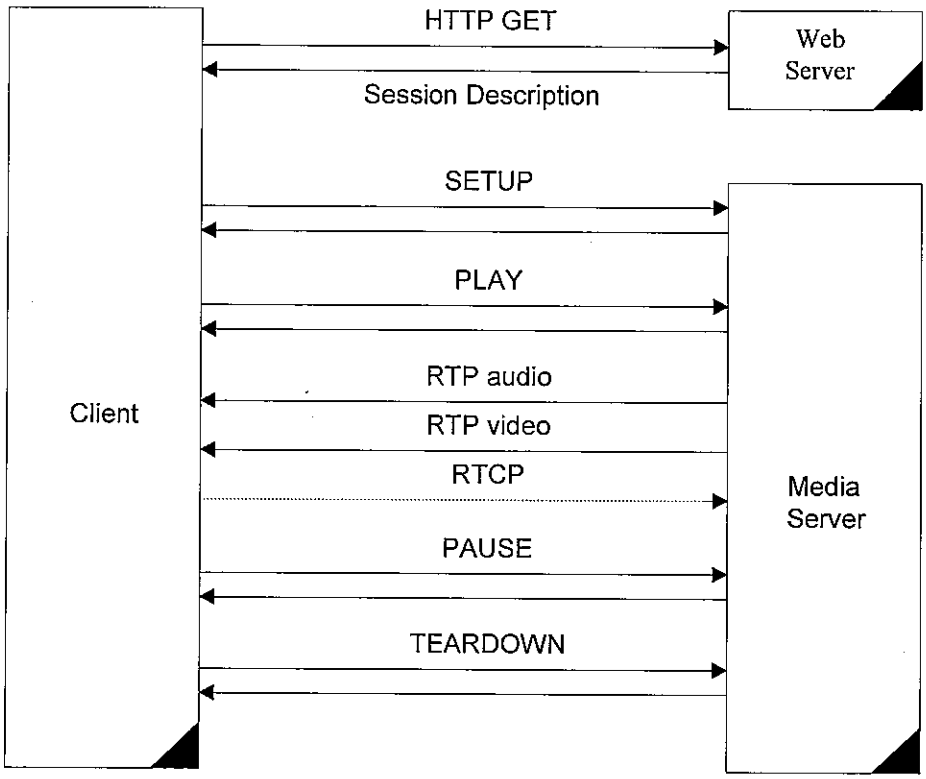

HTTP GET
Web Server
Session Description
SETUP
PLAY
RTP audio
RTP video
RTCP
PAUSE
TEARDOWN
Client
Media Server

FIGURE 1

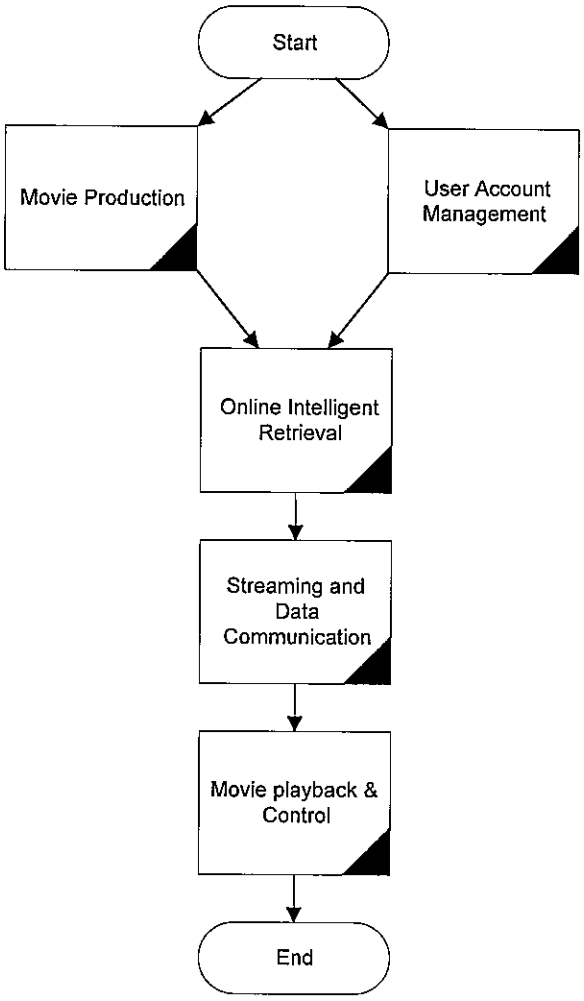

Start
Movie Production
User Account Management
Online Intelligent Retrieval
Streaming and Data Communication
Movie playback & Control
End

FIGURE 2

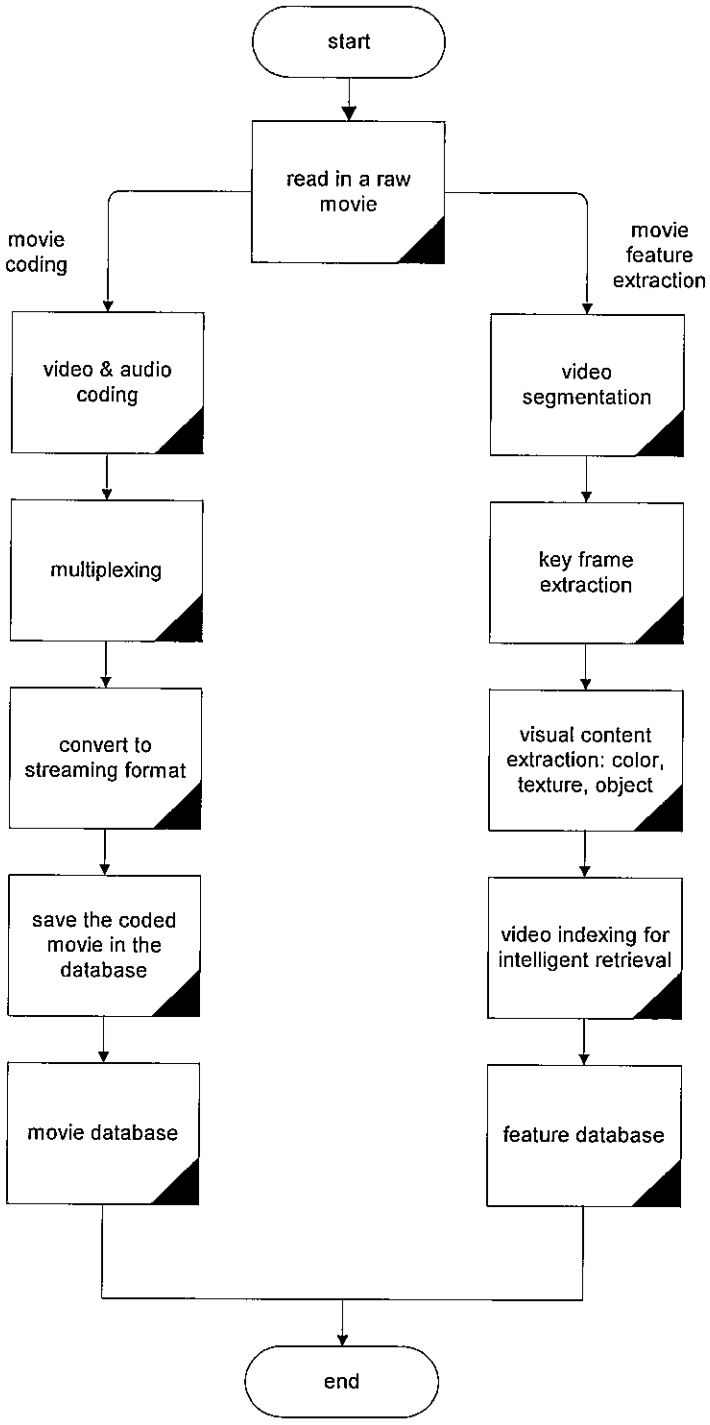

start
read in a raw movie
movie coding
movie feature extraction
video & audio coding
video segmentation
multiplexing
key frame extraction
convert to streaming format
visual content extraction: color, texture, object
save the coded movie in the database
video indexing for intelligent retrieval
movie database
feature database
end

FIGURE 3

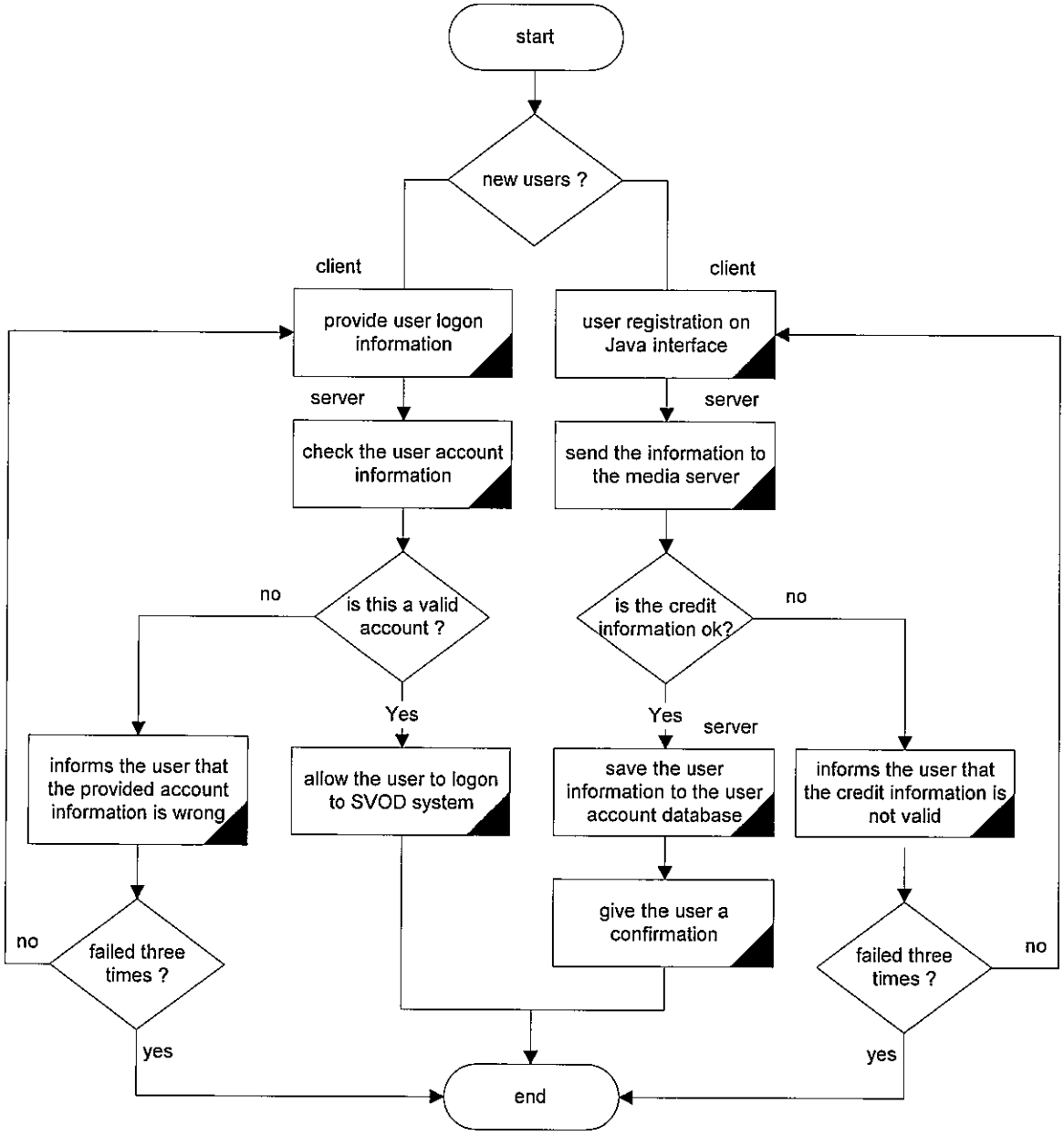

start
new users ?
client
client
provide user logon information
user registration on Java interface
server
server
check the user account information
send the information to the media server
is this a valid account ?
is the credit information ok?
no
no
Yes
Yes
server
informs the user that the provided account information is wrong
allow the user to logon to SVOD system
save the user information to the user account database
informs the user that the credit information is not valid
give the user a confirmation
failed three times ?
failed three times ?
no
no
yes
yes
end

FIGURE 4

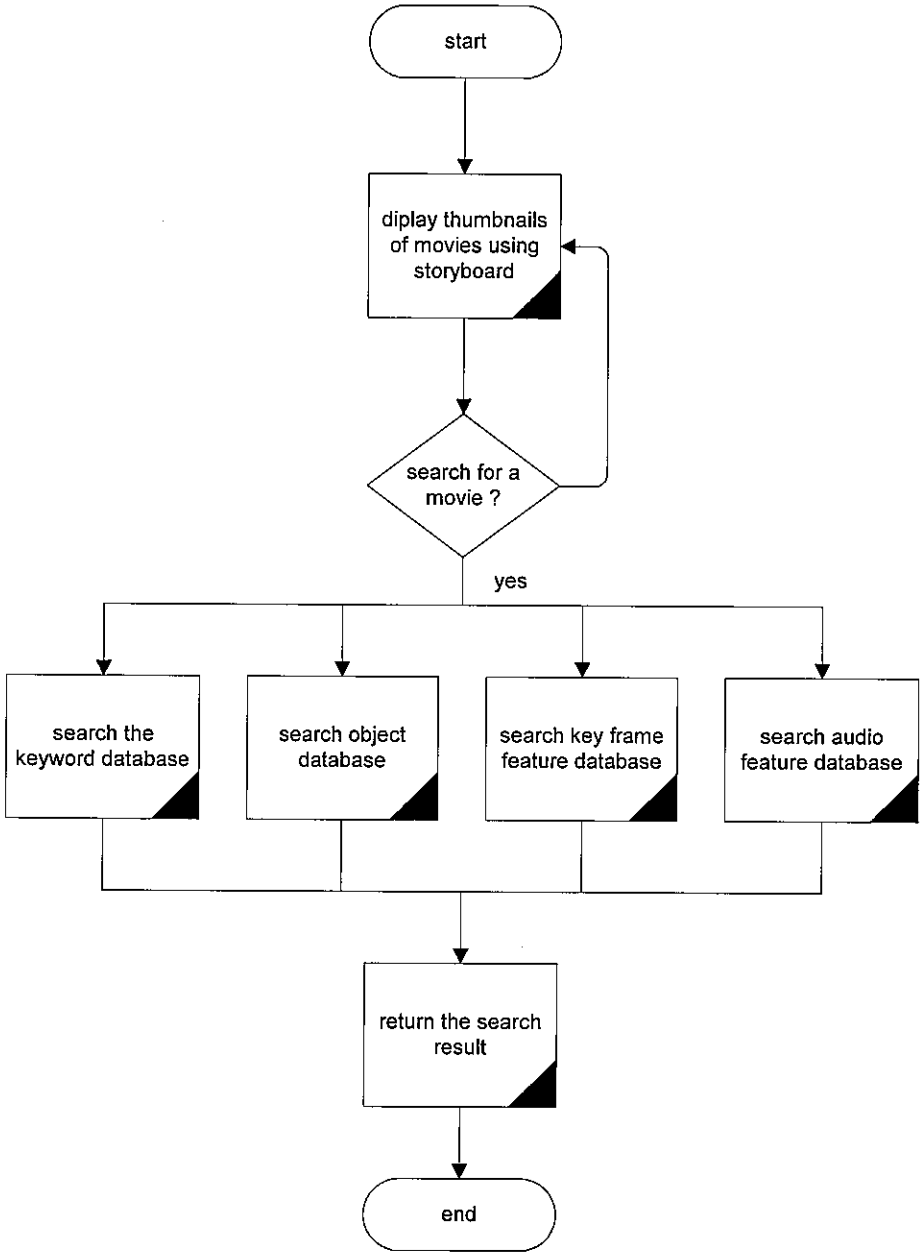

start
diplay thumbnails of movies using storyboard
search for a movie ?
yes
search the keyword database
search object database
search key frame feature database
search audio feature database
return the search result
end

FIGURE 5

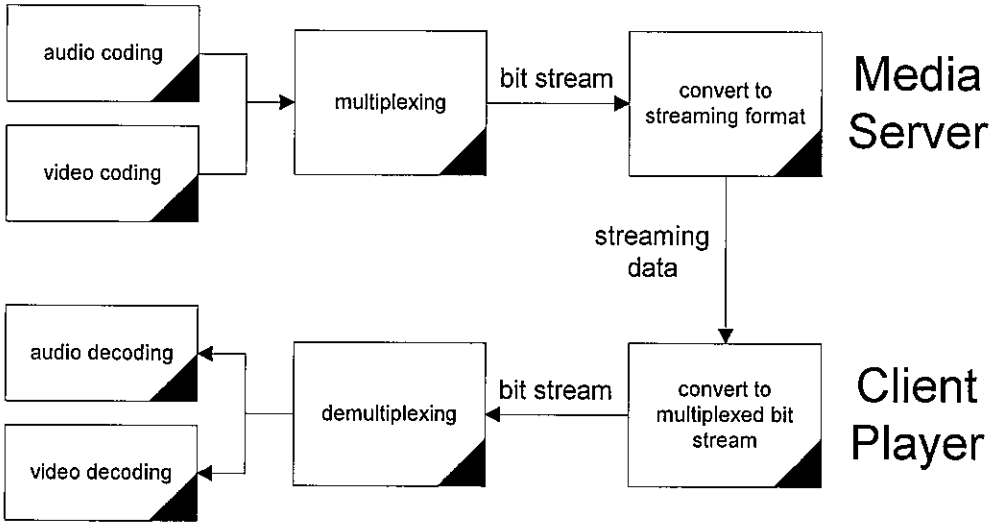

audio coding
video coding
multiplexing
bit stream
convert to streaming format
Media Server
streaming data
audio decoding
video decoding
demultiplexing
bit stream
convert to multiplexed bit stream
Client Player

FIGURE 6

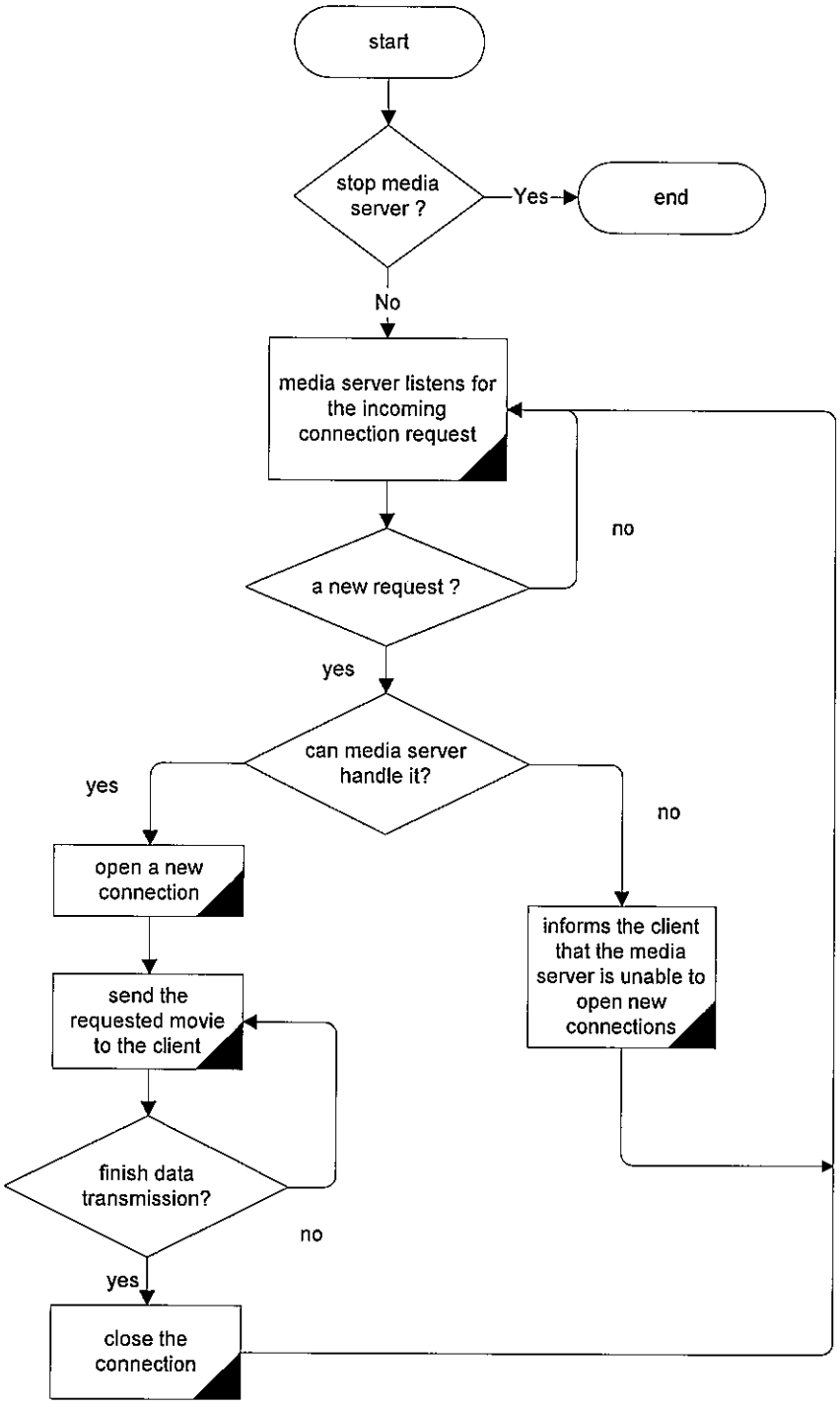

start
stop media server ?
Yes
end
No
media server listens for the incoming connection request
no
a new request ?
yes
can media server handle it?
yes
no
open a new connection
informs the client that the media server is unable to open new connections
send the requested movie to the client
finish data transmission?
no
yes
close the connection

FIGURE 7

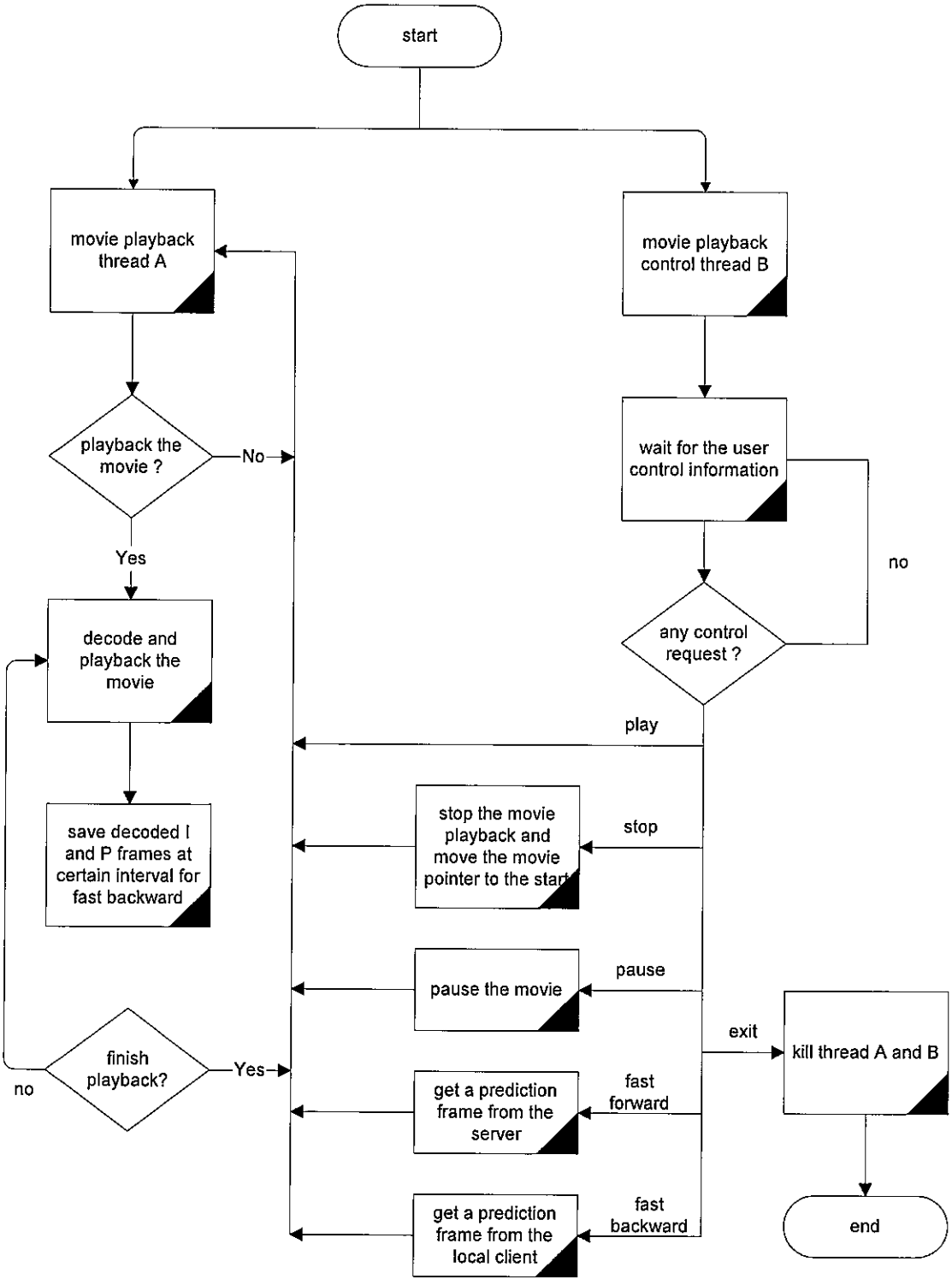

start
movie playback thread A
movie playback control thread B
playback the movie ?
No
Yes
wait for the user control information
no
any control request ?
decode and playback the movie
play
save decoded I and P frames at certain interval for fast backward
stop the movie playback and move the movie pointer to the start
stop
pause the movie
pause
exit
kill thread A and B
finish playback?
no
Yes
get a prediction frame from the server
fast forward
get a prediction frame from the local client
fast backward
end

FIGURE 8

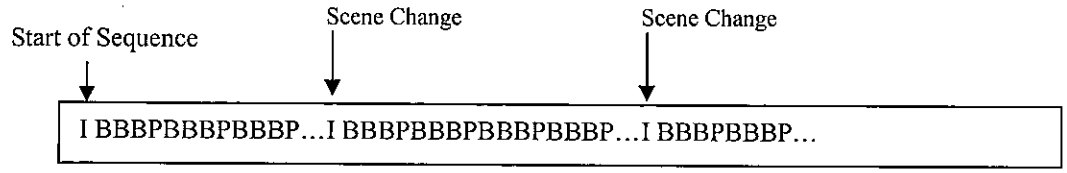


FIGURE 9

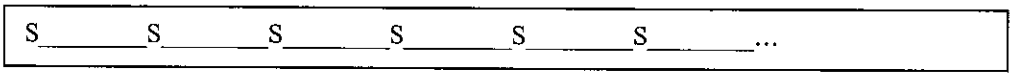


FIGURE 10

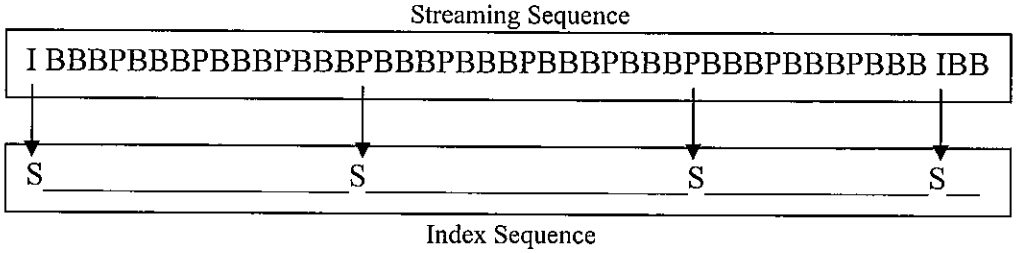


FIGURE 11

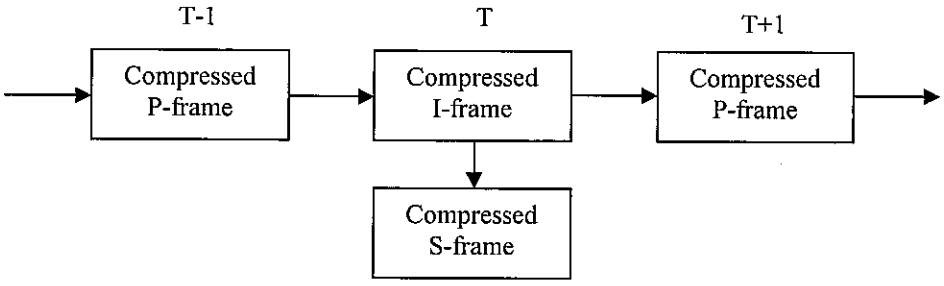


FIGURE 12

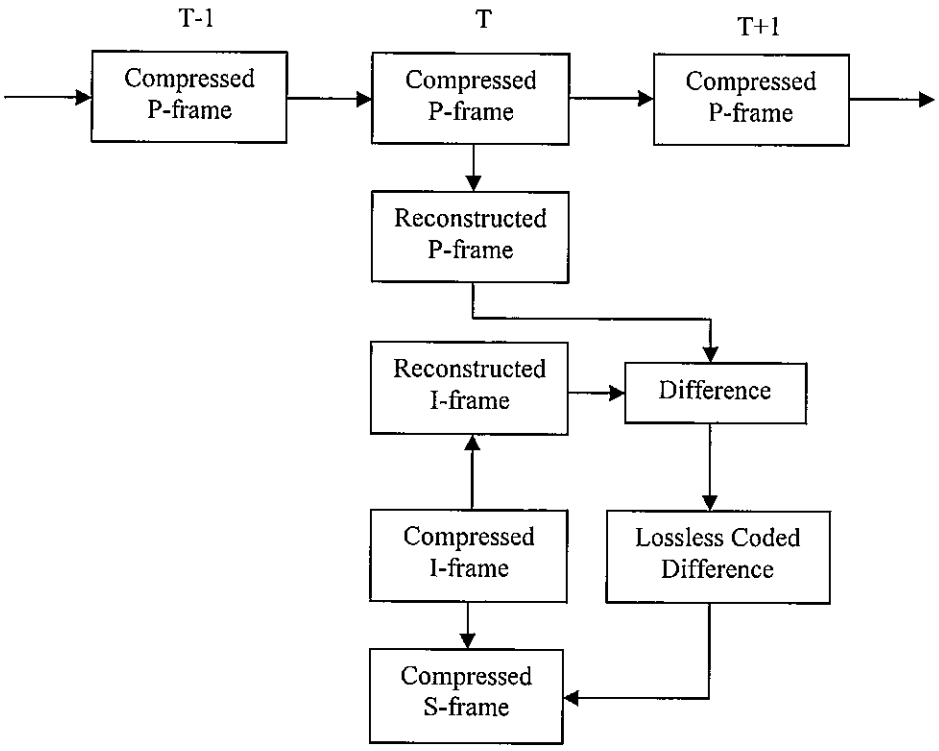


FIGURE 13

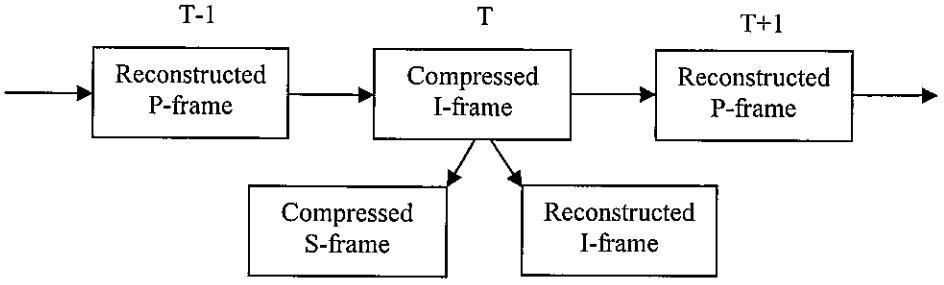


FIGURE 14

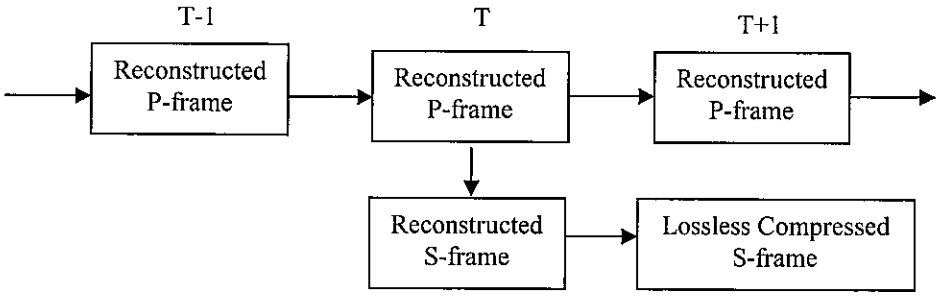


FIGURE 15

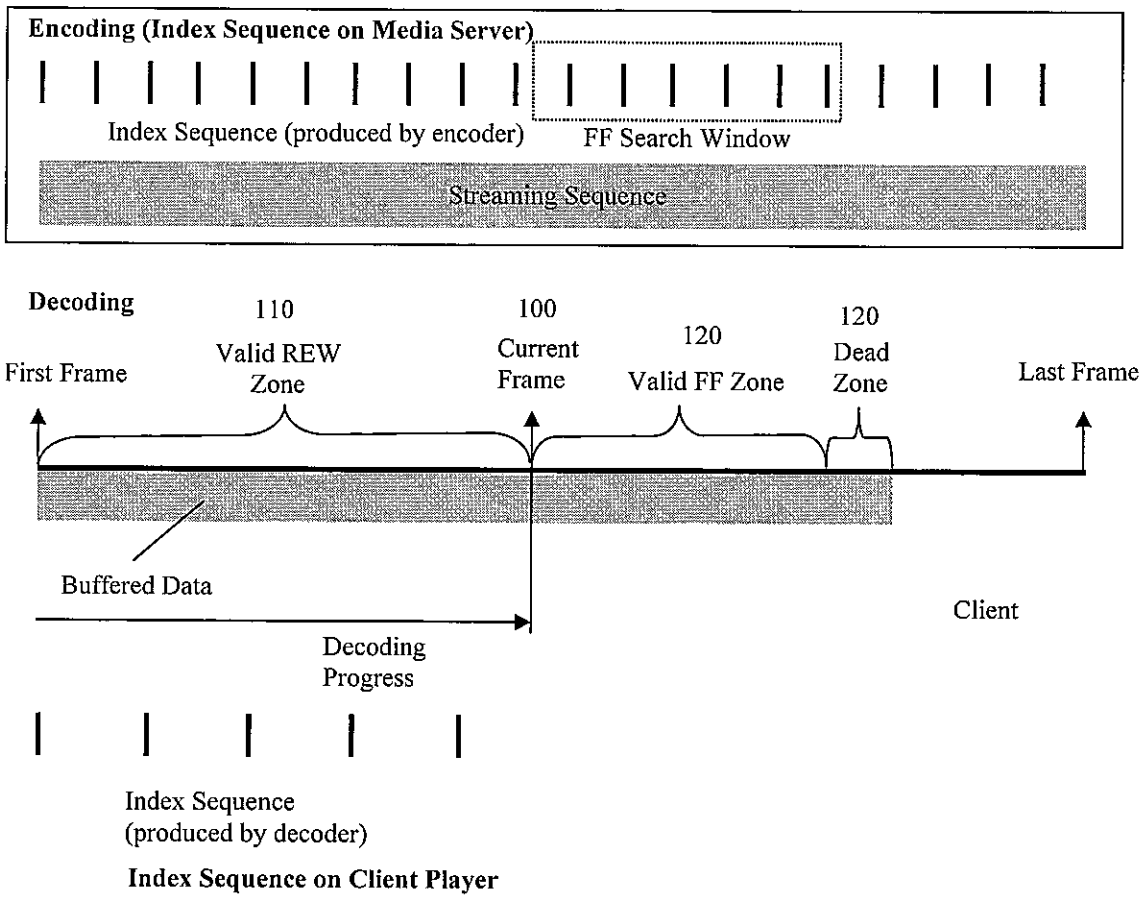


FIGURE 16