

CLAIMS

What is claimed is:

1. A computer implemented method for managing user communication within a single call session, the computer implemented method comprising:
 - initiating, by a content delivery injection server, a handshake with a video conferencing system to establish a communication session associated with at least one user device;
 - determining an event classification associated with the communication session based on metadata associated with the communication session received from the video conferencing system;
 - identifying at least one pre-recorded media asset from a content library, the identifying based on the event classification and one or more content selection criteria;
 - retrieving, by the content delivery injection server, an access credential and/or application programming interface (API) token provided by the video conferencing system authorizing delivery of third-party content through a waiting-room graphical interface of the video conferencing system;
 - transmitting, by the content delivery injection server, the at least one identified pre-recorded media asset through an API associated with the video conferencing system to the at least one user device;
 - displaying the pre-recorded media asset within the waiting-room graphical user interface prior to initiation of a live video conference, wherein the pre-recorded media asset is dynamically identified and displayed in real time;
 - logging engagement data associated with display of the pre-recorded media asset, the engagement data comprising at least one of duration of viewing, number of participants, or interaction events; and
 - storing, in an engagement database, the logged engagement data for subsequent retrieval and analysis,
 wherein the communication session is maintained without termination and the displaying of the pre-recorded media asset occurs within the existing communication session's established transport and encryption context, without

establishing any parallel media session or renegotiating any session security or transport parameters.

2. The computer implemented method according to claim 1, wherein the initiating of the handshake further comprises authenticating the content delivery injection server to the video conferencing system through a secure token exchange, comprising a WebSocket negotiation, OAuth authorization, and/or mutual Transport Layer Security (TLS) certificate validation.
3. The computer implemented method according to claim 1, wherein determining the event classification further comprises applying a machine-learning classifier to analyze the event metadata and assign a classification.
4. The computer implemented method according to claim 3, wherein the machine-learning classifier is trained using historical engagement data stored in the engagement database, the historical engagement data comprising prior event types, audience sizes, and/or prior user responses to pre-recorded media assets.
5. The computer-implemented method of claim 1, wherein identifying the pre-recorded media asset further comprises retrieving a media identifier and a format descriptor from the content library, the format descriptor specifying codec type, resolution, and duration constraints corresponding to the waiting-room interface of the video conferencing system.
6. The computer implemented method according to claim 1, wherein retrieving the access credential or API token further comprises generating an encrypted request from the content delivery injection server,

transmitting the encrypted request to the video conferencing system, and

receiving a time-limited API token for accessing the waiting-room content delivery endpoint.
7. The computer implemented method according to claim 1, wherein transmitting the pre-recorded media asset through the API further comprises adapting a transmission protocol based on available network bandwidth.

8. The computer implemented method according to claim 1, wherein the displaying further comprises displaying synchronized captions automatically generated from metadata associated with the pre-recorded media asset.
9. The computer implemented method according to claim 1, wherein the displaying further comprises displaying an estimated wait time timer concurrently with playback of the pre-recorded media asset.
10. The computer implemented method according to claim 1, wherein logging engagement data further comprises monitoring playback initiation and termination timestamps and calculating total view duration per participant session.
11. The computer implemented method according to claim 10, wherein the engagement data is transmitted to the engagement database through a secure API and indexed by a session identifier associated with the corresponding communication session.
12. The computer implemented method according to claim 1, further comprising analyzing the stored engagement data to determine performance metrics comprising average view time, completion rate, and/or device type distribution.
13. The computer implemented method according to claim 12, further comprising automatically updating one or more content selection criteria of the audio/visual content selection engine in response to the analyzed engagement data.
14. The computer implemented method according to claim 1, further comprising storing diagnostic data comprising error logs, handshake response times, and delivery latency metrics within a system log repository accessible to an administrative console.
15. The computer implemented method according to claim 1, wherein the event metadata comprises at least one of an event title, description, participant list, and/or organizer identity.
16. The computer implemented method according to claim 1, wherein the content selection criteria comprises provider preferences, advertiser parameters, and/or audience characteristics.

17. The computer implemented method according to claim 1, wherein transmitting the at least one identified pre-recorded media asset is done within the existing session's established transport and encryption context, without establishing any parallel media session or renegotiating security parameters.
18. A computing system for managing user communication within a single call session, the computing system comprising:
 - at least one computing processor; and
 - memory comprising instructions that, when executed by the at least one computing processor, enable the computing system to:
 - initiating, by a content delivery injection server, a handshake with a video conferencing system to establish a communication session associated with at least one user device;
 - determining an event classification associated with the communication session based on metadata associated with the communication session received from the video conferencing system;
 - identifying at least one pre-recorded media asset from a content library, the identifying based on the event classification and one or more content selection criteria;
 - retrieving, by the content delivery injection server, an access credential and/or application programming interface (API) token provided by the video conferencing system authorizing delivery of third-party content through a waiting-room graphical interface of the video conferencing system;
 - transmitting, by the content delivery injection server, the at least one identified pre-recorded media asset through an API associated with the video conferencing system to the at least one user device;
 - displaying the pre-recorded media asset within the waiting-room graphical user interface prior to initiation of a live video conference, wherein the pre-recorded media asset is dynamically identified and displayed in real time;
 - logging engagement data associated with display of the pre-recorded media asset, the engagement data comprising at least one of duration of viewing, number of participants, or interaction events; and

storing, in an engagement database, the logged engagement data for subsequent retrieval and analysis,

wherein the communication session is maintained without termination and the displaying of the pre-recorded media asset occurs within the existing communication session's established transport and encryption context, without establishing any parallel media session or renegotiating any session security or transport parameters.

19. A non-transitory computer readable medium comprising instructions that when executed by a processor enable the processor to execute a computer implemented method, the method comprising:

- initiating, by a content delivery injection server, a handshake with a video conferencing system to establish a communication session associated with at least one user device;
- determining an event classification associated with the communication session based on metadata associated with the communication session received from the video conferencing system;
- identifying at least one pre-recorded media asset from a content library, the identifying based on the event classification and one or more content selection criteria;
- retrieving, by the content delivery injection server, an access credential and/or application programming interface (API) token provided by the video conferencing system authorizing delivery of third-party content through a waiting-room graphical interface of the video conferencing system;
- transmitting, by the content delivery injection server, the at least one identified pre-recorded media asset through an API associated with the video conferencing system to the at least one user device;
- displaying the pre-recorded media asset within the waiting-room graphical user interface prior to initiation of a live video conference, wherein the pre-recorded media asset is dynamically identified and displayed in real time;

logging engagement data associated with display of the pre-recorded media asset, the engagement data comprising at least one of duration of viewing, number of participants, or interaction events; and
storing, in an engagement database, the logged engagement data for subsequent retrieval and analysis,
wherein the communication session is maintained without termination and the displaying of the pre-recorded media asset occurs within the existing communication session's established transport and encryption context, without establishing any parallel media session or renegotiating any session security or transport parameters.