table **330***b* of the corresponding user (S**225**), connects audio of corresponding VR system **100** or the like to a translation processing module corresponding to the selected translation processing module ID (S**226**), and jumps to step S**218**.
(335) When the default language selection and the language of the guide are the same (Y in S**217**), VR tourism service manager **340** jumps to step S**220**.
(336) When the default language selection and the language of the guide are different (N in S**217**) and a pair of the language of the guide and the default language is in translation processing (Y in S**230**), VR tourism service manager **340** sets the translation processing module ID in user management table **330***b* of corresponding user as the pair of the language of the guide and the default language (S**231**), connects audio of corresponding VR system **100** or the like to a translation processing module of the selected translation processing module ID (S**232**), and jumps to step S**218**.
(337) When the pair of the language of the guide and the default language is not in translation processing (N in S**230**), VR tourism service manager **340** jumps to step S**220**.
(338) In step S**220**, VR tourism service manager **340** sets two values of translation processing module IDs in user management table **330***b* of the corresponding user to "N/A" (S**220**), connects audio of corresponding VR system **100** or the like to guide's terminal **210***a* and the like (S**221**), and jumps to step S**218**.
(339) In S**218**, VR tourism service manager **340** transmits the fact that preparation for use of the tourism service has been normally completed to corresponding VR system **100** or the like (S**218**) and ends processing.
(340) As described above, even with VR tourism system **5***b* according to the present variation, explanations and conversations accommodating a plurality of languages by machine translator **360** are supported and the problem (4) described above is solved.
(341) Although the video display system and the video display method according to the present disclosure have been described based on the foregoing embodiment and examples, the present disclosure is not limited to the embodiment and examples. Other modes constructed by applying various variations conceivable by a person skilled in the art to the present embodiment and examples or by combining a part of constituent elements of the embodiment and the examples with each other are also included in the scope of the present disclosure unless there is a deviation from the gist of the present disclosure.
(342) For example, while an example in which the video display system according to the present disclosure is applied to a VR tourism system has been described as examples, the video display system according to the present disclosure is not limited to VR tourism systems and can also be applied to a VR experience system that provides virtual experiences such as attending a trade show, making an inspection tour, going on a factory tour, and visiting an art museum, a museum, a zoo, an aquarium, or the like.
(343) In addition, while conversations by audio between participant **10** and the like and guide **20** and the like are assisted by audio conversation units in the embodiment and the like described above, in addition thereto or in place thereof, the conversations may be displayed as subtitles on a display unit of a VR system. To this end, for example, the VR system may be provided with an audio recognizer that recognizes audio of a conversation in real time, a video compositor that causes the display unit of the VR system to display text obtained by the audio recognizer, and the like.
(344) In this case, questions may be accepted by guide **20** from participant **10** and the like in the form of a chat. In a similar manner to the case of audio, guide **20** may control whether to accept or reject chat input using a guide's remote controller.
(345) Furthermore, in Example 4 that accommodates a plurality of languages, machine translators may output text to VR systems instead of outputting audio. Conceivable specific configuration examples include: 1) instead of converting a guide's audio in a single language into another

language, converting the guide's audio into text in the same language and displaying on the VR system; 2) translating the audio into a language that differs from the language of use of the guide, converting the translated audio into text, and displaying on the VR system; 3) when there are a plurality of guides using different languages, converting audio of each guide into text without translating the audio and displaying the translated text on the VR system; and 4) when there are a plurality of guides using different languages, selecting a guide who uses a language that is close to the language to be converted into text, translating audio of the selected guide, converting the translated audio into text, and displaying the text on the VR system. To this end, for example, a VR cloud may be provided with an audio recognizer, a compositor that composites text obtained by the audio recognizer with a 360-degree video, and the like in addition to machine translators.

(346) Propriety of displaying subtitles can be determined by describing and managing information on whether or not subtitles are to be used in user management table **330***a* in FIG. **26**, user management table **330***b* or machine translation management table **333** in FIG. **31**, or user management table **330***b* in FIG. **33** or by having participant **10** or the like select upon use.

INDUSTRIAL APPLICABILITY

(347) The video display system and the video display method according to the present disclosure can be used as a video display system for providing a service for experiencing VR (virtual reality) such as a VR experience system that provides virtual experiences including going on a sightseeing tour, attending a trade show, making an inspection tour, going on a factory tour, and visiting an art museum, a museum, a zoo, an aquarium, or the like.

REFERENCE SIGNS LIST

(348) **1**, **1***a* video display system **2**, **2***a*, **2***b*, **3**, **4**, **4***a*, **5**, **5***a*, **5***b* VR tourism system **10**-**13** participant (VR user) **20** guide (explainer) **20***a* Japanese guide (first explainer) **20***b* English guide (second explainer) **20***a***1** Vietnamese guide (first explainer) **20***b***1** Thai guide (second explainer) **20***c* Japanese-English simultaneous interpreter **30***a*-**30***b* VR system **31** display unit **32** audio processor **33** participant's input unit **40** explainer terminal **40***a* first explainer terminal **40***b* second explainer terminal **41** explainer's input unit **50** observation system **51** camera **52** microphone **60**, **60***a*-**60***d* cloud **61** audio conversation unit **61***a* first audio conversation unit **61***b* second audio conversation unit **62**, **62***a*-**62***d* controller **63** video distributor **64** group audio conversation unit **65** audio switcher **66***a*-**66***b* machine translator **70** blocking information **71** group information **72** language information **73** machine translation management information **100**, **110**, **120**, **130** VR system **101**, **111**, **121**, **131** display **102**, **112**, **122**, **132** input unit **103**, **113**, **123**, **133** VR space generator **104**, **114**, **124**, **134** communicator **105**, **105***a*, **105***b* VR audio conference unit **106** VR remote controller **106***a* VR remote controller with volume adjustment function **107** conversation controller **108** microphone **108***a* A/D converter **108***b* audio compressor **108***c* muter **109** guidance display controller **140** VR glasses **141** motion/position sensor **142** volume button **143** power switch **144** battery **145** power supply control element **146** AV input terminal **147** USB **148** wireless communication element **149** BLE (registered trademark) **150** bus converter **151** GPU **151***a* motion/position detector **151***b* video display processor **152***a*, **152***b* display element **153***a*, **153***b* lens **154** EEPROM **155** RAM **156** CPU **156***a* audio compressor **157***a* microphone **157***b* microphone amplifier **157***c* A/D converter (ADC) **158***a* D/A converter (DAC) **158***b* amplifier **158***c* loudspeaker **158***d* headphone terminal **160** computer/smartphone **161** AV output terminal **162** USB **163** communication element **164** bus converter **165** GPU **165***a* motion/position detector **165***b* VR controller **165***c* VR video decoder **165***d* guidance display generator **165***e* graphics generator **165***f* VR display controller **166** RAM **167** non-volatile memory **168** power switch **169** power supply control element **170** CPU **170***a* multiplexer **170***b* demultiplexer **170***c* audio decoder **170***d* audio playback controller **180** second muter **181** first muter **182***a* audio decoder **182***b* audio mixer **182***c* D/A converter **182***d* loudspeaker **183** AV demultiplexer **184** audio decoder **186** 360-degree video processor **187** volume adjuster **200**, **200***a* observation system **201** communicator **202** capturing unit **203** camera **204** remote controller **205** microphone **206** vehicle **210**, **210***a*-**210***c* smartphone **211** guide instruction generator **211***a*

communicator/CODEC for headset **211***b* input processor **212** input unit **213***a* A/D converter **213***b* audio compressor **213***c* muter **214***a* audio decoder **214***b* D/A converter **215** audio interface **216** microphone **217** loudspeaker **219***a*, **219***b* metadata additional information **220**, **220***a*-**220***c* headset **230**, **230***a*, **230***b* guide's remote controller **240***a*-**240***d* display example using an audio control application **250** VR audio conference unit **300**, **300***a*-**300***f* VR cloud **310**, **310***a*, **310***d* VR audio conference unit **310***b* first VR audio conference unit **310***c* second VR audio conference unit **311** conversation controller **312** audio processor **313** audio mixer **314***a*-**314***d* audio decoder **315** guide instruction recorder **316** audio decoder **317** audio compressor **320**, **320***a* 360-degree video distributor **321** AV demultiplexer **322** audio decoder **323** audio mixer **324** audio compressor **325** AV mixer **330**, **330***a*, **330***b*, **331** user management table **332** guide language management table **333** machine translation management table **340** VR tourism service manager **341***a*-**341***c* group audio conference unit **350** audio switcher **360**, **360***a*-**360***d* machine translator **361***a* audio decoder **361***b* translation processing module group S **361***c* audio compressor **362***a* audio decoder **362***b* translation processing module group D **362***c* audio compressor **370** translation processing module group **400**-**402** screen display example **400***a* “questions not allowed” **401***a* “questions allowed” **402***a* “question in progress” **410**, **411** operation mode explanation table **415** state transition diagram **415***a*-**415***e* state

Claims

1. A video display system that provides a service for an experience of a virtual reality (VR), the video display system comprising: a VR system including a display that displays a VR space that is a video for the VR to a participant who participates in the experience, and an audio processor that receives and outputs voice from and to the participant; an explainer terminal that receives and outputs voice from and to an explainer, the explainer providing an explanation for the experience to the participant in the VR space; a video distributor that distributes a 360-degree video for generating the VR space to the VR system; an audio conversation unit that assists an audio conversation between the participant and the explainer via the VR system and the explainer terminal; and a controller that controls at least one of the VR system, the explainer terminal, the video distributor, or the audio conversation unit, wherein the controller manages an operation mode that selectively takes a first state in which a question from the participant to the explainer is not allowed, a second state in which the question is allowed, and a third state in which the question is being asked, and causes the VR system to display information specifying that the operation mode is the first state, the second state or the third state on the display.
2. The video display system according to claim 1, wherein the participant comprises a plurality of participants, the video display system comprises a plurality of VR systems respectively corresponding to the plurality of participants, and the controller manages the operation mode corresponding to each of the plurality of VR systems, and causes each of the plurality of VR systems to display the information on the display of the VR system.
3. The video display system according to claim 2, wherein the explainer terminal includes an explainer's input unit that receives an operation indicating whether to receive the question, when the explainer's input unit receives an operation of selecting the first state which is a state of not receiving the question, the controller causes each of the plurality of VR systems to display an image indicating the first state on the display of the VR system and mute audio input from a corresponding one of the plurality of participants, and when the explainer's input unit receives an operation of selecting the second state which is a state of receiving the question, the controller causes each of the plurality of VR systems to display an image indicating the second state on the display of the VR system and mute audio input from a corresponding one of the plurality of participants.
4. The video display system according to claim 3, wherein each of the plurality of VR systems

includes a participant's input unit that receives an operation indicating a request for asking the question from a corresponding one of the plurality of participants, and when the participant's input unit of any one of the plurality of VR systems receives the operation indicating the request and the operation mode of the VR system corresponding to the participant's input unit that has received the operation is the second state, the controller causes the VR system to display information specifying that the operation mode is the third state instead of the second state on the display and change the operation mode to the third state by unmuting audio input from the corresponding one of the plurality of participants.

5. The video display system according to claim 4, wherein when the controller causes the VR system to unmute the audio input from the corresponding one of the plurality of participants, the controller causes each remaining VR system excluding the VR system to display the image indicating the first state on the display and change the operation mode to the first state by muting the audio input from the corresponding one of the plurality of participants.

6. The video display system according to claim 3, wherein the explainer's input unit includes a single button for receiving an operation indicating receiving the question and an operation indicating not receiving the question.

7. The video display system according to claim 4, wherein the participant's input unit includes a single button for receiving an operation indicating the request for asking the question and indicating that the question is presently being asked, and an operation indicating that the question is done.

8. The video display system according to claim 2, further comprising: an observation system that generates the 360-degree video by capturing a real world, wherein the observation system includes a microphone that obtains audio of the explainer, and the audio conversation unit assists an audio conversation between the plurality of participants and the explainer, using audio of the explainer obtained by the microphone.

9. The video display system according to claim 2, wherein the controller (i) includes blocking information including permission denial information indicating whether to block the question from each of the plurality of participants to the explainer, and (ii) based on the blocking information, for each participant indicated as being blocked in the permission denial information, causes one of the plurality of VR systems corresponding to the participant to display the image indicating the first state on the display of the one of the plurality of VR systems and change the operation mode to the first state by muting audio input from the participant.

10. The video display system according to claim 2, further comprising: a group audio conversation unit that assists a group audio conversation among two or more participants selected from the plurality of participants, wherein the controller (i) includes group information including affiliation information indicating whether each of the plurality of participants belongs to a predetermined group, and (ii) based on the group information, causes the group audio conversation unit to assist the group audio conversation for participants belonging to a same group, each of the participants being the participant.

11. The video display system according to claim 10, wherein when the operation mode of each of VR systems corresponding to all of the participants belonging to the same group is the first state or the second state, the controller causes the group audio conversation unit to assist the group audio conversation.

12. The video display system according to claim 11, wherein when the operation mode of one of the VR systems corresponding to any one of the participants belonging to the same group changes from the second state to the third state, the controller causes the one of the VR systems to stop assisting the group audio conversation, and for each remaining participant excluding the participant, causes a corresponding one of the VR systems to display the image indicating the first state on the display of the corresponding one of the VR systems and mute audio input from the participant.

13. The video display system according to claim 10, wherein while assisting the group audio conversation, the controller causes VR systems corresponding to the participants belonging to the same group to adjust a volume of at least one of audio from the explainer to the participants belonging to the same group or audio of the group audio conversation.
14. The video display system according to claim 2, wherein the explainer terminal includes: a first explainer terminal that receives and outputs voice from and to a first explainer, the first explainer providing the explanation in a first language; and a second explainer terminal that receives and outputs voice from and to a second explainer, the second explainer providing the explanation in a second language, the audio conversation unit includes: a first audio conversation unit that assists an audio conversation between each of the plurality of participants and the first explainer via the plurality of VR systems and the first explainer terminal; and a second audio conversation unit that assists an audio conversation between each of the plurality of participants and the second explainer via the plurality of VR systems and the second explainer terminal, and the controller (i) includes language information that associates each of the plurality of participants with a language of the explanation desired by the participant, and (ii) based on the language information, for the participant associated with the first language, causes the first audio conversation unit to assist an audio conversation between the participant and the first explainer, and for the participant associated with the second language, causes the second audio conversation unit to assist an audio conversation between the participant and the second explainer.
15. The video display system according to claim 14, wherein the second explainer is a simultaneous interpreter who interprets between the first language and the second language, and the first audio conversation unit also outputs audio from the first explainer to the second explainer.
16. The video display system according to claim 15, further comprising: an audio switcher that switches between outputting audio from the second explainer to the participant associated with the second language and outputting audio from the second explainer to the participant associated with the first explainer and the first language.
17. The video display system according to claim 14, further comprising: a machine translator that machine translates between the first language and the second language, wherein the explainer provides the explanation in the first language, and the controller (i) includes language information that associates each of the plurality of participants with a language of the explanation desired by the participant, and (ii) based on the language information, causes the machine translator to allow the participant associated with the first language to have an audio conversation with the explainer without via the machine translator, and allow the participant associated with the second language to have an audio conversation with the explainer via the machine translator.
18. The video display system according to claim 17, further comprising: a plurality of machine translators each of which translates between different languages, and the controller (i) includes machine translation management information indicating two languages used by each of the plurality of machine translators, and (ii) based on the language information and the machine translation management information, controls the plurality of machine translators such that for each of the plurality of participants, a machine translator that translates between a language associated with the participant and the first language is selected from among the plurality of machine translators and the participant and the explainer have an audio conversation via the machine translator selected.
19. A video display method performed by a video display system that provides a service for an experience of a virtual reality (VR), the video display system including: a VR system including a display that displays a VR space that is a video for the VR to a participant who participates in the experience, and an audio processor that receives and outputs voice from and to the participant; an explainer terminal that receives and outputs voice from and to an explainer, the explainer providing an explanation for the experience to the participant in the VR space; a video distributor that distributes a 360-degree video for generating the VR space to the VR system; and an audio

conversation unit that assists an audio conversation between the participant and the explainer via the VR system and the explainer terminal, and the video display method comprising: managing an operation mode that selectively takes a first state in which a question from the participant to the explainer is not allowed, a second state in which the question is allowed, and a third state in which the question is being asked, and causing the VR system to display information specifying that the operation mode is the first state, the second state or the third state on the display.

20. The video display method according to claim 19, wherein the participant comprises a plurality of participants, the video display system comprises a plurality of VR systems respectively corresponding to the plurality of participants, and in the managing and causing, managing the operation mode corresponding to each of the plurality of VR systems and causing each of the plurality of VR systems to display the information on the display of the VR system.

21. The video display method according to claim 20, wherein the managing and causing includes: based on blocking information including permission denial information indicating whether to block the question from each of the plurality of participants to the explainer, for each participant indicated as being blocked in the permission denial information, causing one of the plurality of VR systems corresponding to the participant to display the image indicating the first state on the display of the one of the plurality of VR systems and changing the operation mode to the first state by muting audio input from the participant.

22. The video display method according to claim 20, wherein the video display system further includes a group audio conversation unit that assists a group audio conversation among two or more participants selected from the plurality of participants, and the managing and causing includes: based on group affiliation information indicating whether each of the plurality of participants belongs to a predetermined group, causing the group audio conversation unit to assist the group audio conversation for participants belonging to a same group, each of the participants being the participant.

23. The video display method according to claim 20, wherein the explainer terminal includes: a first explainer terminal that receives and outputs voice from and to a first explainer, the first explainer providing the explanation in a first language; and a second explainer terminal that receives and outputs voice from and to a second explainer, the second explainer providing the explanation in a second language, the audio conversation unit includes: a first audio conversation unit that assists an audio conversation between each of the plurality of participants and the first explainer via the plurality of VR systems and the first explainer terminal; and a second audio conversation unit that assists an audio conversation between each of the plurality of participants and the second explainer via the plurality of VR systems and the second explainer terminal, and the managing and causing includes: based on language information that associates each of the plurality of participants with a language of the explanation desired by the participant, for the participant associated with the first language, causing the first audio conversation unit to assist an audio conversation between the participant and the first explainer, and for the participant associated with the second language, causing the second audio conversation unit to assist an audio conversation between the participant and the second explainer.

24. The video display method according to claim 20, wherein the explainer provides the explanation in the first language, the video display system further includes a machine translator that machine translates between the first language and the second language, and the managing and causing includes: based on language information that associates each of the plurality of participants with a language of the explanation desired by the participant, causing the machine translator to allow the participant associated with the first language to have an audio conversation with the explainer without via the machine translator, and allow the participant associated with the second language to have an audio conversation with the explainer via the machine translator.