LOCATION BASED AUGMENTED REALITY ON MOBILE DEVICES

This invention relates to computer implemented methods and systems for augmented reality on mobile devices, and in particular, methods and systems for mobilization of video, music, photos and other media as augmented reality. Upon a user’s selection of a map marker or other object corresponding to a place in a 2-D or 3-D view, a video or other media item is dynamically encoded for the user's specific device and carrier and played on the user's phone or mobile device or sent to another phone or mobile device. The 2-D or 3-D view may be viewed from within a browser or a separate application.

Declarations under Rule 4.17:
— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(H))
— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(in))

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TITLE: Location Based Augmented Reality on Mobile Devices

PRIORITY CLAIM
This application claims priority of earlier non-provisional US. application No. 13/707,610 filed on December 7, 2012, which is hereby incorporated by reference in its entirety.

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FIELD OF THE INVENTION
This invention relates to computer implemented methods and systems for augmented reality on mobile devices, and in particular, methods and systems for mobilization of video, music, photos and other media as augmented reality.

This invention also relates to computer implemented methods and systems for editing video and other media, and in particular, methods and systems for clipping, transcoding, splicing, and other processes of editing video and other media.

DEFINITIONS
The following abbreviations and defined terms apply to methods or systems of the inventions described in this document. Abbreviations include but are not limited to acronyms and short hand expressions:

- AMR adaptive multirate (audio)
- CCTV closed circuit TV
- DLP digital light processing
- DPI dot per inch
- DSL digital subscriber line
- DTV digital television
- FPD flat panel display
- FPS frames per second
- FTP file transfer protocol
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>GUI</td>
<td>graphical user interface</td>
</tr>
<tr>
<td>HDTV</td>
<td>high definition television</td>
</tr>
<tr>
<td>HTML</td>
<td>hypertext markup language</td>
</tr>
<tr>
<td>IM</td>
<td>instant messag(ing)</td>
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<tr>
<td>IP</td>
<td>internet protocol</td>
</tr>
<tr>
<td>IR</td>
<td>infrared</td>
</tr>
<tr>
<td>ISP</td>
<td>internet service provider</td>
</tr>
<tr>
<td>LAN</td>
<td>Local area network</td>
</tr>
<tr>
<td>LCD</td>
<td>Liquid crystal display</td>
</tr>
<tr>
<td>LED</td>
<td>Liquid emitting diode (display)</td>
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<tr>
<td>MIDI</td>
<td>musical instrument digital interface</td>
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<tr>
<td>MIME</td>
<td>Multipurpose Internet Mail Extensions</td>
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<tr>
<td>MMS</td>
<td>multimedia messaging service</td>
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<tr>
<td>OEM</td>
<td>original equipment manufacturer</td>
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<tr>
<td>PAN</td>
<td>personal area network</td>
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<tr>
<td>PDA</td>
<td>personal digital assistant</td>
</tr>
<tr>
<td>PIN</td>
<td>personal identification number</td>
</tr>
<tr>
<td>PPI</td>
<td>pixels per inch</td>
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<tr>
<td>PPT</td>
<td>Powerpoint file</td>
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<tr>
<td>PPS</td>
<td>Powerpoint Slideshow</td>
</tr>
<tr>
<td>QCIF</td>
<td>Quarter Common Intermediate Format</td>
</tr>
<tr>
<td>QVGA</td>
<td>Quarter Video Graphics Array</td>
</tr>
<tr>
<td>QXGA</td>
<td>Quantum extended Graphics Array</td>
</tr>
<tr>
<td>RDF</td>
<td>resource description framework.</td>
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<tr>
<td>RFI</td>
<td>request for information</td>
</tr>
<tr>
<td>RSS</td>
<td>RDF Site Summary or Rich Site Summary (an XML format for syndicating web content)</td>
</tr>
<tr>
<td>RTSP</td>
<td>real time streaming protocol</td>
</tr>
<tr>
<td>SD</td>
<td>secure digital (memory)</td>
</tr>
<tr>
<td>SVGGA</td>
<td>Super Visual Graphics Array</td>
</tr>
<tr>
<td>SXGA</td>
<td>Super Extended Graphics Array</td>
</tr>
<tr>
<td>SaaS</td>
<td>Software as a Service</td>
</tr>
<tr>
<td>SMS</td>
<td>short messaging service</td>
</tr>
<tr>
<td>SS</td>
<td>second (time)</td>
</tr>
<tr>
<td>SSR</td>
<td>Small screen rendering</td>
</tr>
<tr>
<td>TEL</td>
<td>telephone</td>
</tr>
<tr>
<td>TFT</td>
<td>thin film transistor</td>
</tr>
<tr>
<td>TV</td>
<td>television</td>
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</tbody>
</table>
Definitions and defined terms include but are not limited to the following:

The term "displayed object" means any object displayed on a device whatsoever including but not limited to one or more items of text, markup language (including HTML, XML, WML, and so on); one or more documents (including RTF, DOC, PDF, and so on); one or more images (including pictures, photos, stills, charts, and so on); and other objects (including text boxes, tables, frames, maps, banners, RSS, and so on); or any combination of objects. The term "displayed object" also means any object that represents any web resource whatsoever and in whatever form including but not limited to audio objects, e.g. music; motion picture or video objects without sound track, e.g. cartoons, animations, silent films, and so on; motion picture or video objects with sound track, e.g. movies, TV shows, music videos, and so on; and/or multimedia objects, e.g. slides with audio, film or video with sound track, presentation with voice over, and so on.

The term "media" means any digital media whatsoever including but not limited to one or more lists, stories, headlines, scores, and so on; one or more songs, tunes, music, and so on; one or more videos, movies, segments, clips, and so on; one or more photos, images, pictures, and so on; one or more items of text, markup language, and so on; or any combination of media. The term "media" also means other forms of content including interactive content such as games, simulations, contests, puzzles, polls, quizzes, surveys, stories where users elect the ending, and so on. For example, digital media text may include text in one or more formats: TXT, RTF, DOC, HTML, XML, and so on. In another example, digital music media may include music in one or more formats: MIDI, MPEG e.g. MP3, WAV, WMF, AMR, and so on. In still another example, digital photo media may include photos, images, pictures and so on, in one or more of the formats: JPEG, GIF, BMP, TIFF, PPT, PPS, PNG and so on. In yet still another example, digital video media may include video in one or more
formats: animated GIF, MOV, WMF, EPS, SWF, FLA, 3GP, and so on.

The term "media center" means any storage of digital media whatsoever including but not limited to an online or offline repository of digital media. For example, an online repository of digital media may include an online service accessible through the internet, wireless networks, or any network whatsoever. For example, an offline repository may include any electronic device whatsoever including a mobile phone or other mobile device. The term "media center" also means any online storage of any combination or grouping of media files including but not limited to media files representing digital content owned by user and uploaded to the media center; digital content acquired online by user whether by purchase, license, promotion, and so on; digital content comprising advertising, marketing, or promotional messages, and so on.

[0010] The term "MIME types" is an Internet standard for describes message content types. MIME messages can contain text, images, audio, video, and other application-specific data. A registry of MIME types is maintained by the Internet Assigned Numbers Authority (IANA). Standards relating to MIME types are developed by the Internet Engineering Task Force (IETF) in the following Request for Comment (RFC) documents:

RFC-822  Standard for ARPA Internet text messages
RFC-2045  MIME Part 1: Format of Internet Message Bodies
RFC-2046  MIME Part 2: Media Types
RFC-2047  MIME Part 3: Header Extensions for Non-ASCII Text
RFC-2048/4289 MIME Part 4: Registration Procedures
RFC-2049  MIME Part 5: Conformance Criteria and Examples
RFC-3459  Critical Content Multi-purpose Internet Mail Extensions (MIME)
RFC-3829  MIME Type Registrations for 3rd Generation Partnership Project (3GPP)
Multimedia files
RFC-4393  MIME Type Registrations for 3GPP2 Multimedia Files
RFC-4337  MIME Type Registration for MPEG-4

The term "group" or "grouping" means any list, collection, mix, assembly, compilation, or collection of any digital media whatsoever. A group or grouping of digital media may comprise one item, several items or many items. In another context, the term "group" or "grouping" also means a group of recipients of one or messages such as a SMS message, a MMS message, and so on.

The term "playlist" means any grouping of media including any form of digital media whatsoever including but not limited to one or more songs or music, one or more videos, one or more photos, pictures or images, one or more items of text, or any combination of media. The term "playlist" also means lists of items (including text or multimedia) comprising scores, highlights, headlines, stock valuations, business metrics, search results, nearby stores or locations, operating hours, real estate comparables, price comparisons, etc. The term "playlist" also means forms of interactive media that may require user response(s) such as quizzes, polls, contests, puzzles, games, and so on. These
playlists may take the form of TEXT, multimedia (TEXT, MUSIC and/or VIDEO), or TEXT or THUMBNAILS with LINKS to multimedia, and so on. For example, a playlist may include music in any formats such as MIDI, MPEG e.g. MP3, WAV, WMA, AMR, and so on. For example, a playlist may include pictures, photos, slides, stills, and so on in any format such as JPEG, GIF, BMP, TIFF, PPT, PPS, PNG and so on. For example, a playlist may include videos, clips, trailers, and so on, in any format such as MOV, WMF, EPS, SWF, PNG, G3P, and so on. However, playlist may include any type of media whatsoever including but not limited to a list of items with links to other media.

Examples include a list of items comprising text with links to additional text or to photos, music, or videos; the list of items may include a series of images with links to additional text or to photos, music or videos; the list of items may include a series of images with accompanying text with each images and/or text having links to photos, music or videos. In the context of pictures, photos, slides, stills, and so on, the terms "slideshow", "photo album", or "face book" may be interchanged with "playlist". In the context of video, the term "movie", "video", "videoshow", "video recording", or "podcast" may be interchanged with "playlist".

The term "screen" means any visual display including but not limited to a CRT, LED, LCD, FPD, TV, HDTV, projection screen, etc., and is used interchangeably with the term "visual display". A screen is capable of displaying M pixels by N lines whereby a screen with 800 pixels by 600 lines is capable of displaying 800 distinct dots on each of 600 lines, or about 480,000 pixels.

The term "screen resolution" means the clarity or sharpness of a display and is signified by the number of dots (pixels) on the entire screen and denoted by M pixels x N lines and is contrasted with unitized "resolution" which is signified by DPI or PPI.

The term "full size screen" means any visual display capable of a screen resolution of at least 800 pixels by 600 lines (e.g. SVGA), and typically has 1024 by 768 pixels (e.g. XGA), or 1248 by 1024 pixels (e.g. SXGA), 2048 by 1536 pixels (e.g. QXGA), and so on. The term "full size screen" also means any visual display regardless of type of hardware including but not limited a CRT, LED, LCD, FPD, TV, HDTV, projection screen, and so on.

The term "miniature size screen" is any screen that has fewer pixels than a full size screen including but not limited to 640 x 480 pixels (e.g. VGA), 320 x 240 pixels (e.g. QVGA), or 352 x 288 pixels (e.g. CIF), or 176 x 144 pixels (e.g. QCIF), and so on. The term "miniature screen" also means any visual display including but not limited a LED, LCD, FPD, TV, HDTV, and so on.

The term "mobilize" means conversion of one or more digital content that are capable of being displayed on a computer with a full size screen, e.g. desktop, laptop or notebook, to a one or more webpages that can be displayed on at least one mobile device with a miniature screen, e.g. PDA, mobile phone, smart phone, and so on. The term "mobilize" also means the conversion of one or more items of digital media that are capable of being displayed on a computer with a full size screen to one or more webpages that can be displayed on both a computer with a full size screen and at least one mobile device with a miniature screen, or that can be displayed on a computer with a full size screen and multiple mobile devices with miniature screens. The term "mobilize" also means creation
of one or more items of digital media that are capable of being displayed on at least one mobile device with a miniature screen, e.g. PDA, mobile phone, smart phone, and so on, with or without benefit of one or more pre-existing webpages as a starting point. As used herein, the term "conversion" includes but is not limited to selecting, arranging, and/or adapting content from one or more existing webpages for display on mobile devices, substituting existing representations of such content with images, pictures, iconographies and/or symbols, and supplementing existing content with additional content such as text, pictures, and so on. As used herein, the term "creation" includes but is not limited to selecting, arranging, and/or adapting content from any source (digital or non-digital) for display on mobile devices.

The term "area code" means digits 1-3 of a 10-digit telephone number representing a unique code that corresponds to a particular geographic area, e.g. 415 is the area code for the city of San Francisco, CA. In a full telephone number, the digits of "area code" typically precede the digits of the "exchange code". The term "area code" may also be known as "city code" and these terms may be used interchangeably.

The term "day" is any day or date whatsoever and can mean any period of time having a 24-hour duration including but not limited to a calendar day, a working day, a day of week, a day of month, a day of year, any holiday, e.g. Valentine's day, New Year's Eve, New Year's Day, Christmas Eve, Christmas Day, Independence Day, and so on. The "term" day may also mean "date" or "calendar date" and these terms may be used interchangeably. See also "time of day" defined below.

The term "country code" means the number, e.g. typically 2 digits, that precedes the telephone number and is a unique code that corresponds to a particular country.

The term "delivery" means delivery in any form whatsoever including but not limited to delivery by voice messages, text messages, IM, email with or without attached documents, multimedia including streaming, tickers, RSS, MMS, WAP push, messaging service, narrowcast, and so on, and may utilize any communication protocol such as IP, mobile IP, FTP, HTTP, HTTPS, and so on.

The term "device" means any electronic device including but not limited to mobile electronic devices or immobile electronic devices that are capable of either one-way or two-way communications including but not limited to cellular phones, handheld radios, pagers, laptop computers, notebook computers, ultra-compact computers, desktop computers, set-top boxes, cable boxes, satellite phones, video phones, PDAs, MP3 players, devices on-board vehicles including but not limited to planes, ships, cars or trucks, and so on, and RFID devices attached to other tangible items such as products, packaging, shelves, displays, signs, exhibits, and so on.

The term "exchange code" means digits 4-6 of a 10-digit telephone number or digits 1-3 of a 7-digit telephone number. In the latter context, the term "exchange code" may also be known as a "prefix", e.g. NXX, and these terms may be used interchangeably. In a full telephone number, the digits of "exchange code" typically follow the digits of the "area code".

The term "identifier" means any information in any form whatsoever that uniquely identifies
a device including but not limited to a telephone number, a device identification number, a device's name, a user's name, a street address, a pre-assigned identification number, a user-defined passcode, a pre-assigned or user-defined username, birthplace, and so on.

The term "internet service provider" means any person or entity whatsoever that provides an access point to the internet including but not limited to telephone companies (including cellular and broadband), telecommunications companies, cable companies, media companies and any other commercial organizations as well as universities and other institutions, not-for-profits, community associations, government entities, and so on.

The term "location based" means a location in some way associated with the mobile device including the current location, a location or locations within a radius of the current location, a predicted future location or locations of a mobile device due to GPS tracking or motion sensors, or a location or locations having proximity to a potential destination or destinations that may be filtered based on time of day, day or week, season and so on. As used herein, the term "location based" can mean a real location or a virtual location.

The term "message" means information in any form whatsoever including but not limited to a text message, picture, photo, cartoon, audio, video, animation, presentation, and so on, and any combination of these forms include multi-media message, audio-video, voice over animation, voice over presentation, pictures or photos with captions, cartoons with captions or call-outs, and so on. For example, a message may be a SMS message, a MMS message, WAP push, an email, an IM, a voice message, or any other type of electronic message. A message can be an advertisement or promotional information pushed by an advertiser to a user's mobile device, a message requested by the user of the device, or any message initiated by any person, organization, or entity. A message may be initiated in response to a specific request or in response to an automated protocol.

The term "narrowcast" means transmission of a RF signal, or the act of transmitting a RF signal, from a source resulting in receipt of the RF signal in relatively small geographical area. A narrowcast can be from any RF source whatsoever including but not limited to a single cell tower, a transmitter, a base station, a repeater station, a two-way radio, a bluetooth source, a RFID source, a NFC source, any electronic device capable of RF transmission, and so on. The geographical area of a narrowcast typically has a maximum range of up to 10 kilometers but may have a lesser or greater range.

The term "near field communication" means transmission of a RF signal, or the act of transmitting a RF signal, from a source resulting in receipt of the RF signal in a small or very small spatial area. A near field communication can be from any source such as an electronic device, a POS device, a RFID source, a NFC source, a microchip, and so on, or any source attached to or embedded in another electronic device. The spatial area of a near field communication typically has a maximum range up to 1 meter but may have a lesser or greater range.

The term "network" means any communications network, any subnetwork (aka "subnet") or any combination of these, including but not limited to ethernet, LAN, WAN, PAN, internet, intranet,
extranet, wired network, wireless network, telephone network, cellular network, cable network, satellite network, a mesh of network connections or access points, and so on, including but limited to transmission via conventional electrical conductors, twisted pair, Cat-V, Cat-10, or Cat-100 cables, coaxial cables, fiberoptic cables, DSL, broadband, light transmission, laser transmission, and RF transmission at any frequency, and so on.

The term "purchase" means any type of acquisition whatsoever including but not limited to outright purchase, subscriptions, payment plans, and so on. The term "purchase" also means both paid acquisitions, e.g. purchases, paid subscriptions, and so on, and non-paid acquisitions (with or without registration) such as downloads, trial versions, shareware, freeware, music or video clips, movie trailers, promotional media, and so on.

The term "telephone number" means a number that corresponds to a particular electronic device including but not limited to a mobile phone, PDA, an electronic device connected to a landline, and so on. A telephone number typically corresponds to an electronic device that is capable of voice communications but also correspond to an electronic device that is capable of voice, facsimile, text, and/or video communications.

The term "time" means the duration of time as measured in seconds from an established point in time to the current time of day as measured in years, days, hours, minutes, seconds, or any combination of these, where a year comprises about 365.25 days, a day comprises 24 hours, an hour comprises 60 minutes, and a minute comprises 60 seconds. By convention, time is often measured as the number of seconds from beginning of 1/1/1980. The term "time" can also mean anything that represents time or has temporal significance, e.g. time of day, time of month, time of year, summer time, and holiday's including St. Valentine's day, New Year's eve, Christmas, the time between thanksgiving and Christmas, etc. See also the term "time of day" defined below.

The term "time of day" means the time of day in any form whatsoever including time of day as measured in hours, or a combination of hours and minutes, e.g. HH:MM, or a combination of hours, minutes, and seconds, e.g. HH:MM:SS, from the beginning of the current day where a day comprises 24 hours, an hour comprises 60 minutes and a minute comprises 60 seconds. The term "time of day" may also be measured in a portion of a 24-hour period that occurs each day such as morning, afternoon, evening, night, breakfast, lunch, dinner, dawn, sunrise, dusk, sunset, and so on.

The term "wireless service provider" means any person or entity whatsoever that provides access to the internet and/or other network(s) including but not limited to telephone companies (including cellular and broadband), telecommunications companies, cable companies, media companies and any other commercial organizations as well as universities and other institutions, not-for-profits, community associations, government entities, and so on. Access may be WIFI (including any type of 802.11 network, e.g. 802.11b, 802.11a, llg, dual-band, etc.), bluetooth (including any type of personal area network), broadband, or any other wireless protocol and may be connected through a wireless access point, a host device with wireless capability, or any other means of access such as a publicly accessible grid of devices (or mesh).
BACKGROUND OF THE PRESENT INVENTION

The prior art includes methods for enabling mobile messaging initiated by a person using an electronic device having a web browser provided the person visits a website with a user interface that calls a server to prepare and send messages to the person or to others via the internet using channels such as email, text messaging (SMS), multimedia messaging (MMS), or WAP Push. Sending text messages via email or SMS is accomplished with relative ease since any mobile phone can receive text. For example, individual carriers allow visitors to a website to send text messages via SMS to mobile phones of its own customers and SMS aggregators allow customers to send text messages via SMS to any mobile phone regardless of carrier network. However, sending media files (not just text) to any mobile phone (not just smart phones) required a novel approach since the on-board software and carrier network varied by mobile phone. To overcome this problem, Robert Salinas et al. disclosed in US patent 8,108,342 and pending applications a computer-implemented method for playing multi-media messages on mobile devices wherein the media is encoded dynamically for the particular mobile device on a particular network, preferably encoded on a remote server.

The prior art also includes methods for enabling mobile messaging from within a computer game or simulation. Instead of a message being displayed adjacent to the game window, a message maybe sent to an alternative channel such as email, IM, text message (SMS), multimedia message (MMS), or WAP push and may be read in the real world or by other players within the game. For example, Salinas et al. in publication No. A1 20100262489 disclose such a method of sending media messages from within computer games, e.g. video clips of a player's performance in the game.

The prior art also includes methods of augmented reality using data from geographical information systems. While many mapping systems display a map marker on a 2-D map corresponding to a street address entered by the user, such information is not augmented reality because buildings already have street numbers. In examples of true augmented reality, Mapquest, Google Maps and Google Earth, and Bing display map markers with corresponding business names, phone numbers, web addresses. At least one of these mapping services also include a link to a more information but such information is limited to text and photo about the destination. At least one of these mapping services provide maps in 2-D and views in 3-D maps and use augmented reality to display map markers using symbols (e.g. housing, dining, post office, church, etc.) and corresponding names at the location of the hotels, food establishments, schools, churches, libraries, other civic facilities and points of interest.

[0039] Regarding augmented reality for mobile devices, the prior art also includes methods of implementing augmented reality (AR) on mobile devices using GPS. For example, US patent no. 7853296 to Yu et al. disclose a method of adding virtual graffiti or other electronic message at real world locations, e.g. doors, such that when a user of a mobile device having privileges to view the graffiti is nearby the door's real world location, the user can view the message.
However, none of the prior art disclose a method of mobile 2D map or a 3D view with a map marker (or other graphical object, symbol, or descriptor) having a link to a media file where the media file is dynamically generated to be played by user on his or her phone or mobile device or sent to another phone or mobile device. Existing online mapping services do not have links to video or other media other than photos. Further, existing online services such as YouTube allow download or streaming of videos to various devices that have installed applications or embedded viewers for viewing streaming video. Such devices include desktops, notebooks and a limited number mobile devices, namely smartphones, which represent approx one half of the total number of mobile phones. For example, YouTube and many other online services allow streaming of videos to such devices (but not all mobile phones). A few online services allow either download or streaming of videos to some mobile phones (but not all mobile phones) because these services require an application on the mobile phone. For example, cellfish.com and mywaves.com allow either downloads or streaming to mobiles phones (but not all mobile phones). In addition, several services such as mywaves.com allow users to ‘search’ for videos on the desktop and make them accessible to the user. However, these online services are not true search of the internet but are in reality querying a database having a limited number of videos.

Owners of content sites have existing media libraries that they wish to mobilize. The prior art methods, such as that used by YouTube and others, requires owners of websites to convert the video and then put it into their mobile system for people to view. The video is not available to view until it is converted and added to their mobile system. Their mobile videos do not reflect their full content library. However, there may not be interest in every media file (especially user created content) uploaded by every user of a content site.

Thus, mobilizing their whole content library is inefficient and resources are wasted in mobilizing every media file. Even if a relatively small content site could afford to mobilize every file in a batch process, new files are continuously being added, and thus, the mobile content would not be up to date.

Heretofore, approx one-half of the existing mobile phones (those phones which are not smart phones and many other mobile devices) are unable to receive internet videos and other media not generated on the mobile device because of device's software and carrier required encoding of the media to be specific to that device and carrier. Heretofore, no online service enables users the ability to send videos or video clips or other media (or clips of them) to any web-enabled mobile phone.

Online services that provide SaaS applications teach away from installed applications due to cost of technical support and maintenance issues. Nevertheless, a long felt need is an online service to edit video and send video clips to phones and mobile devices (not just smart phones). For example, services such as Flickr and Instagram allow sending of editing and sending of edited photos to phones.
and mobile devices. However, none of these online services allows users to edit or clip videos or other media without an installed application such as a Flash player embedded in the browser or otherwise installed on the device. Further, no browser for mobile phones (other than smartphones) supports a Flash application which typically requires a Flash player. Moreover, even if one version of a browser or other mobile application such as Flash Lite did support some Flash applications through a web interface, the browser or mobile application may not support every Flash application such as those for editing video(s) or media without a full Flash player and/or periodically requiring an update to the browser or mobile application, and thus, leading to maintenance and support issues.

Further, no online service enables users to view a 2-D map or 3-D view with augmented reality in the form of messages and graphical objects on mobile devices or a virtual environment with such messages or graphical objects having links to video and media that a user can play on their phone or send to their mobile device. In particular, no online service enables users to view elements of augmented reality using a heads-up display for mobile devices that include a headset or glasses with relevant motion sensors (e.g. gyro and compass), using a 3-D viewer for mobile phones that have a pre-installed 3-D viewer application with or without relevant motion sensors (e.g. compass), using a media player to play a video clip or show an image of an element from augmented reality for all other mobile phones.

Thus, a long felt need is an online service that allows users to view messages and graphical objects comprising augmented reality in 2D or 3D views through a web interface on any mobile phone and to retrieve and play any media item on his or her mobile phone or device and/or to send the retrieved media item to any mobile phone or mobile device.

Another problem is that existing navigation tools on mobile phones do not optimize potential destinations according to needs of the user of the mobile phone. For example, potential destinations, e.g. points of interest, may be displayed in a menu, on a map, with directions, and so on. Such navigation systems include systems like Garmin, TomTom and so on. However, if any potential destinations display information, the information is typically limited to the size of the visual display or GUI such that a map is cropped and a menu or list truncated or separated in sequential pages. Except for the limited size of visual display, the potential destinations are not filtered, sorted, or otherwise processed without input of additional information or directions from the user. For example, unless the default is set to the current location of the user, the user must select the current location, or if planning a trip, must select a destination. In addition, if unfamiliar with the destination, the user must generally select particular type of destination, e.g. accommodations, hotels, points of interest, stadiums, events and so on. Thus, information about potential destinations are not specifically tailored to the user of the device. For example, patent application US20060085419 by Rosen describes navigation and matching methods for users of mobile phones based on certain geographical variables including cell site zones or GPS as well as other data from profiles based on user input. Except for GPS, these other variables require input by user which is problematic due to concerns about privacy as well as burdensome, and thus, consumers are unlikely to adopt. As a result, the potential
destinations identified by existing methods are suboptimal and often ineffective to assist the user of the device. Heretofore, the prior art does not tailor potential destinations in a manner that provides effective assistance to the user of the device. In particular, except for GPS, the prior art does not utilize methods that are predictive of future destinations using a history of GPS data to determine past destinations, current heading and velocity, thereby can be self-executing, to determine potential future destinations.

SUMMARY OF THE INVENTION

This invention relates to computer implemented methods and systems for augmented reality on mobile devices, and in particular, methods and systems for mobilization of video, music, photos and other media as augmented reality.

An object of the invention is to maximize the value of augmented reality in mobile devices. Augmented reality would be implemented in a minimalist form having only relevant objects added to the 2D map or 3-D view. The 2-D map or 3-D view can be static or in motion. For devices with built-in GPS capability (either real time or frequently updated), relevant objects and images can be inserted in the mobile 2D map or a 3D view using the GPS coordinates of the mobile device to augment reality. If the mobile device includes a headset, goggles, or glasses with a digital compass, the 2D map or 3D view can be oriented to the compass. For devices without the capability to view in 3D, the augmented reality can be viewed in 2D or simply as media via MMS or WAP push. For devices without the capability for compass orientation, the user can receive messages with snapshots of the augmented reality via MMS or WAP Push. It should be noted that augmented reality could be with or without buildings or terrain. Specifically, the augmented reality could use a simulated or recorded background and could show any objects in the foreground as wireframes, or as solid objects, or partially transparent, or another rendering technique, or not at all.

Yet still another object of the present invention is for advertising, marketing, promotion and sales through the augmented reality information with location-based promotional messages, e.g. "Sale", "Grand Opening", "Tonight at ____" and display advertisements on signs, billboards, etc. or even a full video or a video clip at a place. For example, instead of the message simply being displayed in a window adjacent to the 2-D map or 3-D view, the media message can be viewed separately or by others with mobile devices (accompanying an opponent or other participant's message) or as a desirable complement to the game (e.g. highlights or slow motion replay).

Another reason that the present invention is useful for promotion is that web based mobile delivery of media does not have the challenge of developing, installing, and updating applications for a diverse number of mobile devices. A viewer of the simulation could simply select (during the simulation) a particular view to be sent to a channel (e.g. email, IM, SMS, or MMS) for later viewing or viewing by another person.
Another object of this invention is to enable mobile viewing of media by selecting a map marker or other object or link within a 2-D mapping tool or within a 3-D viewing tool either of which can be implemented as part of a browser application or a separate application.

An object of the present invention is to enable a user to acquire internet-accessible media files in their entirely and/or create clips from such media files using a web interface on any web-enabled device including mobile phones.

An object of the present invention is to enable a user to send clips from internet-accessible media files to any mobile phone using a web interface on any web-enabled device including mobile phones.

Another object of the present invention is to enhance the usability of any web-enabled computer or device (including mobile phones) by enabling a user to edit media files via a web interface. For example, the user would prefer to be able to edit media files via a web interface without the need to download or install a special application on the device.

Still another object of the invention is integration of advertising, marketing, promotion and/or sales within a virtual environment be it amplified reality or computer game, simulation, or the like by adding commercial value to the virtual environment without detracting from the entertainment value of same. For example, instead of a message being displayed adjacent to the game window or the link, a message may be sent to an alternative channel such as email, IM, text message (SMS), or multimedia message (MMS).

Another object of the present invention is to allow a user to edit media files stored in that user's online repository using a web interface. For example, a user may retrieve a media file, edit it to create a media file of shorter length or smaller size, and then save the edited media file.

Another object of the present invention is to retrieve media from an internet accessible location and send media (or a clip from the media) to mobile device(s) including mobile phone(s).

Another object of the present invention is enable a users to store copies of internet accessible media, or clips of the media, or links to media if accessible only in streaming format such as webcasts, podcasts, and so on. For example, a user could enter a URL or a website with keywords obtain search results and then select a clip from the streaming media.

Another object of the present invention is user-driven mobilization system wherein media is mobilized as requested by users which provides efficient mobilization process.

One embodiment of the invention involves a method comprising a step of uploading media from a user's computer to an online repository or media center, and a subsequent step of sending a MMS or WAP push message to that user's mobile phone. For example, the step may include user uploading one or more songs to the online repository or media center, and the subsequent step may include user sending MMS or WAP push message containing these songs to that user's mobile device as a playlist. An alternative embodiment of the invention includes a method having a step of purchasing media file(s) and saving media file(s) in an online or offline repository or media center, and a subsequent step of sending a MMS message containing these media to that user's mobile device.
as a playlist. Another alternative embodiment of the invention includes a method having a step of acquiring internet-accessible media file(s) or clips from such media files, saving the original or edited media file(s) to the user's repository, and/or sending media files to mobile phones using MMS, Push, or other methods.

Another embodiment of the invention includes a method having an intermediate step of organizing media file(s) into one or more playlists. A playlist may include a combination of one or more advertisements and one or more media files. These media file(s) can be organized using multiple criteria including artist, genre, album, live shows, and so on. Alternatively, these media file(s) can be organized using by the user. For example, a user may group songs into playlists for different activities or moods such as "party mix", "study mix", "romantic mix", "workout mix", and so on. In another example, the songs or other media are automatically organized into playlists based using multiple criteria including artist, genre, album, and live shows as well as user preferences or behavior. In still another example, the media also include featured or promoted media. In yet another example, the media also include media determined by one or more recommender systems.

In these examples, each song in a playlist may be unique to that playlist or may be part of multiple playlists. In these examples, each playlist may be named by the user or be assigned a unique identifier. In these examples, each song may be uploaded and stored in varied media formats, e.g. MIDI, MP3, WAV, AMR and so on. In the preferred embodiment, each song is converted to a compressed media format such as AMR that is recognizable by mobile phones, and similarly, each picture or photo is converted to a compressed media format such as JPEG, GIF, animated GIF, and so on and each video or movie clip, trailer, promo, and so on is converted to a compressed media format such as 3gp. An example a grouping of media in a playlist is shown in Table 1 below.

Table 1. PlaylistOOI

<table>
<thead>
<tr>
<th>Item</th>
<th>Song Title</th>
<th>Filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>songOO1</td>
<td>songOO1.amr, .mp3, .mid, or .3gp</td>
</tr>
<tr>
<td>2</td>
<td>song002</td>
<td>song002.amr, .mp3, .mid, or .3gp</td>
</tr>
<tr>
<td>3</td>
<td>song003</td>
<td>song003.amr, .mp3, .mid, or .3gp</td>
</tr>
<tr>
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<td></td>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

An example of a grouping of media in a slideshow (a type of "playlist") is shown in Table 2 below:

Table 2. SlideshowOOI
An example of a grouping of media in a videoshow (a type of "playlist") comprising a collection of video clips, movie clips, ad, or podcasts is shown in Table 3 below:

Table 3. Videoshow001

<table>
<thead>
<tr>
<th>Item</th>
<th>Clip Title</th>
<th>Filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>clip001</td>
<td>clip001.3gp, .mpeg</td>
</tr>
<tr>
<td>2</td>
<td>clip002</td>
<td>clip002.3gp, .mpeg</td>
</tr>
<tr>
<td>3</td>
<td>clip003</td>
<td>clip003.3gp, .mpeg</td>
</tr>
<tr>
<td>N</td>
<td>clipNNN</td>
<td>slideNNN.3gp, .mpeg</td>
</tr>
</tbody>
</table>

[0064] An example of a grouping of media in a medialist (a type of generalized "playlist") comprising a collection or list of items of media including stories, reports, scores, headlines, stock valuations, business metrics, product descriptions, product pricing, bestsellers, showtimes, horoscopes, team members, contestants, candidates, nearby store locations, nearby friends or family, real estate comparables, and so on, is shown in Table 4 below:

Table 4. MediaList001

<table>
<thead>
<tr>
<th>Item</th>
<th>Clip Title</th>
<th>Filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MediaList001</td>
<td>medialist001.wml, .html, .gif, or .3gp</td>
</tr>
<tr>
<td>2</td>
<td>MediaList002</td>
<td>medialist002.wml, .html, .gif, or .3gp</td>
</tr>
<tr>
<td>3</td>
<td>MediaList003</td>
<td>medialist003.wml, .html, .gif, or .3gp</td>
</tr>
<tr>
<td>N</td>
<td>MediaListNNN</td>
<td>medialistNNN.wml, .html, .gif, or .3gp</td>
</tr>
</tbody>
</table>
Continuing the examples where a user organized one or more media file(s) in a playlist, the user is presented with alternatives for organizing media. In one embodiment, the user is presented with a choice of one or more templates or forms which have varying levels, e.g. basic versus advanced, novice versus expert, and so on. In other embodiments, the templates or forms may be customizable by the user. For example, the template may allow the user to select a playlist at the time of uploading that user's media file. Alternatively, the user may upload that user's media file and select a playlist at a later time. As a further alternative, the user may elect not to organize media in any playlist or grouping, or to apply a default setting.

After the media are accessible in the online repository, one or more playlists would be sent to that user’s mobile phone. In one embodiment, the playlist is sent to a mobile phone as a MMS message. In another embodiment, the playlist is sent to a mobile phone as an email or IM. In still another embodiment, the playlist is sent to a mobile phone using an alternative network protocol for wireless devices such as Bluetooth or WIFI (aka 802.11). In yet still another embodiment, the playlist is mobilized prior to sending to the mobile phone. For example, each media file processed for playing on a mobile phone (e.g. transcoded) and stored individually. In another example, several individual media files may be processed such that multiple media files (e.g. one or more audio files plus one or more image files or video files) are combined and stored as a composite media file. Media files may be stored in a web accessible location, or stored in a database or other location for subsequent retrieval. In this way, the user may be provided access to each of the individual media files using a web-enabled mobile phone, or the user may be provided access to one or more composite media files, or the user may be provided access to both individual files and the resulting media files. Since the media represented by the displayed object is one file, mobile phones will play the components of the playlist in sequence, and typically, without intervening pauses or stops. Thus, these methods make the mobile phone ideal for playlists whether they be comprised of music, photos, or video clips, or combinations of media.

In addition, a user (including an advertiser or marketer) may schedule the transmission of playlist(s). In one embodiment, the user schedules the time to send the MMS message applicable to each playlist, e.g. NOW, TODAY at NOON, TODAY at 5PM, TOMORROW at 8AM, FRIDAY at 8PM. In still another embodiment, the user schedules a recurring MMS message for one or more playlists. In other embodiments, the user may opt-in to receive additional MMS messages comprising varied media files from third parties and the service may allow the user to schedule when to receive these additional MMS messages. These additional MMS messages may include announcements, promotions, licensed content, and so on.

Still yet another object of the invention is to improve efficiency of information distribution such as that media contain important information can be distributed interested users of mobile devices. Typically, real estate agents, political campaigns, and organizers and promoters of events,
and media and entertainment companies, among others, create hardcopy "flyers", pamphlets, coupons, and similar materials for promotion purposes. In comparison to paper flyers, distributing digital information is inexpensive, requires less time and effort, and does not add to the waste stream. Although the internet partially obviates the need for hardcopy flyers, a need for mobile information still exists and browsing using a mobile phone has inherent limitations. In contrast, MMS messaging is both mobile and overcomes the inherent limitations of browsing. An example of a type of media that can be sent by MMS message to mobile phones is flyers, pamphlets, coupons, and other similar promotional materials.

Such promotional materials may be sent in varied media formats including images, videos, and so on. In one embodiment, one or more such promotional materials are additional MMS messages sent separately to a user's mobile phone. In another embodiment, one or more promotional messages are additional MMS messages sent to the user's mobile phone simultaneously with MMS messages scheduled or requested by the user. In still another embodiment, one or more such promotional messages are intermixed within a user's playlist in a single MMS message. The mobile phone of the user may or may allow user to skip the promotional message but a message produced with high quality content will be heard by many users.

Still yet another object of the invention is for advertising and promotion of manufacturers and vendors of any goods and services that are targeted to a specific geographic location(s) such as southern locations, northern locations, state specific, MSA specific, community specific, resort destination(s), rather than targeted to other users such as specific demographic, e.g. tweens, teenagers, 18-34 year-olds, baby boomers, and so on.

Still yet another object of the invention is integration of targeted media including but not limited to mobile advertising, marketing, campaigning, promotion and/or sales within a mobile communications device to add to the value of the device without detracting from the value of device as a communications tool.

The current invention overcomes the aforementioned problems

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. 1A and 1B are perspective drawings of a 2-D map or 3-D view showing traditional map markers of places on a street grid without showing buildings or terrain.

FIGS. 2A and 2B are perspective drawings of a 2-D map or 3-D view showing traditional map markers of places on a street grid showing buildings but without showing terrain.

FIGS. 3A and 3B are perspective drawings of a 2-D map or 3-D view showing symbols as map markers of places on a street grid without showing buildings or terrain.

FIGS. 4A and 4B are perspective drawings of a 2-D map or 3-D view showing traditional map markers of places on a street grid and a balloon having additional information about a place.

FIGS. 5A through 5F are perspective drawings of a 2-D map or 3-D view showing alternative examples of objects or descriptors of a place on street grid to attract the attention of a viewer.
[0078] FIGS. 6A and 6B are alternative views of user interfaces of mobile phones showing message or webpage with a link to a subsequent webpage to either download or stream encoded media file.

[0079] FIGS. 7A and 7B are schematic drawings of alternative circuits of mobile devices.

[0080] FIGS. 8A, 8B, and 8C are schematic drawings of alternative circuits of other electronic devices including stationary electronic devices.

[0081] FIGS. 9A through 9D are perspective drawings of alternative mobile devices.

[0082] FIG. 10 is a block diagram of media sources and a media center showing pictorial representations of media files and various processes relating to media files.

[0083] FIGS. 11A, 11B and 11C are alternative block diagrams of media sources and a media center showing pictorial representations of media files and various processes relating to media files with a portion(s) of the resulting media files inside the media center and other portions of the resulting media files outside the media center.

[0084] FIGS. 12A, 12B, and 12C are schematic diagrams of alternative combinations of audio files in a single media file.

FIGS. 13A, 13B, and 13C are schematic diagrams of alternative combinations of image files in a single media file.

FIGS. 14A, 14B, 14C, 14D and 14E are schematic diagrams of alternative combinations of video files in a single media file.

FIGS. 15A, 15B, and 15C are flowcharts of alternative processes for processing different types of media files.

FIGS. 15D, 15E, and 15F are flowcharts of alternative subprocesses for combining like media files a single media file.

FIG. 15G is a flowchart of a subprocess for combining one or more video file(s) with one or more audio file(s).

FIGS. 15H through 15M are flowcharts of processes for clipping or editing media file(s) and/or searching for media files from a mobile interface and then sending the edited or resulting media file(s) to mobile devices.

FIG. 16A is a flowchart of a combination of processes for obtaining media (by uploading, browsing and/or acquiring media), organizing media files (by grouping and/or arranging media items in playlists), scheduling transmission of media files, and transmitting playlists to mobile devices and/or other electronic devices.

FIG. 16B is a flowchart of a process to upload media file(s) to an online repository.

FIG. 16C is a flowchart of a process to browse media file(s) and/or play media and/or send a multimedia message and/or save links to a database.

FIG. 16D is a flowchart of a process to acquire media file(s) and/or play media and/or download media and/or send a multimedia message and/or save copies to an online or offline repository or media center.

FIG. 16E is a flowchart of a process to define a new playlist.

FIG. 16F is a flowchart of a process to organize media files in one or more playlist(s).
FIGS. 16G and 16H are alternative flowcharts of processes to schedule transmission of one or more playlist(s).

FIGS. 16I and 16J are alternative flowcharts of processes to transmit playlist(s) comprising one or more media file(s) using MMS or the like.

FIG. 16K is a flowchart of subprocesses of user selection of individual media file(s), a category of media file(s), or media search.

FIG. 16L is a flowchart of a subprocess to grab media from an internet-accessible location or a file storage location.

FIG. 17 is a block diagram of the major processes without showing the subprocesses.

FIGS. 18A through 18E show the front-end of the processes performed on the phone or mobile device.

FIGS. 19A through 19C show the back-end of the processes performed on one or more servers.

FIG. 20A is a flowchart of the subprocess for determining geographic variables including but not limited to location as well as orientation.

FIG. 20B is a flowchart of a subprocess for user action in response to a prompt for action.

FIG. 20C is a flowchart of the subprocess for validating a potential destination including but not limited to filtering a list of potential destinations.

FIG. 20D is a flowchart of a subprocess to request and encode a media file and to play the encoded media file on the phone or mobile device.

FIG. 20E is a flowchart of the subprocess for determining if the current location is a destination.

FIG. 20F is a flowchart of the subprocess for making a record of a destination.

FIGS. 21A through 21D are flowcharts of algorithms for determining featured destinations, personal favorite destinations, mutual favorite destinations, and popular destinations.

FIGS. 22 through 34 are flowcharts of alternative algorithms for prediction of future location or 'future location' prediction.

DETAILED DESCRIPTION OF THE INVENTION

With reference to FIGS. 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B, and 5A through 5F, one or more map markers 150 displayed in a 2-D or 3-D view of a street grid as well as a legend of the places.

FIGS. 1A, 2A, 3A and 4A illustrate the prior art having map markers and names or descriptions of each place but not links to videos or other media files (other than photos). FIGS. 1B, 2B, 3B and 4B illustrate an embodiment of the invention where each mapmarker is linked to at least one media file associated with the particular place or destination. In FIGS. 1B, 3B and 4B, the 2-D or 3-D view does not include buildings or terrain while in FIG. 2B the view includes buildings. FIGS. 1B, 2B, and 4B show traditional map markers while FIG. 3B shows map markers in the form of symbols.

Referring to FIGS. 5A through 5F in various embodiments of the invention the viewer may select a map marker comprising a display ad, a billboard, a balloon, a fireworks or spotlights, or other object rather than a traditional map marker. After selecting the object, the view can request to play a media
file linked to the object or to send the media file or a clip of the media file to a mobile phone or mobile device.

With reference to FIGS. 10, 11A through 11C, 12A through 12C, 13A through 13E, and 14A through 14C, media files are depicted as pictorial diagrams that are combined in various combinations. For example, in FIG. 12A, the methods and systems of the invention describe a combination of two audio files 601 and 602 into a single media file 7NN. In FIG. 12B, the methods and systems of the invention describe a combination of three audio files 601, 602, and 603 into a single media file 7NN. In FIG. 12C, the methods and systems of the invention describe a combination of a plurality of sequences of frames into a single media file 7NN. In one embodiment, the audio files are music files or songs. In another embodiment, one or more the audio files are advertisements, marketing messages or promotions. In still other embodiments, the audio files are segments of radio shows, chapters of talking books, or any other audio files whatsoever. The media file 7NN may be any file format capable of recording audio including but not limited to AAC, AMR, WAV, WMA, MP3, and 3GP.

In FIG. 13A, the methods and systems of the invention include a combination of a sequence of repetitive images 401 comprising a series of frames 1001, 1002, 1003, ..., 1NNN into a single media file 8NN. In FIG. 13B, the methods and systems of the invention include a combination of two sequences of repetitive images 401 and 402 comprising a series of frames 1001, 1002, 1003, ..., 1NNN,...,1NNN+1, 1NNN+2, 1NNN+3, ..., 1NNN+NNN into a single media file 8NN. In FIG. 13C, the methods and systems of the invention include a combination of a plurality of sequences of repetitive images 401, 402, 403, ..., 4NN comprising a series of frames 1001, 1002, 1003, ..., 1NNN,...,1NNN+1, 1NNN+2, 1NNN+3, ..., 1NNN+NNN, 1NNN+NNN+1, 1NNN+NNN+2, 1NNN+NNN+3, ..., 1NNN+NNN+NNN, ..., 1NNN+NNN+NNN+NNN+NNN, 1NNN+NNN+NNN+NNN+NNN+1, 1NNN+NNN+NNN+NNN+NNN+2, 1NNN+NNN+NNN+NNN+NNN+NNN+3, 1NNN+NNN+NNN+NNN+NNN+NNN ... into a single media file 8NN. In one embodiment, the image files 401, 402, 403, ..., 4NN are photos or pictures. In another embodiment, one or more the image files are advertisements, marketing messages or promotions. In another embodiment, one or more of the images are slides from a slideshow. In still other embodiments, one or more of the images are stills from an animation, flashcards, trading cards, entries in a facebook, mugshots or most wanted fugitives, or any other image files whatsoever. The media file 8NN may be any file format capable of recording images including but not limited to PPS, WMF, MOV, MPEG4, and 3GP.

In FIG. 14A, the methods and systems of the invention include a combination of a sequence of frames 501.1, 501.2, 501.3, ..., 501.NNN comprising a series of frames 1001, 1002, 1003, ..., 1NNN into a single media file 8NN and/or 9NN. In FIG. 14B, the methods and systems of the invention include a combination of two sequences of frames 501.1, 501.2, 501.3,..., 501.NNN, ..., 502.1, 502.2, 502.3,..., 502.NNN comprising a series of frames 1001, 1002, 1003, ..., 1NNN,...,1NNN+1, 1NNN+2, 1NNN+3, ..., 1NNN+NNN into a single media file 8NN and/or 9NN. In FIG. 14C, the methods and systems of the invention include a combination of a plurality of sequences of frames...
503.NNN, …, 5NN.1, 5NN.2, 5NN.3, …, 5NN.NNN comprising a series of frames 1001, 1002, 1003,
…, 1NNN+1, 1NNN+2, 1NNN+3, …, 1NNN+NNN, 1NNN+NNN+1, 1NNN+NNN+2,
1NNN+NNN+3, …, 1NNN+NNN+NNN, 1NNN+NNN+NNN+NNN, 1NNN+NNN+NNN+ 1, 1NNN+NNN+NNN+NNN+2,
1NNN+NNN+NNN+NNN+3, 1NNN+NNN+NNN+NNN+NNN into a single media file 8NN and/or 9NN. In one embodiment, a sequence of frames 5NN.1, 5NN.2, 5NN.3, …, 5NN.NNN are a sequence of frames from a video clip or movie trailer. In another embodiment, one or more of the sequences of frames is a video advertisement, marketing messages or promotion. In still other embodiments, one or more of the sequences of frames is an animation, cartoon, simulation, movie, highlights, video on demand, live or recorded media, live of recorded play from video games or virtual worlds, or any video whatsoever. The media file 8NN may be any file format capable of recording images including but not limited to WMF, MOV, MPEG4, and 3GP.

In FIGS. 14D, the methods and systems of the invention include insertion of a relatively short sequence of frames 502.1, 502.2, 502.3, …, 502.NNN from a video clip 502 (or multiple video clips 502, 503, 504, …, 5NN) in a relatively long sequence of frames 501.1, 501.2, 501.3, …, 501.NNNN of a video 501 resulting in media file 8NN and/or 9NN. In one embodiment, the video 501 is an entire video and the video clip 502 is an advertisement, promotion or other type of message. For example, video 501 could be a movie, a TV show, a mobisode, a news or sports highlight, and so on. In another embodiment, the video 501 is itself a video clip having a relatively short duration. For example, in a typical scenario, the video 501 has a duration of at least 15 sec and the video clip 502 has a duration from 5-10 sec. Depending on the particular context, the video clip 502 may have any duration from about 1 sec up to the duration of the video 501 itself. For example, the video clip 502 could run the entire duration of the video 501, e.g. a split screen or scrolling feed. In another example, the video clip 502 could be as short as 2-3 sec. if the video 501 has a relatively short duration itself, e.g. less than 10 sec. In at least one embodiment, each frame of video clip 502 is inserted as a partial overlay of one or more frames in video 501. For example, video clip 502 may be inserted as a full frame, a partial frame cropped the video having the form of a rectangle (e.g. a banner or box), or a miniaturized frame (e.g. PIP or split screen) and the overlay may have zero transparency, full transparency, or partial transparency. In various embodiments, the video 501 and/or the video clip 502 may be recordings of live action, computer generated animations, simulations, or the like, or a combination of recordings and computer generated one.

In FIGS. 14E, the methods and systems of the invention include insertion of a relatively short sequence of one or more image(s) 401, 402, 403, …, 4NN in a relatively long sequence of frames of a video 501 resulting in media file 8NN and/or 9NN. In one embodiment, the video 501 is an entire video and there is a single image 401 which may be an advertisement, promotion or other type of message in the form of a banner or box including graphic, text or a combination of graphics and text. In another embodiment, there are multiple images 401, 402, 403, …, 4NN which may be an
advertisement, promotion or other type of message in the form of a series of images. In still another embodiment, the video 501 is itself a video clip having a relatively short duration. In at least one embodiment, image 401 (or images 401, 402, 403,...,4NN) is inserted as a partial overlay of one or more frames in video 501. For example, image 401 (or images 401, 402, 403,...,4NN) maybe inserted as a full frame, a partial frame cropped the video having the form of a rectangle (e.g. a banner or box), or a miniaturized frame (e.g. PIP or split screen) and the overlay may have zero transparency, full transparency, or partial transparency. In various embodiments, the image 401 (or images 401, 402, 403,...,4NN) may be photos or recorded images, computer generated images, or a combination of these.

In FIGS. 10 and FIGS. 11A through 11C, the methods and system of the invention describe a media center 2050 for storage of media files obtained from one or more sources (2000a,2000b,2000c,...,2000z) including but not limited to user owned content 2000a, other digital content 2000b, and advertising content 2000c. In one embodiment, the media files comprise user owned content 2000a. In another embodiment, the media files comprise other digital content 2000b such as acquired content, e.g. purchased or licensed content. In still embodiment, the media files comprise advertising content 2000c. In still other embodiments, the media files may comprise media files from any source whatsoever and in any combination. FIG. 10 describes methods of processing media file(s) received from one or more sources or from the media center. For example, processing of media files is shown in subprocesses 2100, 2140, 2180, 2200, 2200A, 2250, 2250A, 2280, 2300, 2400, 2500, 2600, and so on. These subprocesses may be applied to media files from one source or from multiple sources. For example, the subprocess 2100 can be applied to music files owned by the user, to music files acquired online at a music store, to audio soundtracks from an advertiser or marketer, or to any combination of sources. Similarly, subprocesses 2140, 2180 and 2300 can be applied to media files from any source or combination of sources. In addition, processes 2200, 2250, and 2280 can be applied to media files. In one embodiment, media files resulting from processes 2100, 2140, 2180, 2200, 2250, 2280 and/or 2300 are organized in separate area 2050d of the media center from source media files in 2050a, 2050b, and 2050d. In other embodiments, the source media files may be intermixed with source media files in the media center. For example, a resultant media file, e.g. a playlist of multiple songs, is immediately adjacent to the source files. Further, some resulting media files may be entirely from one source, e.g. user content, while other resulting media files may include media files from more than one source.

FIGS. 11A through 11C illustrate the media center having a plurality of media files that may include image files, audio files, video files, and/or any other type of media files. The illustration of the media center shows various examples of both source media files and resulting media files. For example, source media files include but are not limited to image files 401a, 402a, 403a,...,4NNa, 401b, 402b, 403b,...,4NNb, and 401c, 402c, 403c,...,4NNc. For example, source media files include but are not limited to video files 501.1a,...,501.NNNa, 502.1a,...,502.NNNa, 501.1b,...,501.NNNb, 502.1b,...,502.NNNb, ...5NN.1a...5NN.NNNa, 501.1c,...,501.NNNc,
502.1c...502.NNNc, ...5NN.lc..5NN.NNNc. For example, source media files include but are not limited to audio files 601a, 602a, 603a,...,6NNa, 601b, 602b, 603b,..., 6NNb, and 601c, 602c, 603c,...,6NNc. Resulting media files are shown as additional series of media files 700, 800, or 900. For example, resulting media files derived from audio files are denoted by series 700 and include but are not limited to audio files 701...7NN. Resulting media files derived from images and videos are denoted by series 800 include but are not limited to video files 801...8NN. Resulting media files derived from audio and either images or videos are denoted by series 900 include but are not limited to video files 901...9NN.

In operation, one embodiment invention include a servers reading multiple music files 601, 602, 603...6NN, encode these music files into one longer music file 700, use that music file 700 as an audio track in a video file comprised of one or more images 401, 402, 403,...,4NN. The methods include encoding a resulting media file at any frame rate or bit rate. For example, the images could be encoded at a rate of from less than 1/100 frame per second to 60 frames per second or more depending on the desired duration of each image and whether or not the sequence of images comprise an animation or are independent. In the preferred embodiment, if a sequence of images do not comprise an animation, they are encoded at a pre-determined number of frames per second, e.g. 1 frame per second, and the duration of 3 to 5 seconds. The methods of the invention include taking into account what kind of music it is and/or what kind of profile the user has, and other information to place targeted ads these resulting media files.

With reference to FIGS. 15A through 15M, 16A through 16J, 18A through 18E, 19A through 19C, 20A through 20F, 21A through 21D, and 22 through 34, processes and subprocesses are depicted by boxes having either solid or dashed lines. Required steps are depicted by boxes having solid lines. Alternative and/or additional steps are depicted as boxes having dashed or phantom lines.

In FIG. 15A, the methods and systems of the invention includes a process 2100 having the steps of selecting a playlist comprising one or more audio files 2104, reading multiple audio files 2116, combining these multiple audio files into a single audio file 2120. The process may have additional steps of saving the resulting media file as a single media file 2124 and/or making the resulting media file accessible to user 2128. In this way, the user can click a single link to play the resulting media file comprising the playlist rather than separate links to individual files. In one embodiment, the resulting media file is an audio file, e.g. AAC, AMR, MP3, etc. In another embodiment, the resulting media file is a video file, e.g. 3GP, MPEG4, etc. In the preferred embodiment, the resulting media file is a media file having format(s) that are playable by most mobile phones out-of-the-box. For example, the resulting media file may be a 3GP file which has the resulting media file as the audio track.

In FIG 15B, the methods and systems of the invention includes a process 2140 having the steps of selecting a slideshow comprising one or more image files 2144, reading multiple image files 2154, combining these multiple audio files into a single video file 2160. The process may have
additional steps of saving the resulting media file as a single media file 2164 and/or making the resulting media file accessible to user 2168. In one embodiment, the resulting media file is a video file, e.g. 3GP, MPEG4. In other embodiments, the resulting media file is any media format that is capable of recording a slideshow including but not limited 3GP, MPEG, MOV, PPS, and so on.

In FIG 15C, the methods and systems of the invention includes a process 2180 having the steps of selecting a playlist comprising one or more video files 2182, reading multiple video files 2188, combining these multiple video files into a single video file 2160. The process may have additional steps of saving the resulting media file as a single media file 2164 and/or making the resulting media file accessible to user 2168. In this way, the user can click a single link to play the resulting media file comprising the playlist rather than separate links to individual files. In one embodiment, the resulting media file is an video file, e.g. 3GP, MPEG4, etc. which includes one or more sequence(s) of frames of video from one of more images, video clips, etc. In the preferred embodiment, the resulting media file is a video file having format(s) that are playable by most mobile phones out-of-the-box. For example, the resulting media file may be a 3GP file which has the combined audio files as the audio track.

In FIG. 15D, the flowchart describes subprocess 2120 having the steps of reading an audio file 2120.1, reading next audio file 2120.3, and append next audio file to previous audio file 2120.4. The process has the following additional and/or alternative steps of overlapping the next file with previous file 2120.5, leaving a gap between the previous and next files 2120.6, and appending a duplicate file to previous file 2120.7. Alternatively, subprocess 2120 may involve preparing multiple media files to be compatible formats and issuing a command to concatenate multiple audio files in order to have a single resulting media file. The resulting media file may be saved as an audio file or as the audiotrack in a video file.

In FIG. 15E, the flowchart describes subprocess 2160 having the steps of reading an image file 2160.1, reading next image file 2160.3, and encode next image file to previous image file 2160.4. The process has the following additional and/or alternative steps of making a transition, e.g. fade, wipe, etc. between image files 2160.5, leaving a gap between the previous and next files 2160.6, and encoding a duplicate of the previous file 2160.7.

In FIG. 15F, the flowchart describes subprocess 2190 having the steps of reading a video file 2190.1, reading next video file 2190.3, and append next video file to previous video file 2190.4. The process has the following additional and/or alternative steps of overlapping the next file with previous file 2190.5, leaving a gap between the previous and next files 2190.6, and encoding a duplicate of previous file 2190.7. Alternatively, subprocess 2190 may involve preparing multiple media files to be compatible formats and issuing a command to concatenate these multiple files in order to have a single resulting media file.

In FIG. 15G, the flowchart describes subprocess 2300 having the steps of reading a resulting audio file 2310, reading a resulting video file 2320, and encoding audio file as audio track in video file 2330. The process has the following additional and/or alternative steps of reading an individual
2312, reading and individual video file 2322, saving resulting media file 2340, and/or making the file accessible to user 2350. Alternatively, subprocess 2300 may involve preparing multiple media files to be compatible formats and issuing a command to concatenate these multiple files in order to have a single resulting media file.

In FIG. 15H, the flowchart describes process 2200 for editing a video or other media file (e.g. creating a video clip) having the steps of selecting a video 2204 and selecting a duration 2206. In one embodiment, the process has the alternative step of using a default duration 2208. A default duration may be any length of time. For example, the default duration may be any duration, e.g. 5, 10, 15, 30 sec or even longer. In another embodiment, the process has the additional step of saving the media clip 2230. In another embodiment, the process has the additional step of determining if there is another video or media file 2232. In still other embodiments, the process has the additional and/or alternative steps of selecting other parameter(s) 2212 or using a default parameter 2214. For example, other parameters) may be frame size, frame rate, bit rate, video only, soundtrack only, black & white, and so on. The default values may be global defaults for all users or defaults for the individual user, a class of users, or so on. For example, if a default is for an individual user, the default may be selected by user or determined automatically based on various factors such as media type, user preferences, behavior, demographics, etc. For example, if default is for a class of users, the default is typically determined automatically based on users of a particular carrier, a particular device, or type of user account. In operation, the process can be implemented by an ordinary person skilled in the art using one or more utilities such as FFmpeg (available at http://ffmpeg.mplayerhq.hu/index.html).

In FIG. 15I, the flowchart describes process 2200A for editing a video or other media file (e.g. creating a video clip) and sending the edited media file to one or more recipient(s) having the steps of selection a video selecting a video 2204A and selecting a duration 2206A. In one embodiment, the recipient(s) of the edited media file are pre-determined. For example, the recipient(s) may be the user alone, a group of recipients determined the user, e.g. friends, family or other group of recipients pre-determined by the user. In another embodiment, the process has the alternative step of the user selecting one or more recipients 2202A. For example, the recipients may be mobile phone users, the recipients are recipients of email, recipients of IM, and so on. In another embodiment, the process has the alternative step of using a default duration 2208A. For a discussion of default duration, see above. In another embodiment, the process has the additional step of sending the video or media clip 2202A. For example, the media clip may be sent to a mobile phone as part of an MMS message to a mobile phone and/or as an email to an email address to any device or by other forms of electronic message. In another embodiment, the process has the additional step of saving the media clip 2230A. In still other embodiments, the process has the additional and/or alternative steps of selecting other parameter 2212A or using a default parameter 2214A. For example, other parameter(s) may be frame size, frame rate, bit rate, video only, soundtrack only, black & white, and so on.
In FIG. 15J, the flowchart describes a generalized process 2250 for editing a video or other media file (e.g. transcoding a full length editing video, creating a video clip, or so on) having the steps of selecting a video 2254, selecting a start point 2256, and selecting a duration 2262. The start point may be any point in a media file and the duration may be any length of time. In one embodiment, the process has the alternative step of using a default video start point 2258. A default video start point may be any point during the media file. For example, the default start point may be 0 sees, 1 sec, 2 sec, and so on. In another embodiment, the process has the alternative step of using a default duration 2262. A default duration may be any length of time. For example, the default duration may be any duration, e.g. 5, 10, 15, 30 sec or even longer. The default duration may be a global default for all users or a default for the individual user, a class of users, or so on. If a default for an individual user, the default may be selected by user or determined automatically based on various factors such as media type, user preferences, behavior, demographics, etc. In other embodiments, the process may have the additional and/or alternative steps of selecting a bit rate 2266 and/or selecting a frame rate 2272. In other embodiments, the process may have alternative steps of using a default bit rate 2268 and/or using a default frame rate 2274. The default bit rate can be any bit rate including but not limited to 30 Kb per sec, 60 Kb per sec, 128 Kb per sec., and so on and the default frame rate can be any frame rate including 5 fps, 12 fps, 30 fps, and so on. In other embodiments, a video may be played or a 3-D viewer may be run simultaneously to multiple devices using a smoothing code to remove latency from moving objects including an advertisement, message, or other objects in augmented reality as it will smooth the motion of any object. Further, when using a smoothing code, the relevant data to implement the smoothing code is transferred from the server to the mobile device at transfer rate that may vary between 1 and 10 packets per second depending in part on available bandwidth. In still other embodiments, the process has the additional and/or alternative steps of selecting one or more other parameter(s) 2276 or using default parameter(s) 2278. For example, other parameter(s) may be anything including frame size, video only, soundtrack only, black & white, and so on. The default values may be global defaults for all users or defaults for the individual user, a class of users, or so on. For example, if a default is for an individual user, the default may be selected by user or determined automatically based on various factors such as media type, user preferences, behavior, demographics, etc. For example, if default is for a class of users, the default is typically determined automatically based on users of a particular carrier, a particular device, or type of user account. In another embodiment, the process has the additional step of determining if there is another video or media file 2290. In another embodiment, the process has the additional step of saving the edits media file 2294.

In FIG. 15K, the flowchart describes a process 2250A for editing a video or other media file (e.g. transcoding a full length editing video, creating a video clip, or so on) and sending the edited media file to one or more recipients having the steps of selecting a video 2254A, selecting a start point 2256A, and selecting a duration 2262A, and sending the edited file 2292A. In one embodiment, the recipient(s) of the edited media file are pre-determined. For example, the recipient(s) may be the user
alone, a group of recipients determined the user, e.g. friends, family or other group of recipients predetermined by the user. In one embodiment, the process has the alternative step of selecting one or more recipients 2252A. For example, the recipients may be mobile phone users, the recipients are recipients of email, recipients of IM, and so on. The start point may be any point in a media file and the duration may be any length of time. In one embodiment, the process has the alternative step of using a default video start point 2258A. A default video start point may be any point during the media file. For example, the default start point may be 0 sees, 1 sec, 2 sec, and so on. In another embodiment, the process has the alternative step of using a default duration 2262A. A default duration may be any length of time. For example, the default duration may be any duration, e.g. 5, 10, 15, 30 sec or even longer. The default duration may be a global default for all users or a default for the individual user, a class of users, or so on. If a default for an individual user, the default may be selected by user or determined automatically based on various factors such as media type, user preferences, behavior, demographics, etc. In other embodiments, the process may have the additional and/or alternative steps of selecting a bit rate 2266A and/or selecting a frame rate 2272A. In other embodiments, the process may have alternative steps of using a default bit rate 2268A and/or using a default frame rate 2274A. The default bit rate can be any bit rate including but not limited to 30 Kb per sec, 60 Kb per sec, 128 Kb per sec., and so on and the default frame rate can be any frame rate including 5 fps, 12 fps, 30 fps, and so on. In still other embodiments, the process has the additional and/or alternative steps of selecting one or more other parameter(s) 2276 or using default parameter(s) 2278. For example, other parameter(s) may be anything including frame size, video only, soundtrack only, black & white, and so on. The default values may be global defaults for all users or defaults for the individual user, a class of users, or so on. For example, if a default is for an individual user, the default may be selected by user or determined automatically based on various factors such as media type, user preferences, behavior, demographics, etc. For example, if default is for a class of users, the default is typically determined automatically based on users of a particular carrier, a particular device, or type of user account.

In FIG. 15L, the flowchart describes a process 2280 for splicing videos or other media files (e.g. full length videos, video clips or otherwise) having the steps of selecting a first video 2281, selecting a second video 2282, and selecting a bit rate 2290 or selecting a frame rate 2292. The bit rate can be any bit rate including but not limited to 30 Kb per sec, 60 Kb per sec, 128 Kb per sec, and so on and the frame rate can be any frame rate including 5 fps, 12 fps, 30 fps, and so on. In alternative embodiments, the process may have steps of selecting a first video insertion point 2284 and/or selecting a second video start point 2286 and/or selection a duration 2288. The default first video insertion point may be any point in a media file and the duration may be any length of time. In one embodiment, the process has the alternative step of using a default first video insertion point 2285. A default video start point may be any point during the media file. In one embodiment, the process has the alternative step of using a default second video start point 2287. A default second video start point may be any point during the media file. For example, the default start point may be 0
sees, 1 sec, 2 sec, and so on. In another embodiment, the process has the alternative step of using a default duration 2289. A default duration may be any length of time. For example, the default duration may be any duration, e.g. 5, 10, 15, 30 sec or even longer. The default duration may be a global default for all users or a default for the individual user, a class of users, or so on. If a default for an individual user, the default may be selected by user or determined automatically based on various factors such as media type, user preferences, behavior, demographics, etc. In other embodiments, the process may have alternative steps of using a default bit rate 2291 and/or using a default frame rate 2293. The default bit rate can be any bit rate including but not limited to 30 Kb per sec, 60 Kb per sec, 128 Kb per sec, and so on and the default frame rate can be any frame rate including 5 fps, 12 fps, 30 fps, and so on. In still other embodiments, the process has the additional and/or alternative steps of selecting one or more other parameter(s) 2294 or using default parameter(s) 2295. For example, other parameter(s) may be anything including frame size, video only, soundtrack only, black & white, and so on. The default values may be global defaults for all users or defaults for the individual user, a class of users, or so on. For example, if a default is for an individual user, the default may be selected by user or determined automatically based on various factors such as media type, user preferences, behavior, demographics, etc. For example, if default is for a class of users, the default is typically determined automatically based on users of a particular carrier, a particular device, or type of user account. In another embodiment, the process has the additional step of determining if there is another video or media file 2297 and selecting the nth video 2283. In another embodiment, the process has the additional step of saving the resulting media file 2298. In another embodiment, the process has the additional step of sending the resulting media file 2299.

In FIG. 15M, the flowchart describes a process 2280A for inserting media in videos or other media files (e.g. full length videos, video clips or otherwise) and/or sending the resulting media file having the steps of selecting a first video 2284A, selecting a bit rate 2290A and/or selecting a frame rate 2292A, and inserting media 2296A. The bit rate can be any bit rate including but not limited to 30 Kb per sec, 60 Kb per sec, 128 Kb per sec, and so on and the frame rate can be any frame rate including 5 fps, 12 fps, 30 fps, and so on. In other embodiments, the process has the alternative step of selecting an image 2283A or selecting other media file 2285A. The media to be inserted can be media in any form or from any source. For example, the media can be in the form of image(s), audio, or video and can be from the user's own media, clips of media from other sources, and/or advertisements. In other embodiments, the process may have steps of selecting a first media insertion point 2286A and/or selecting a media duration 2288A. The default first video insertion point may be any point in a media file and the duration may be any length of time. In one embodiment, the process has the alternative step of using a default first media insertion point 2287A. A default media start point may be any point during the media file. In one embodiment, the process has the alternative step of using a default second media start point 2287A. A default second media start point may be any point during the media file. For example, the default start point may be 0 sees, 1 sec, 2 sec, and so on. In another embodiment, the process has the alternative step of using a default media duration 2288A.
A default media duration may be any length of time. For example, the default media duration may be any duration, e.g. 5, 10, 15, 30 sec or even longer. The default duration may be a global default for all users or a default for the individual user, a class of users, or so on. If a default for an individual user, the default may be selected by user or determined automatically based on various factors such as media type, user preferences, behavior, demographics, etc. In other embodiments, the process may have alternative steps of using a default bit rate 2291A and/or using a default frame rate 2293A. The default bit rate can be any bit rate including but not limited to 30 Kb per sec, 60 Kb per sec, 128 Kb per sec, and so on and the default frame rate can be any frame rate including 5 fps, 12 fps, 30 fps, and so on. In still other embodiments, the process has the additional and/or alternative steps of selecting one or more other parameter(s) 2294A or using default parameter(s) 2295A. For example, other parameter(s) may be anything including frame size, video only, soundtrack only, black & white, and so on. The default values may be global defaults for all users or defaults for the individual user, a class of users, or so on. For example, if a default is for an individual user, the default may be selected by user or determined automatically based on various factors such as media type, user preferences, behavior, demographics, etc. For example, if default is for a class of users, the default is typically determined automatically based on users of a particular carrier, a particular device, or type of user account. In another embodiment, the process has the additional step of determining if there is another image, video or media file 2297A and selecting the nth media file 2282A. In another embodiment, the process has the additional step of sending the resulting media file 2298A. In another embodiment, the process has the additional step of sending the resulting media file 2299A.

In operation, in FIGS. 15H through 15M show processes for editing media that include one or more web-based editing tools to perform clipping, splicing, and general editing of video and other media files. The media file(s) to be edited may come from varied sources (e.g. user's content uploaded from user's computer, other digital content, or advertising content, and so on) and may be stored in the media center prior to editing. Alternatively, the media file(s) to be edited may be dynamically retrieved from online sources and not from files stored in the media center. In addition, the media file(s) to be edited may be dynamically edited and sent to recipients on the fly. As shown in FIGS. 12A through 12C, 13A through 13C, and 14A through 14C, the edited video or other media file(s) may include inserted audio, image(s), or video insertions in at any point in video as compared to insertion at the beginning (aka "pre-roll") or insertion at the end (aka "post-roll"). As shown in FIGS. 14D and 14E, the edited video and other media files may include partial overlay(s), split screens, subtitles, filters (e.g. black & white), and effects such as "voice over" using other editing tools. In a typical embodiment, an advertisement or other promotion is inserted in a media file. In still other embodiments, the system can also incorporate ads in media dynamically or "on the fly". For example, an advertisement could be inserted in a video or other media file that is selected by a user at the time of viewing or sending to a device. In another example, the advertisement could be inserted in videos or other media files in advance, e.g. by batch application or robot. Further, the selection of relevant advertising can be accomplished with or without information about the specific
user. In particular, the system can select an advertisement based on a user's profile or preferences in order to ensure relevance to that user. For example, the system could select an advertisement based on the user's demographic characteristics, e.g. 18-34 year old, life stage, etc. or based on user's preferences, e.g. comedy, outdoors, travel, etc. Alternatively, the system can select an advertisement based on the selected media itself. For example, the system can select an advertisement using the category, title, and/or description of the media selected. In one embodiment, a database would include one or more possible keywords associated with each advertisement. By querying the database using keywords from the title and/or description of a media file, a relevant advertisement can be retrieved. In another embodiment, a database would include one or more categories, e.g. SCI-FI, sports, etc. associated with an advertisement. By querying the database using a category of the media file, a relevant advertisement can be retrieved.

In FIG. 16A, the methods and systems of the invention includes a combination of processes for obtaining media files (by uploading, browsing and/or acquiring media), defining new playlist(s), organizing media files (by grouping and/or arranging media items in playlists), scheduling transmission of media file(s), and/or transmitting playlists to mobile devices. One embodiment of the invention includes subprocesses 2400, 2800, 3100 and 3400. For example, a user uploads one or more media files from that user's personal media collection to that user's online repository or media center, adds the media file(s) to a playlist, and schedules transmission of the playlist to that user's mobile phone, and playlist is sent to that user's mobile phone using selected schedule. Another embodiment includes subprocesses 2600, 2800, 3100 and 3300. For example, a user purchases one or more media file(s), saves the media file(s) to that user's repository or media center, user organizes media file(s) in a predefined or default playlist, e.g. "NewEditions" or "New Releases", a predefined or default schedule is applied, and playlist is sent to that user's mobile phone using the default schedule. In still another embodiment the invention includes subprocesses 2500, 2800, 3200 and 3500. For example, a user browses one or more media file(s), organizes the file(s) in one or more playlist(s), a default schedule is applied, and the playlist(s) are sent using the default schedule. In still another embodiment, an additional step may include a user defining one or more new playlist(s). In still another embodiment, one or more of featured or promoted media file(s) are added to one or more playlist(s). In yet still another embodiment, one or more advertisements are added to one or more playlist(s).

In FIG. 16B, a process comprises uploading one or more media file(s) from a user's computer 110 or mobile device 100 to an online repository or media center stored on a server 200. The process includes the steps 2430, 2440, and 2470. The process may also include but is not limited to alternative and/or additional steps 2410, 2420, 2450, 2460, 2480, 2490, 2495, and/or 2497. In one embodiment, the user's computer 110 is a desktop computer containing one or more digital media files that are playable using software such as RealPlayer made by Real Networks, Inc. or Windows Media Player made by Microsoft Corporation. In another embodiment, mobile device 100 is a
notebook computer or a handheld computer containing one or more digital media files. In still
another embodiment, mobile device 100 is a mobile phone containing digital media files.

In various embodiments of the invention, in addition to uploads of media files by a mobile
phone user, media files may be uploaded by advertisers, media companies, content developers, and
other parties. The files may transferred by any means including web forms, FTP, email, etc. When
transferred, the media files are typically processed and resaved in formats compatible with mobile
devices. Such processing may include transcoding of media files. In addition, media files may be
processed by sampling of extracting, e.g. video clips or individual images, and saved as separate
media files. Further, the media files also be stored in their native file formats for any subsequent
uses, e.g. resampling, tracking, etc. Although the media files may be stored in a location which is
web accessible, the media files may also be stored in a location accessible via the internet or other
network but not necessarily web accessible. For example, the media files may be stored in a
database and dynamically retrieved and posted in mobile webpages.

In FIG. 16C, the process comprises browsing one or more media file(s) and/or saving media
file(s) in an online or offline repository stored on a computer 110, a mobile device 100, or a server
200. The process includes the steps of presenting descriptors representing one or more media file(s)
2530, user selecting media file(s) 2550, and grabbing a selected media 2580. In one embodiment,
descriptor(s) is(are) text. In another embodiment, descriptor(s) is(are) image(s) or graphical
object(s). In still another embodiment, descriptor(s) have links to other files and/or information. The
process may also include alternative and/or additional steps 2510, 2520, 2525, 2540, 2560, 2570,
2590 and/or 2596. In various embodiments, the process includes the step of a user selecting media
2525 (e.g. a user selecting individual media files media, a user selecting a category of media files, or
media search). Text or graphical objects or other identifier(s) representing each media item are
presented 2530 or 2630 to the user. In one embodiment, the identifiers of each item in the search
results may be images and titles of video clips for the user to select a media file (image, video, or
song) to save or send a clip. For example, the image may be a thumbnail of an image; or a still taken
from a single frame of a video; a still comprising multiple (2, 4, 6, 8 ...) frames from a video such as a
frame @ 1 sec, 5 sec, 10 sec, and 15 sec; or a still comprising multiple frames at the beginning, one
quarter point, midpoint, and three quarters point; or an image derived from the video such as
superimposed; or an image from another source such as an iconographic or an advertisement.

In FIG. 16D, the process comprises purchasing one or more media file(s) and/or saving media
file(s) in an online or offline repository stored on a computer 110, a mobile device 100, or a server
200. The process includes the steps of presenting descriptors representing one or more media file(s)
2630, user selecting media file(s) 2650, and grabbing a selected media 2680. In one embodiment,
descriptor(s) is(are) text. In another embodiment, descriptor(s) is(are) image(s) or graphical
object(s). In still another embodiment, descriptor(s) have links to other files and/or information. The
process may also include alternative and/or additional steps 2610, 2620, 2625, 2640, 2660, 2670,
2675, 2690 and/or 2696. In various embodiments, the process includes the step of a user selecting
media 2625 (e.g. a user selecting individual media files, a user selecting a category of media files, or media search).

In FIG. 16E, a process comprises defining a new playlist. The process includes the steps of 2734 and 2760. The process may also include alternative and/or additional steps 2710, 2720, 2730, 2736, 2738, 2750 and/or 2770. In one embodiment, a name of a new playlist is typed by the user. In another embodiment, the name of a new playlist is selected from predefined list of suggested names, e.g. "partymix". In still another embodiment, a default name is applied to the new playlist, e.g. "playlistOl".

In FIG. 16F, a process comprises organizing one or more media file(s) into a playlist. The process includes the steps 2840, 2860, 2870, and 2884. The process may also include alternative and/or additional steps 2810, 2820, 2824, 2828, 2830, 2850, 2880 and/or 2888.

In FIG. 16G, a process comprises defining a schedule for transmission of one or more playlist(s). The process includes the steps 3014, 3030, 3034, and 3054. The process may also include alternative and/or additional steps 3010, 3018, 3022, 3026, 3038, 3042 and/or 3050.

In FIG. 16H, a process comprises selecting a predefined schedule for transmission of a playlist. The process includes the steps 3114, 3134 and 3154. The process may also include alternative and/or additional steps 3110, 3118, 3122, 3138 and/or 3150.

In FIG. 16I, a process comprises transmitting a playlist to one or more mobile devices across one or more wireless network(s) initiated by a user. The process includes the steps 3310, 3314, 3318, and 3350. The process may also include alternative and/or additional steps 3322, 3326, 3330, and/or 3334.

In FIG. 16J, a process comprises transmitting a playlist to one or more mobile devices across one or more wireless network(s) according to a predetermined schedule. The process includes the steps 3410, 3414, 3418, and 3450. The process may also include alternative and/or additional steps 3422, 3426, 3430, and/or 3434.

[0148] In FIG. 16K, the subprocess 2525 or 2625 comprises the step of presenting a user with one or more opportunities to find media 2N25.1 (e.g. to enter URL, to select a category or classification, to enter search parameters or keywords, and so on.) and a step of obtaining an index which may comprise a step of creating an index of media files 2N25.5; a step of getting an index of media file(s) to specific category or classification 2N25.9; or a series of steps of executing a search 2N25.12, retrieving a remote index file or webpage 2N25.13, parsing the index file or webpage code, and/or retrieving the URL for each media file 2N25.15. In at least one embodiment, the broad steps are 1) Enter search keyword(s), 2) Go get that search page, 3) Parse the results from the search page and display them, 4) Get the link URL to the video or image that is selected by the user, 5) Go get that video or image and download it and convert it and then save it or send it or both. In other embodiments, the subprocess may have additional steps of 2N25.4, 2N25.6 and 2N25.7; or the steps of 2N25.8 and 2N25.10; or the steps of 2N25.11, 2N25.16, and 2N25.17.
Referring to FIGS. 16A through 16L and FIG. 20D, the system of the invention can accomplish media search using intelligent processing whereby the system can use existing search and display engines to mobilize content libraries. No modifications are necessary on the part of the content provider. In several embodiments, the process starts selection of a Remote Index file or webpage (or multiple remote index files or webpage) that contains Remote File Locations: file:// or http://. This remote index file or webpage can be any kind of page such as those of YouTube.com, Google Images, etc. or any other page that has content indexed or catalogued. The remote Index is read by the system and search results are displayed on an integrated display page (which may branded, co-branded, or otherwise). Once the file is selected, the system takes the file location, grabs the file, processes it and sends it out via the system. The file does not ever have to be saved locally to our server, just read into memory processed and flushed from memory. The content can be saved into a users personal library, for later enjoyment, if the content provider chooses to make that option available to the user. But the content provider is not compelled to store its content anywhere but on its own server.

In operation, the relationship between the system and the content provider is not messy, the content provider holds the content, the system provides the technology. A web interface is where they meet. In addition, user stats can be derived very easily from this interface, e.g. how many files were accessed, what times, what users received the files, etc. Using the system of the invention, we have already tested fully functioning examples using Google Images and YouTube.com among others. For example, the mobilization of Google Images shows how we can take an existing, dynamic index, in this case search results, and use that as the point of contact for allowing access to the entire library of images indexed by Google. None of the image files are ever saved to our server. They are only read into RAM to be processed and sent out and then flushed from our system. These images can also be made available for viewing on a mobile device, not just sending out via MMS. For example, the mobilization of YouTube shows how sites can allow users to load pieces of content into their user accounts from a content provider, in this case YouTube.com. Using the same method of processing a dynamic index page, this time the users are able to save the content into their accounts for later use. This would be more like the way iTunes operates. You pay for a piece of content, and you get to save it and keep it and use it in your personal library. These videos are available for viewing on a mobile device using the system and also for sending out via mms through the system. All of this was accomplished without either one of these sites changing a single line of code. Our system, using intelligent processing, is doing all of the work using the systems that already exist on these sites.

One system of the invention is user driven mobilization system. In a typical embodiment, the user driven mobilization system uses media search to determine which media files to mobilize. In one embodiment, only those media file(s) that a user selects from search results is(are) mobilized. Our system puts a searchable interface onto every video in a site’s library immediately. The videos are saved into a database once they have been converted. When someone requests a video, it is checked against the mobile database. If it has been converted already, the converted version is served. If it
hasn't been converted already, it is converted and stored, and served. An entire site's library of content is immediately available, searchable. If a piece of content isn't popular, or old, it never gets requested, it is never converted, and space and processing power aren't wasted. The only delay is when the first person requests the video, then it is done. The system can take the videos that are most popular from the site's website and be converting the popular ones all the time. This way the videos that people want to see are converted first, the ones that aren't so popular are converted on the fly when they are requested and saved for future requests. The site's mobile library is built on the fly by users and what the users watch. The videos are saved into a database once they have been converted. When someone requests a video, it is checked against the mobile database. If it has been converted already, the converted version is served. If it hasn't been converted already, it is converted and stored, and served. An entire site's library of content is immediately available, searchable. If a piece of content isn't popular, or old, it never gets requested, it is never converted, and space and processing power aren't wasted. Thus, a user driven mobilization system is more efficient. The only delay is when the first person requests the video, then it is done. The system can take the videos that are most popular from the site's website and be converting the popular ones all the time. This way the videos that people want to see are converted first, the ones that aren't so popular are converted on the fly when they are requested and saved for future requests. In still other embodiments, a link to a media file is saved in the database rather than that media file itself and a clip of the media file is converted on the fly when the user requests the media be mobilized and sent to a mobile device.

In addition to content mobilization, a system of the invention includes the insertion of advertisements in the media. The insertion of advertisements may be accomplished after mobilization of content or may be done on the fly as content is mobilized. The insertion of advertisements may be accomplished using any of the processes described herein including the processes to edit media or combinations thereof (e.g. combining media, splicing media, insertion of images in media, insertion of audio in media, insertion of partial overlays, clipping and insertion of clips in media, and so on). Further, the insertion of advertisements may be accomplished using a batch process, a robot application, or other process and the resulting files stored as 'ad-loaded' files. As users with ad-supported accounts request to view files or send a media file, the ad-loaded file may be retrieved. In one embodiment, the advertisement may be selected based on currency, e.g. a sale or special event. When the inserted advertisement is not longer applicable, the advertisement may be automatically removed and/or replaced with a different advertisement using the batch process, the robot application, or other process, and the resulting files re-saved. Alternatively, the advertisement may automatically be removed and/or replaced after a specified number of impressions, page views, or the like. In another embodiment, advertisements may be selected based on the relevancy to the specific user. For example, batch process or robot may insert highly relevant advertisements in the content uploaded by user. In still another embodiment, advertisements are selected based on a subset or category of users based on demographics, preferences, or behavior. For example, a batch process or
robot may insert advertisements that are generally relevant to that subset of users. In still other embodiments, different advertisements may be inserted in media files and saved as different resulting files. For example, one advertisement may be tailor to women and another advertisement may be tailored to men.

In FIG. 16L, the subprocess 2580 or 2680 to grab a media file comprises the step using command to request media 2N80.1 and the step of receiving media 2N80.2. In at least one embodiment, the command used to grab the media file is accomplished using a PHP extension called CURL with the relevant URL address and relevant parameters. The subprocess may have additional steps 2N80.3, 2N80.4, 2N80.5, 2N80.6, and/or 2N80.7. In at least one embodiment, the subprocess retrieves an index in the form of search results from a remote server. For example, with image search, here is the page that I parse when we search for Apple:

http://images.google.com/images?hl=en&q=apple&um=l &sa=N&tab=wi

First, I save the source code of the page to our disk. Then, then the systems goes through it line by line and look for the pattern match of "imgurl=" and break the lines up on certain letters and words and get the link to the actual image (or a thumbnail of the image) in a variable. Then, the system can display it as a preview and send the URL of the image to the message page to enable the system to go get and download and send in a message and save to the user's account.

In FIG. 20D, a process transmitting a playlist to one or more mobile devices across one or more wireless network(s) from a web accessible location. The process comprises the step 3612 of browser sending a request for a URL, step 3616 of a webserver receives request from browser, step 3664 a server sends a MIME code for media file comprising video, e.g. video/3GP, and the media file encoded using a codec corresponding to the device, e.g. H.263, H.264, MP4, etc., and step 3680 device plays the media file. In various embodiments, the process includes the additional preliminary steps 3620, 3624, and/or 3630 of determining the browser, determining the carrier, and/or determining the device.

In the typical embodiment, steps 3620, 3624, and 3630 are subprocesses. For example, in subprocess 3620 the browser is determined from the request of a URL which typically identifies the browser, e.g. Openwave, Obigo, etc. Similarly, in subprocess 3624, the carrier can be determined by the request for a URL which includes an IP address that corresponds to a carrier's WAP gateway.

For example, in PHP, the following command and input variable returns the requester's IP address:

$_SERVER['REMOTE_ADDR'] ;

The following command and input variable returns the reverse DNS of that IP address to determine the domain name or gateway:

$_SERVER['REMOTE_HOST'];

Using a series of pattern searches for different text strings corresponding to the WAP gateways of each carrier, the carrier is determined. For example, the following IF THEN command is used to determine if the gateway is Verizon.

If VZW is in string $_SERVER['REMOTE_HOST'] then carrier = Verizon
Further, regarding subprocess 3630, the device can be determined from the requester of a URL. For example, in a typical embodiment, the device can be determined from the "user agent string". For example, in PHP, the following command and input variable returns the User agent of the browser

```
$_SERVER['HTTP_USER_AGENT'];
```

A search for the user agent string in an XML file with thousands of device profiles for the different user agents is done to determine whether or not the capabilities are known for that device. If yes, then the capabilities are known, and thus, the media files having the applicable codecs is determined. If no, then the capabilities are not known directly but can be ascertained by looking up the browser type in a list of various browsers and the different capabilities that those browsers are installed on. The lowest common capability associated with devices running that type of browser may be used, and thus, the media file having applicable codecs is determined. In other embodiments, the searches may be one or more queries to datatable(s) in a database(s).

In at least one embodiment, the process includes the alternative step 3668 of a server sends a MIME code for the media file, e.g. audio/3GP, and the media file encoded using a codec corresponding to the device, e.g. AMR. In at least one embodiment, the process includes the alternative step 3670 of a server sends a MIME code for the media file and the media file encoded using a codec corresponding to the device.

In other embodiments, the process includes the additional intermediary step 3676 of launching a media player or application that is separate from the browser. In still other embodiments, the process includes the additional intermediate steps 3636, 3640, 3650, 3654, 3660, 3658, and/or 3660. Having immediate steps can have advantages. First, webpages can be generated and served as requested using PHP or other commands, and hence the process, may be database driven. Second, webpages will served accurately even if a user logs using another person's device which is a different device and/or a different carrier's network. Third, the user interface may be customized by the user or administrator in real time.

In various embodiments, FIG. 20D describes a subprocess 3664 for sending a media file as having at least the step of 3664 of selecting file with the codec corresponding to the hardware and including the applicable MIME type corresponding to the wrapper (and the carrier). For example, a wrapper for pushing video messages to most mobile phones is generally a .3GP wrapper. For certain mobile devices and phone, the wrapper may include other file formats including a MPEG4 file. In the preferred embodiment, the video and audio components are coded in a common format or codex accepted for delivery to mobile phones by all carriers such as H.264 for video component and AMR for the audio component. An example of the code that grabs files from the database and serves them to the browser is shown below for selected carriers in Table 5 below.

```
// database connection
```

Table 5. Example of code
$conn = mysql_connect("localhost", "user", "data")
  OR DIE (mysql_error());
@mysql_select_db ("database", $conn) OR DIE (mysql_error());
$sql = "SELECT * FROM image WHERE image_id="$_GET["iid"];
$result = mysql_query ($sql, $conn);
if (mysql_num_rows ($result)>0) {
  $row = @mysql_fetch_array ($result);
  $data_type = $row["data_type"];
  $image = $row["image"];
  Header ("Content-type: $data_type");
  print $image;
}
?>

In many embodiments, the key code is the last two lines in the above example. The next to last line sends over the correct datatype, e.g. MIME type, and the last line sends the data for the media file. In the preferred embodiment, the routine is a PHP function which calls a database based on certain parameters including the user's carrier and the user's device type, e.g. Motorola RAZR with Obigo browser. In other embodiments, the routine may be a series of IF...THEN...ELSE statements with one such statement for each carrier and/or device type. In still other embodiments, the files may be delivered as video on demand using WAP or as streaming media using protocols such as RTSP or Windows MMS.

With reference to FIGS.6A and 6B, the drawings illustrate front views of a mobile phone's display and user interface. In FIG. 6A, the display area 30 shows at least one image 90. In many embodiments, the display area shows a multimedia message received via MMS or WAP push with a link, e.g. "Click here", "Click to play media", or "http://...". When the user clicks the link in the message, another webpage is opened with at least a link to the encoded media file that may be downloaded or streamed depending on the mobile device and carrier. The webpage may also include other content such as an image 96 and text in addition to the link to the encoded media file. In FIG. 6B, the display area 30 shows a plurality of displayed objects including at least one image 90. In many embodiments, the displayed objects comprise images and text. In many embodiments, the images may be advertisements with links to more information. For example, the image 90 at the top can be banner ad and the image 90' to the right can be a display ad. In another embodiment, an image 90' appears directly below the banner. In another embodiment, the image 90 or 90' recurs at intervals on the page, e.g. a repetition of the same ad, or a series of different ads. Also, in various other embodiments, each of the images 90, 90' or 90" can be linked to other information at a URL or a filename. Some embodiments have a scrolling information or an RSS feed 90' at the top in addition
to or in lieu of the banner ad. When the user clicks the link at the first webpage, a 2nd webpage is
opened with a link to the encoded media file that may be downloaded or streamed depending on the
mobile device and carrier. The webpage may also include other content such as an image 96 and
text in addition to the link to the encoded media file.

In some embodiments, a user interface can be fully web based (e.g. HTTP on desktops and notebooks
and WAP or other on mobile phones).

With reference to FIGS. 7A, 7B, 8A through 8C, and 9A through 9D, a mobile electronic
device is depicted by numeral 100 and any other electronic device is depicted by numeral 110. The
mobile device 100 may include any electronic device including a mobile phone, a PDA, a hybrid PDA
and phone, a mobile computer such as a laptop, notebook, tablet, and so on, as the term "device" is
defined herein. The other electronic device 110 may be a desktop, workstation, mainframe, server,
control unit for a building automation system, control unit for a telecommunication system, or other
immobile electronic device.

With reference to FIGS. 7A, 7B, and 8A through 8C, the perimeter of the device is shown by
dotted lines, electric power (or bus) lines are shown by dashed lines, and alternative components and
devices are shown by phantom (or dot-dash) lines.

FIGS. 7A and 7B are schematic drawings of alternative circuits of a mobile device 100
having a central processor 10 in communication with at least one storage medium 20a. In one
embodiment of the invention, the circuit comprises the central processor 10, the storage medium 20a,
at least one display 30, and at least one on-board power source 58. For example, the display can be
any type of display including a flat panel display such as LED, LCD, TFT, plasma, and so on, or a
combination of these including a backlit display. For example, the on-board power source may be a
battery, a fuel cell, a photovoltaic cell, and so on. In another embodiment, the central processor is in
communication with a receiver 15a and at least one speaker 32, and in another embodiment, the
central processor is in communication with a transmitter 15b. In still another embodiment, the circuit
comprises a sound processor 52 in communication with the central processor and the speaker 32. In
one embodiment, the central processor 10 is in communication with a wireless cellular network of the
type operated by Verizon, Sprint or AT&T through the receiver 15a and the transmitter 15b. In still
another embodiment, the central processor is in communication with the receiver/transmitter 15 which
comprises a receiver 15a and/or transmitter 15b. In still another embodiment, the device comprises at
least one input device 40. In yet still another embodiment, the circuit also comprises a video
processor 50 in communication with the central processor and the display. In a further embodiment,
the circuit also comprises one or more additional storage mediums in communication with the central
processor where the additional storage mediums may be internal storage mediums 20b, 20c, and 20d
and/or external storage mediums 21a, 21b, 21c...21zz. The second storage medium may be flash
memory or any type of external device capable of storing data including but not limited to a memory
stick, CF card, a SD card, a jump drive, and so on. In still another embodiment, the circuit also
comprises an output device 70 in communication with the central processor. In still another embodiment, the central processor is in communication with a server 200 at a remote location whereby information is transmitted to and from the remote location. In yet still other embodiments, the device 100 has additional displays 31a, 31b, and 31c and/or additional speakers 33a and 33b. In still yet another embodiment, in addition to the onboard power source 58, the device 100 has a connection to an external power source 62, and as necessary, a transformer 60. The transformer may be a AC-to-DC converter, a step down transformer, or any type of transformer or adapter.

With reference to FIG. 7B, the circuit includes an input-output processor 74 which is in communication with the central processor 10. In another embodiment, the input-output processor 74 is in communication with a modem 80 and/or a wireless network adapter 82 which in turn is connected to a network 72. In still another embodiment, the modem 80 or network adapter 82 is an external component rather than an internal component. In still another embodiment, the device 100 includes additional input devices 40a... 40z such as alternative keys, touchpads, or touchscreens for data entry, a microphone, and/or digital camera. In yet still another embodiment, the device 100 includes auxiliary processor(s) 56a, 56b, and 56c in communication with the central processor 10.

FIGS. 8A through 8C are schematic drawings of alternative circuits of other electronic devices 110 including stationary electronic devices having a central processor 10 in communication with at least one storage medium 20a, and at least one input device 40, and at least one connection to an external power source 62. In one embodiment of the invention, the circuit comprises the central processor 10, the storage medium 20a, at least one display 30, and the input device 40. In another embodiment, the central processor is in communication with a network 72. In still another embodiment, the circuit includes at least one speaker 33a. In yet still another embodiment, the circuit also comprises multiple output devices 70, and/or network connections 72. In yet still another embodiment, a modem 80 and/or a wireless network adapter 82 is in communication with the central processor. In yet still other embodiments, the circuit also comprises multiple internal storage mediums 20a...20c, external storage mediums 21a...21zz, displays 31a...31c, speakers 33a...33c, input devices 40.

In FIGS. 8A through 8C, the central processor may be in communication with a network 72 and the device 110 has at least one input-output device 74. When in communication with the network 72, the input-output device 74 may be a network card of the type manufactured by Novell Communications of Provo UT; a dial-up modem of the type manufactured by Hayes Corporation of Boston MA; or an alternative type of modem such as wireless, DSL, or cable modems. In the preferred embodiment, the I/O device 74 is a wireless modem because it has the capability to remain "always-on" similar to a mobile communications device.

With reference to FIG. 8B, the audio processor and video processor are a single audio-visual processor 54 which is in communication with the central processor 10 and/or one or more displays 31a... 31c and/or one or more speakers 33a... 33c. In another embodiment, the modem 80 and/or a wireless network adapter 82 is an internal component rather than an external component.
With reference to FIG. 8C, the circuit includes an input-output processor 74 which is in communication with the central processor 10. In another embodiment, the input-output processor is in communication with a modem 80 and/or a wireless network adapter 82 which in turn is connected to a network 72. In still another embodiment, the device 100 includes auxiliary processor(s) 56a, 56b, and 56c in communication with the central processor 10. In yet others embodiments, the circuit may include a series of displays 31a...31zz, a series speakers 33a...33zz, multiple input devices 40, and/or multiple output devices 70.

FIGS. 9A through 9D are perspective drawings of alternative mobile devices 100 having a display 30, a speaker 32, at least one input device 40, and at least one message display area 500. In one embodiment, the display 30 may be a flat panel display and the input device(s) 40 is may be one of several types including a number/letter keypad or navigation/execution keypad of the type manufactured by Samsung Electronics, or a touchpad of the type manufactured by Toshiba, or a touchscreen of the type made by Sony Electronics. In FIGS. 9A and 93B, the message display area 500 is shown at or near the top of the display 30 but may be located elsewhere on the display 30 or may be enlarged to encompass the entire display 30 or shrunk to a smaller size. Similarly, in FIGS. 9C and 9D, the message display area 500 is shown at or near the center of the display 30 but may be located elsewhere on the display 30 or may be enlarged to encompass the entire display 30 or shrunk to a smaller size.

In FIG. 9A, the device 100 has three input devices 40a, 40b and 40c corresponding to a number/letter keypad, a navigation/execution keypad, and a microphone, respectively. In FIG. 9B, the device has four input devices 40a, 40b, 40c and 40d corresponding to a navigation/execution keypad, a touchscreen, a number/character keypad, and a microphone, respectively. In FIG. 13C, the device has three input devices 40a, 40b, and 40c corresponding to a character keypad, a touchpad, and a number keypad, respectively. In FIG. 13D, the device has four input devices 40a, 40b, 40c and 40d corresponding to a first navigation/execution keypad at the left, a second navigation/execution keypad at the right, a touchscreen, and a microphone, respectively.

FIG. 9E is a perspective drawing of a stationary electronic device having a display 30, a speaker 32, at least one input device 40, and at least one message display area 500. In FIG. 9E, the message display area 500 is shown at or near the top of the display 30 but may be located elsewhere on the display 30 or may be enlarged to encompass the entire display 30 or shrunk to a smaller size. In FIG. 9D, the device has one input device 40 corresponding a keyboard.

The circuit and is powered by either an internal power source 15 or by an external source 62 of direct current (DC) power or alternating current (AC) power. Where the source is internal, the power source 15 may be including but not limited to a battery, a fuel cell, photovoltaic cell, and so on. Where the source is AC power, a transformer 60 is in communication with the source 62. The transformer may be a board-mounted transformer of the magnetic type manufactured by Hammond Manufacturing of Cheektowaga, NY or a stand-alone power adapter of the type manufactured by Motorola Corporation of Schaumburg, IL.
In one embodiment the storage medium(s) 20a...20d may be a hard drive of the type manufactured by Quantum Corp. of Milpitas, CA, and in another embodiment, the storage medium may be a flash memory device of the type manufactured by Sandisk. Alternatively, the central processor receives instructions and/or data from the storage medium 20 and/or a second storage medium 22. The second storage medium 22 may be a DVD, CDROM, memory stick, CF card, SD card, jump drive, programmable read only memory (PROM), electronically-alterable programmable memory (EPROM), or the like. In another embodiment, the second storage medium 22 is an integrated circuit housed within a game box. In still another embodiment, the second storage medium is a CDROM which is removeably connected to the circuit.

With reference to FIGS. 8A through 8C, a remote server is in communication with the mobile device using networks 72. The remote server may include any computer including a file server, a web server, and so on. The communication may be accomplished by any network or combination or networks (including wired or wireless protocols).

In FIG. 20A, subprocess 1015, 2015, ...N015 entitled "Determine geographic variables" details steps N015a through N015i of determining geographic variables including but not limited to location as well as other variables such as direction that may be determined from motion sensors on the mobile device (gyro and compass). In one embodiment, geographic variables comprise GPS coordinates or a portion thereof such as the latitude, longitude, and/or elevation. In another embodiment, geographic variables comprise a telephone number or portion thereof such as the area code (or city code) and the exchange. In still another embodiment, geographic variables comprise an IP address or mobile IP address. For example, the IP address may be based on the physical address of the IP address owner identified at a RIR, records of an ISP or other point of access, a cookie, robot, or other software, or another method or method(s). In still another embodiment, the geographic variables include the compass direction of the mobile device such as done with iPhone. In FIG. 20B, the optional subprocess 1096, 2096 details steps of requesting information from the user and prompts for user action. In FIG. 20C, the optional subprocess 1040, 2040, N040 details steps of validating a message, media or other information to be determine if the message, media or other information should be sent or made accessible to the user. In FIG. 20D, the subprocess N034, 3600 details the steps of user requesting and receiving an encoded media file that can be played on the phone or mobile device.

In FIG. 20E, subprocess 3030, N030 entitled "Determine if current location is a destination" details steps N030a through N030d of determining if current location of a mobile device 100 is a destination. In one embodiment, the subprocess calls algorithm A01 to determine destinations by measured travel velocity T-Vel. Since a device may become relatively immobile, e.g. near zero velocity, at locations other than a destination, e.g. stopped traffic, Algorithm A01 is efficient but tends to be over-inclusive. In another embodiment, the subprocess calls algorithm A02 to determine destinations by measured persistence. Such measured persistence is more accurate than using measured velocity but is less efficient. In still another embodiment, the subprocess first calls...
algorithm A01, and if a destination is a "candidate" destination, then calls algorithm A02. In this hybrid process, algorithm A01 is used to screen potential destinations as "candidate" destinations and algorithm A02 is used to verify "candidate" destinations as "visited" destinations. Such hybrid process is efficient and not over-inclusive. In FIG. 20F, the subprocess 3035/N035 details the steps to make a record of the destination.

In FIGS. 21A through 21D, subprocesses detail the steps required to determine featured destinations (aka Promospots), personal destinations (aka Myspots), group destinations (aka Ourspots), and popular destinations (aka Hotspots).

FIGS. 22 through 34 show examples of alternative flowcharts of algorithms (A1, A2, A3…An) for future location prediction. In addition to the examples shown in these figures, any future location prediction algorithm may be used to predict the future location of the user of a mobile device. For example, algorithms A03 through A09 may be used, individually or in combination, or one or more of hybrid algorithms A10 through A13 may be used, or one or more other future location algorithms may be used.

In some embodiments, the algorithms may comprise a contemporaneous or "real-time" process. In other embodiments, one or more algorithms may comprise a contemporaneous or "real-time" process while other algorithms are a batch process. Also, the algorithm(s) may be executed by processors on-board the electronic device, e.g. 10, 56, and so on, or by processors in the server 200. Further, all of the algorithms would not be utilized unless redundancy is desired. Thus, to maximize efficiency and/or minimize redundancy, the particular algorithms used may vary by the embodiment. As a further example, in one embodiment, algorithm A03 may be used in conjunction with algorithms A04 and A08, or in conjunction with algorithms A07 and A08, or in conjunction with hybrid algorithm A10, A11, A12 or A13.

In various embodiments, using the data collected from a mobile device, algorithm(s) may be used to predict the user's mode of transportation and the future location of the user to go to one or more potential destinations. The algorithm(s) may take into account one or more spatial or kinetic variables- measured and/or derived- including but not limited to geographic variables and temporal variables such as horizontal velocity, vertical velocity, latitude, longitude, altitude, heading, orientation, travel distance, travel time, range and/or past points of reference to predict the most likely destinations among potential destinations or predicts the path of travel. For example, in one embodiment, an algorithm may predict likely destinations in close proximity to the highway, or if not on a highway, in close proximity to the heading. In another embodiment, the algorithm may predict likely destinations in close proximity to the highway or the heading that are within a predetermined range, e.g. 1, 5 or 10 km. In still another embodiment, the algorithm(s) predict the likely destinations based on travel velocity of user, e.g. within a dynamic range, or based on mode of transportation. In at least one embodiment, algorithm(s) assigned a probability factor, weight, or rating to each potential destination, where a potential destination of closer proximity to the user or the heading, as applicable has a higher probability factor than a potential destination of farther proximity to the user or the
heading, as applicable. In other embodiments, potential destinations are filtered by the direction or heading of the mobile device. For example, if a user of a mobile device is traveling due east, the user is more likely to want to go destinations that are in that general direction or heading (+/− 20 deg of heading). In still another embodiment, potential destinations are filtered by velocity of the mobile device. Foreexample, if a user is traveling at 80kph heading due east, the user is more likely want to go to potential destinations that are on the highway and at least 5-15 minutes down the road or highway, and thus, velocity can predict his future location on highway and be used to filter potential destinations. Also, the user would not likely be interested in potential destinations that are at the current location or behind his or her current position since user is traveling due east. The algorithm(s) result in prediction of more accurate potential destination(s) than any other previous methods.

In another embodiment, the database(s) are populated automatically by data that is collected from mobile devices, stored on one or more server(s), and processed by one or more algorithms. In still another embodiment, the results from the algorithms are also be stored in a database and referenced against known datapoints, landmarks, points of interest, etc. Using a unique identifier for each user, any visited destinations are new data points and are converted to real life or 'actual' places. A reference database of actual 'places' is the Geographical Names Information System (GNIS) maintained by the U.S. Geodetic Survey. In other words, any destination the person goes including an address, a geographical location such as a forest, lake, park-basically, any place that person goes-will be checked against known location points and converted to predicted points of interest. These points of interest will all hold a probability influence factor in the algorithm. In one embodiment, a database stores the personal destinations of each user—whether locations or 'actual' places—that can be used to predict future destinations for that user in various processes, e.g. 1000, 2000, and so on. Such personal destinations can be presented to user via the user's mobile device 100 or other electronic device 110. In another embodiment, a databases stores the common destinations of a group of users—whether locations or 'actual' places—that can be used to predict future destinations for the group of users in various processes, e.g. 1000, 2000, and so on. Such group destinations can be presented to user(s) via the users' mobile device 100 or other electronic device 110. In still another embodiment, a databases stores the frequently visited or popular destinations of a multitude of users—whether locations or 'actual' places—that can be used to predict future destinations for multiple users in various processes, e.g. 1000, 2000, and so on. Such popular destinations can be presented to user(s) via the users' mobile devices 100 or other electronic device 110.

Knowing personal destinations, group destinations and/or popular destinations of users will also allow weighting of these destinations more than others. In addition, knowing such histories of destinations will extrapolation of information about user habits, preferences, and behaviors that can be used to identify future destinations more likely to be visited than others based on that past data as well as to identify opportunities for targeting of messages to users. Further, the system and methods can be used to develop profiles of users without user input. Even if a user's profile may be unknown a
priori, a new user may be given an initial profile based data extrapolated from data of existing users using limited geographic information, e.g. a single destination, without user input and without knowing an extensive dataset of past datapoints or destinations for the new user. The user's profile can be updated and/or refined by a self-executing process by recording destinations and other information about individual user such as habits, preferences, reservations, orders, purchases, and so on.

Each algorithm utilizes one or more predetermined variables indicated by an asterisk "*". In one embodiment, the predetermined variables are established for multiple users based in part on expert knowledge or heuristics. In another embodiment, the predetermined variables are established dynamically for individual users. In still another embodiment, the predetermined variables are default values based on assumptions. Examples of minimum, maximum, and typical values of these predetermined variables are shown in Table 4 below.

<table>
<thead>
<tr>
<th>Algorithm</th>
<th>Variable</th>
<th>Min Value</th>
<th>Max Value</th>
<th>Typical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>For A01...AN</td>
<td>dt</td>
<td>&lt;1 second</td>
<td>10000 sec</td>
<td>60 - 600 sec</td>
</tr>
<tr>
<td>A01</td>
<td>T*</td>
<td>&lt;1 min</td>
<td>&gt;60 min</td>
<td>5 - 20 min</td>
</tr>
<tr>
<td>A01</td>
<td>MinVel*</td>
<td>&lt;1 kph</td>
<td>20 kph</td>
<td>2 - 5 kph</td>
</tr>
<tr>
<td>A02</td>
<td>T*</td>
<td>&lt;1 min</td>
<td>&gt;1000 min</td>
<td>10 - 120 min</td>
</tr>
<tr>
<td>A02</td>
<td>DS*</td>
<td>&lt;1 meter</td>
<td>30000 km</td>
<td>10 - 500 meters</td>
</tr>
<tr>
<td>A03</td>
<td>T*</td>
<td>&lt;1 min</td>
<td>&gt;60 min</td>
<td>5 - 20 min</td>
</tr>
<tr>
<td>A03</td>
<td>OT*</td>
<td>0:00</td>
<td>24:00</td>
<td>05:00 - 10:00</td>
</tr>
<tr>
<td>A03</td>
<td>CT*</td>
<td>0:00</td>
<td>24:00</td>
<td>16:00 -21:00</td>
</tr>
<tr>
<td>A03</td>
<td>FD*</td>
<td>Sunday</td>
<td>Saturday</td>
<td>Sun - Tues</td>
</tr>
<tr>
<td>A03</td>
<td>LD*</td>
<td>Sunday</td>
<td>Saturday</td>
<td>Thurs - Sat</td>
</tr>
<tr>
<td>A04</td>
<td>Dist*</td>
<td>&lt;1 km</td>
<td>2500 km</td>
<td>10 - 80 km</td>
</tr>
<tr>
<td>A05</td>
<td>T*</td>
<td>&lt;1 min</td>
<td>&gt;60 min</td>
<td>5 - 20 min</td>
</tr>
<tr>
<td>A05</td>
<td>VelA*</td>
<td>10 kph</td>
<td>150 kph</td>
<td>50 - 80 kph</td>
</tr>
<tr>
<td>A05</td>
<td>VelB*</td>
<td>5 kph</td>
<td>75 kph</td>
<td>10 - 30 kph</td>
</tr>
<tr>
<td>A06</td>
<td>ROW*</td>
<td>&lt;1 meter</td>
<td>1000 meter</td>
<td>10-100 meters</td>
</tr>
<tr>
<td>A07</td>
<td>T*</td>
<td>&lt;1 min</td>
<td>&gt;60 min</td>
<td>5 - 20 min</td>
</tr>
<tr>
<td>A07</td>
<td>MaxTT*</td>
<td>1 min</td>
<td>&gt;600 min</td>
<td>15 - 30 min</td>
</tr>
<tr>
<td>A07</td>
<td>MinTT*</td>
<td>0 min</td>
<td>120 min</td>
<td>0 - 5 min</td>
</tr>
<tr>
<td>A08</td>
<td>T*</td>
<td>&lt;1 min</td>
<td>&gt;60 min</td>
<td>5 - 20 min</td>
</tr>
<tr>
<td>A08</td>
<td>a*</td>
<td>0°</td>
<td>&gt;180°</td>
<td>10° - 40°</td>
</tr>
<tr>
<td>A09</td>
<td>T*</td>
<td>&lt;1 min</td>
<td>&gt;60 min</td>
<td>5 - 20 min</td>
</tr>
<tr>
<td>A09</td>
<td>PTL*</td>
<td>&lt;1 km</td>
<td>100 km</td>
<td>1 - 10 km</td>
</tr>
<tr>
<td>A10</td>
<td>T*</td>
<td>&lt;1 min</td>
<td>&gt;60 min</td>
<td>5 - 20 min</td>
</tr>
<tr>
<td>A10</td>
<td>MaxTT*</td>
<td>1 min</td>
<td>&gt;600 min</td>
<td>15 - 30 min</td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
<td>-------</td>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>A10</td>
<td>MinTT*</td>
<td>0 min</td>
<td>120 min</td>
<td>0 - 5 min</td>
</tr>
<tr>
<td>A11</td>
<td>a*</td>
<td>0°</td>
<td>&gt; 180°</td>
<td>10° - 40°</td>
</tr>
<tr>
<td>A12</td>
<td>T*</td>
<td>&lt; 1 min</td>
<td>&gt;60 min</td>
<td>5 - 20 min</td>
</tr>
<tr>
<td>A13</td>
<td>Dist*</td>
<td>&lt; 1 km</td>
<td>2500 km</td>
<td>10 - 80 km</td>
</tr>
<tr>
<td>A14</td>
<td>MaxTT*</td>
<td>5 min</td>
<td>&gt;600 min</td>
<td>15 - 30 min</td>
</tr>
<tr>
<td>A15</td>
<td>MinTT*</td>
<td>0 min</td>
<td>60 min</td>
<td>0 - 5 min</td>
</tr>
<tr>
<td>A16</td>
<td>PTL*</td>
<td>&lt; 1 km</td>
<td>100 km</td>
<td>1 - 10 km</td>
</tr>
<tr>
<td>A14</td>
<td>G1</td>
<td>10km x 10km</td>
<td>100km x 100km</td>
<td>10 km x 10 km</td>
</tr>
<tr>
<td>A14</td>
<td>G2</td>
<td>1km x 1km</td>
<td>10km x 10km</td>
<td>1km x 1km</td>
</tr>
<tr>
<td>A14</td>
<td>G3</td>
<td>1m x 1m</td>
<td>1km x 1km</td>
<td>100m x 100m</td>
</tr>
<tr>
<td>A-nn</td>
<td>variable*</td>
<td>min value</td>
<td>max value</td>
<td>typical value</td>
</tr>
</tbody>
</table>

In **FIG. 22**, the flowchart shows Algorithm A01 for determining if the current location of mobile device is a destination by measured travel velocity, also known as T-Vel. Such measured travel velocity may be either instantaneous velocity or average velocity. In particular, for a given time T*, the algorithm calculates the T-Vel of the device and determines if device has remained below a pre-determined velocity minimum velocity MinVel*. If the answer is affirmative, then algorithm flags current location as a "candidate" destination subject to verification. This algorithm may be included as a real-time process, a batch process, or both real-time and batch processes.

[0184] In **FIG. 23**, the flowchart shows Algorithm A02 for determining if the current location of mobile device is a destination by measured persistence. In particular, for a given time T*, the algorithm determines if device has remained within a pre-determined spatial tolerance corresponding the destination size DS*. If the answer is affirmative, then algorithm flags current location as a "observed" destination subject to verification. Also, examples of minimum, maximum and typical values for the predetermined variable DS* are shown in Table 5 below.
Table 5. Examples of Predetermined Variable DS* in Algorithm A02

<table>
<thead>
<tr>
<th>Jurisdiction/Boundary</th>
<th>Min Value</th>
<th>Max Value</th>
<th>Typical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situs, e.g. store</td>
<td>1 meter</td>
<td>100 meters</td>
<td>10 - 30 meters</td>
</tr>
<tr>
<td>Neighborhood</td>
<td>10 meters</td>
<td>1000 meters</td>
<td>10 -100 meters</td>
</tr>
<tr>
<td>Zone, e.g airport</td>
<td>100 meters</td>
<td>1 km</td>
<td>500 - 5 km</td>
</tr>
<tr>
<td>Locality, e.g. city</td>
<td>100 meters</td>
<td>20 km</td>
<td>1 km - 10 km</td>
</tr>
<tr>
<td>MSA, e.g. greater city</td>
<td>1000 meters</td>
<td>100 km</td>
<td>10 km - 50 km</td>
</tr>
<tr>
<td>County</td>
<td>2500 meters</td>
<td>500 km</td>
<td>10 km - 100 km</td>
</tr>
<tr>
<td>State</td>
<td>500 km</td>
<td>2500 km</td>
<td>varies</td>
</tr>
<tr>
<td>Province</td>
<td>1000 km</td>
<td>5000 km</td>
<td>varies</td>
</tr>
<tr>
<td>Country</td>
<td>100 km</td>
<td>10000 km</td>
<td>varies</td>
</tr>
<tr>
<td>Continent</td>
<td>5000 km</td>
<td>20000 km</td>
<td>varies</td>
</tr>
<tr>
<td>Ocean</td>
<td>10000 km</td>
<td>30000 km</td>
<td>varies</td>
</tr>
</tbody>
</table>

In another embodiment, the algorithm may be written in any programming language and the source code may be compiled to any executable code that can run on the device 100 or 110 and/or server 200. In addition, the includes the following variables, functions and/or methods:

- **dwTimeStamp**: Time (in seconds since 1/6/1980) of this measurement
- **status**: Response Status
- **dwLat**: Latitude, 180/2^\circ 25 degrees, WGS-84 ellipsoid
- **dwLon**: Longitude, 360/2^\circ 26 degrees, WGS-84 ellipsoid
- **wAltitude**: Altitude, meters, WGS-84 ellipsoid
- **wHeading**: Heading, 360/2^\circ 10 degrees
- **wVelocityHor**: Horizontal velocity, 0.25 meters/second
- **bVelocityVer**: Vertical velocity, 0.5 meters/second
- **accuracy**: Accuracy of the data.
- **fValid**: Flags indicating valid fields in the struct.
- **bHorUnc**: Horizontal uncertainty
- **bHorUncAngle**: Horizontal uncertainty at angle
- **bHorUncPerp**: Horizontal uncertainty perpendicular
bVerUnc: Vertical uncertainty

GPS \text{UTCOffset}: Time difference in seconds between UTC and satellite time

LocProbability: Probability that user's actual position is within the described ellipse, expressed as a percentage

method: Bitmap providing information about the positioning method used to calculate the location.

In FIG. 24, the flowchart shows Algorithm A03 for future location prediction by temporal criteria, e.g. calendar date, time of day, day of week, and so on. In particular, for a given time of day, the algorithm determines if a time of day within a predetermined window such that OT* < time of day <CT*. Also, the algorithm optionally determines if time of day is within the operating hours of potential destinations. If the answer is affirmative, then algorithm flags potential destination as a positive result.

In FIG. 25, the flowchart shows Algorithm A04 for future location prediction by proximity to destination to analysis. In particular, the algorithm determines if potential destination is nearby or in proximity to the mobile device 100 or other electronic device 110. In one embodiment, proximity is determined by measurement of distance as a straight line from the current location to the potential destination. In other embodiments, the proximity may be determined by measurement of driving distance, flying distance, or other travel distance which depend on various factors including the mode of transportation, terrain, geography, and so on. If the answer is affirmative, then algorithm flags potential destination as a positive result.

In FIG. 26, the flowchart shows Algorithm A05 for future location prediction by measured travel velocity also known as T-Vel. Such measured travel velocity may be either instantaneous velocity or average velocity. In particular, after a given time T*, the algorithm determines if velocity of the mobile device 100 or other electronic device 110 is over a first velocity VelA* corresponding to a high speed mode of transportation, e.g. highway, intercity train, airplane, and so on. The algorithm optionally determines if velocity of the mobile device 100 or other electronic device 110 is over a second velocity VelB* corresponding to a moderate speed mode of transportation, e.g. urban transit, local train, city bus, city driving, freighter, bicycle, and so on. If the answer is over VelA*, then algorithm flags mode of transportation as "apparent" high speed mode; if under VelA* and over VelB*, then algorithm flags mode of transportation as "apparent" moderate speed mode; and if under VelB*, then algorithm flags mode of transportation as "apparent" low speed mode. Thus, by implication, the algorithm may ascertain the apparent mode of transportation.

In FIG. 27, the flowchart shows Algorithm A06 for future location prediction by coincidence with transportation corridor. In particular, within a predetermined tolerance ROW*, the algorithm determines if the mobile device 100 or other electronic device 110 is coincident with a transportation
corridor, e.g. highway, transit system, bus route, and so on. If the answer is affirmative, then algorithm flags the type of transportation corridor. Also, the algorithm may optionally determines the actual speed or the estimated speed of the transportation mode and may flag the speed of the transportation mode.

In FIG. 27, the flowchart shows algorithm A07 for future location prediction by dynamic range analysis. In particular, after a given T*, the algorithm determines if potential destination(s) are within the maximum dynamic range of the device. Also, the algorithm may optionally determine if the potential destination(s) are above the minimum dynamic range. In one embodiment, the algorithm calculates the maximum dynamic range as measured travel velocity multiplied by the maximum travel time MaxTT*. In another embodiment, the algorithm calculates the minimum dynamic range as the measured travel velocity multiplied by the minimum travel time MinTT*. If the answer is affirmative, then algorithm flags each potential destination as a positive result.

In FIG. 28, the flowchart shows algorithm A08 for future location prediction by analysis of heading and destination vectors. In particular, after a given T*, the algorithm determines if potential destination vector AP is within an azimuth spread angle a* of heading vector AB. In one embodiment, for each potential direction, the algorithm calculates the direction of the potential destination and determines if direction is between heading +/- 10°. In other embodiments, the azimuth spread angle may be vary from 0 to at least 180°. The heading +/- (l/2)a* creates a so-called 'field of view'. If the answer is affirmative, then algorithm flags each potential destination as a positive result.

In FIG. 29, the flowchart shows algorithm A09 for future location prediction by proximity of destination to heading analysis. In particular, after a given T*, the algorithm determines if potential destination(s) are within a predetermined distance PTL* from the heading vector. In one embodiment, the algorithm first calculates a unit vector AB and then calculates the distance from each potential destination to the heading. First calculating the unit vector is the most efficient method to calculate distance of point to a line, e.g. heading. If the answer is affirmative, then algorithm flags each potential destination as a positive result.

In FIG. 30, the flowchart shows a hybrid algorithm A10 which integrates algorithms A07 and A08 for future location prediction by analysis of heading and destination vectors and dynamic range analysis. In FIG. 32, the flowchart shows a hybrid algorithm A11 which integrates algorithms A04 and A08 for proximity to destination analysis and analysis of heading and destination vectors. In FIG. 33, the flowchart shows a hybrid algorithm A12 which integrates algorithms A04 and A07 for proximity to destination analysis and dynamic range analysis. In FIG. 34, the flowchart shows a hybrid algorithm A13 which integrates algorithms A09 and A07 for proximity to destination to heading and dynamic range analysis.

In addition, querying a datatable may be performed as a batch process rather than a contemporaneous further increasing efficiency. Even if an appropriate datatable is not readily
available, ray tracing and similar methods can be used in a batch process to create the datatable. For example, subdivisions of a political boundary such as precincts may be ray-traced to create appropriate datatables. In another embodiment, to avoid having to load a large datatable on the mobile device, the algorithm may utilize a database broken into multiple datatables that are tiered or cascaded to reduce the size of each datatable. For example, a query to the first tier datatable would return the state or province; a query to the second tier datatable would return the county or district; a query to the third tier datatable would return the city or municipality. Examples of tiered jurisdiction datatables are shown in Table 5 below.

Table 5. Examples of Jurisdiction datatables

<table>
<thead>
<tr>
<th>Latitude</th>
<th>Longitude</th>
<th>Jurisdiction(s), e.g.</th>
<th>datatable ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°</td>
<td>0°</td>
<td>State/Province</td>
<td>000000</td>
</tr>
<tr>
<td>0°</td>
<td>1°W</td>
<td></td>
<td>000001</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36°N</td>
<td>112°W</td>
<td>Arizona</td>
<td>036112</td>
</tr>
<tr>
<td>36°N</td>
<td>113°W</td>
<td>Arizona</td>
<td>036113</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>37°N</td>
<td>112°W</td>
<td>Arizona</td>
<td>037112</td>
</tr>
<tr>
<td>37°N</td>
<td>113°W</td>
<td>Arizona</td>
<td>037113</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>179°N</td>
<td>179°W</td>
<td></td>
<td>179179</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>179°S</td>
<td>0°</td>
<td></td>
<td>359000</td>
</tr>
<tr>
<td>179°S</td>
<td>1°E</td>
<td></td>
<td>359181</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latitude</td>
<td>Longitude</td>
<td>Jurisdiction(s), e.g. county</td>
<td>Datatable ID</td>
</tr>
<tr>
<td>----------</td>
<td>-----------</td>
<td>-----------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>.</td>
<td>.</td>
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<td>.</td>
</tr>
<tr>
<td></td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>36.0°N</td>
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<td>113.0°W</td>
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* Data from Grand Canyon, United States

Datatable 03621126 truncated to Nearest 1/100° of Latitude and 1/100° of Longitude

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<th>Jurisdiction(s), e.g. city/municipality</th>
<th>Datatable ID</th>
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Some examples to illustrate the methods and systems include the following non-exhaustive list of potential applications in Table 6 below:

<table>
<thead>
<tr>
<th>Potential Application</th>
<th>Media Type</th>
<th>Interactivity</th>
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<tbody>
<tr>
<td>Music</td>
<td>Video</td>
<td>Image</td>
</tr>
<tr>
<td>Mobile phone as navigator</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mobile phone as MP3 player</td>
<td>X</td>
<td></td>
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<tr>
<td>Mobile phone as Podcast player</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mobile phone as portable TV</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mobile phone as advertising platform</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mobile phone as portable slide viewer</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Mobile phone as video phone</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mobile phone as e-book reader</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Mobile phone as collaboration tool or as portable white board device</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mobile phone as portable RSS viewer</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mobile phone as voting machine or as polling/ surveying device</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Others. . .</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

[0196] The invention may be practiced on any computer or electronic device capable any manner or form of visual display. All types of computers, computer systems, and computer networks having the
The present invention relates to methods, processes, and systems for creating, adapting, and sharing information using a visual display. The invention can be programmed to operate computer games and interactive programs. Even those without capability of visual display can be programmed to operate a variety of computer games or interactive programs. In addition, many electronic devices can be programmed to operate a computer game or interactive program.

Electronic devices may include any type of computer and computer system such as personal computers, laptop computers, notebook computers, handheld computers, arcade game machines, handheld games, video game systems, video game consoles, video game boxes, personal digital assistants, mobile computing devices, cable boxes, telephones, telecomputing devices, and telecommunication devices. The processes, subprocesses, and algorithms may be processed on a single processor, an array of processors, separated into two portions corresponding to server side or device side, or split in any number of ways. The processor(s) may comprise one or more processors such as a single integrated circuit or multiple integrated circuits having different functions i.e. central processing unit (CPU), input-output (I/O) processing, video processing, audio processing, transmission, reception, and so on. The display(s) may be any type of analog or digital CRT display including monochrome or color monitor, TV, DTV, HDTV, and so on, and any combination of these such as array of CRTs; any flat panel display including but not limited to LCD, TFT, plasma, and so on, or any combination of these such as an array of LCDs; or a analog or digital projection system such as front projection or rear projection of the types manufactured by Sony Electronics of San Diego, CA, and Da-Lite of Warsaw, Indiana, or such as LCD or DLP of the type manufactured by InFocus of Wilsonville, OR, and so on.

The methods and systems of the present invention include processes, subprocesses, and modules which may be used separately, and also in conjunction with one another. Modules may comprise source that is interpreted or the source code may be compiled into executable code. The method and systems may use the results created by any process, subprocess and/or module of this invention for any purpose including but not limited to creating, adapting, or mobilizing web content for viewing on mobile devices.

The methods and systems of the invention also include processes and subprocesses, which may be used separately, and also in conjunction with one another. These may be run independently, in series, in parallel or in any combination. The methods and systems may use the results created by any process and/or subprocess of this invention for any purpose including distributing of targeted message(s), or advertising, marketing, or other promotion.

From the foregoing it will be appreciated that although specific embodiments of the technology have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. For example, the user may lease products or services rather than purchase them outright. Also, the user may provide personal information as consideration in addition to or in lieu of payment for products and services. A message, media, or information may be presented in ways other than visual display. For example, a message or information may be output in an audio form. Further, the invention can be used with
mobile phones, desktop or personal computers, computer terminals, TVs and monitors, video game machines, video game boxes, web TV, cable TV, CCTV, video consoles, laptop computers, notebook computers, handheld computers or tablets, personal digital assistants, telephones, cell phones, pagers, and so on. Accordingly, the invention should be broadly construed and should not be limited.
Claims:
1. A computer-implemented method of retrieving and playing media comprising:
   a user of an electronic device in communication with a server via one or more networks
   wherein the electronic device has at least one browser and at least one media player
   wherein the browser and the media player may reside in a single software application or in
   separate applications;
   wherein a database application is run on the server and the database application can access a
   datatable having information about a plurality of places;
   upon receiving information about the location of the user's device, the database
   application validates the user's electronic device for viewing of information about each place
   and displays in a view at least one object enabling augmented reality comprising: (1) a
generic map marker or (2) a thumbnail image of a media file associated with the place or (3)
alternate text associated with the place or (4) other rating descriptor of the place;
   upon the user initiating a command via the electronic device to indicate a place, the
   server sends the browser a page having at least one image or descriptor corresponding to
   the media file;
   upon the user selecting the image or descriptor corresponding to the media file, the
   browser sends a request to the server for a URL wherein the request identifies the browser
   and identifies a string that is associated with the electronic device;
   if the electronic device is a mobile phone or other electronic device in wireless communication
   with a network of a carrier, the request identifies an IP address that is associated with the
   carrier;
   upon the browser server receiving the request from the browser, a MIME code and a
   codec are selected by the server based on 1) the browser and 2) the string and also 3) the
   IP address if the electronic device is a mobile phone or other electronic device in wireless
   communication with a network of the;
   the media file is encoded using the codec resulting in an encoded wrapper file; the server
   sends the MIME code and the encoded wrapper file to the browser;
   and upon the browser receiving the encoded wrapper file, the media file player plays the
   encoded wrapper file wherein the media player may download or stream the encoded wrapper
   file.

2. The method of claim 1 wherein the location of the user's device is the current location.
3. The method of claim 1 wherein the location of the user's electronic device is a future location predicted by temporal criteria.

4. The method of claim 1 wherein the location of the user's electronic device is a future location predicted by heading or travel direction of the electronic device.

5. The method of claim 1 wherein the location of the user's electronic device is a future location predicted by velocity of the electronic device.

6. The method of claim 1 wherein the information contained the datatable includes at least one link to a media file associated with the place.

7. The method of claim 1 wherein the browser is capable of displaying elements of augmented reality in a 3-D viewing environment.

8. The method of claim 1 wherein the browser is capable of orientating the view using information from a gyro and compass on the mobile device.
FIG. 1A
(PRIOR ART)

1. Place A
2. Place B
3. Place C

FIG. 1B
FIG. 2A
(PRIOR ART)

1. Place A
2. Place B
3. Place C

FIG. 2B
FIG. 3A
(PRIOR ART)

FIG. 3B
1. Place name
   physical address, phone,
   website link, 
   more info link (text and photo only)

FIG. 4A
(PRIOR ART)

Select mapmarker, media link or descriptor, balloon or object to play media on the current device AND/OR Send media and information to phone or other mobile device (text, photos, video and/or audio)

FIG. 4B
Example: Select map marker associated with media to play media or send media to phone or mobile device.

FIG. 5A
Example: Select media link(s) associated with media in balloon to play media or send media to phone or mobile device.

FIG. 5B
Example: Select storefront or virtual sign at storefront having link associated with media to play media or send media to phone or mobile device.

FIG. 5C
Example: Select billboard (located at destination or offsite location) having link associated with media to play media or send media to phone or mobile device.

FIG. 5D
Example: Select fireworks having link associated with media to play media or send media to phone or mobile device.

FIG. 5E
Example: Select spotlights having link associated with media to play media or send media to phone or mobile device.

FIG. 5F
Click to play media

From: [optional]
Message: [optional]

[Optional:] Welcome, <username>

Download Stream

FIG. 6A
MOBILE DEVICES, e.g. mobile phones, PDAs, notebooks, tablets and so on

FIG. 7A
MOBILE DEVICES, e.g. mobile phones, PDAs, notebooks, tablets and so on

FIG. 7B
OTHER DEVICES e.g. desktops, workstations, servers, building automation systems, and so on.

FIG. 8A
OTHER DEVICES e.g. desktops, workstations, servers, building automation systems, and so on.
OTHER DEVICES e.g. desktops, workstations, servers, building automation systems, and so on

FIG. 8C
FIG. 10
2050 Media center

400 (401a,b,c...4NNa,b,c individual image files)

500 (501a,b,c...5NNa,b,c individual video files)

600 (601a,b,c...6NNa,b,c individual audio files)

700 [ 701...7NN Combined audio files (e.g. Playlists of music only) ]

Examples:

701

702

703

704

...
2050 Media center (continued)

800 [ 801...8NN Combined image files (e.g. Slideshows without audio track) ]

Examples:

801

802

803

804

805

800 [ 801...8NN Combined video files (e.g. Videos with or without audio track) ]

Examples:

801

802

803

804

805

FIG. 11B
2050 Media center (continued)

900 [901..9NN Combined media files (e.g. Music accompanied by slideshow or slideshow with audio track)]

Examples:

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<tr>
<th>901</th>
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| 905 | 601a | 601b | 602a | 6NNa,b |

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| 909 | 501.1a | 501.3a | 501.NNNa |

910

| 501.1a | 501.4a | 501.7a | 501.NNNa |

| 911 | 501.1c | 501.4c | 501.7c | 501.NNNc |

FIG. 11C
FIG. 12A

FIG. 12B

FIG. 12C
FIG. 14A

FIG. 14B

FIG. 14C
Fig. 14D

8NN and/or 9NN

Fig. 14E

8NN and/or 9NN
2100 Process audio files

START

2104 Select playlist comprising one or more audio files

2108 Does playlist have more than one audio file?

2112 No

2112 Read audio file

2116 Yes

2116 Read multiple audio files, e.g. music files

2120 Combine these multiple audio files into single audio file

2124 Save as single media file, e.g. audio file

2128 Make file accessible to user

2132 Is there another playlist?

2132 Yes

2132 ...

2132 No

END

FIG. 15A
2140 Process image files

START

2144
Select slideshow comprising one or more image files

2148
Does slideshow have more than one image file?

No

2152
Read image file

Yes

2154
Read multiple image files, e.g. photos or display ads

2160
Combine these multiple image files into single media file, e.g. video

2164
Save as single video file

2168
Make file accessible to user

END

FIG. 15B
2180 Process video files

START

2182 Select playlist comprising one or more video files

2184 Does playlist have more than one video file?

No

2186 Read video file

Yes

2188 Read multiple video files

2190 Combine these multiple video files into single video file

2192 Save as single video file

2194 Make file accessible to user

END

FIG. 15C
2120 Combine audio files into single file

2120.1 Read an audio file

2120.2 Is there another audio file?

2120.3 Yes

2120.4 Read next file

2120.5 Append next file to previous file with overlap and transition between files

2120.6 Append next file to previous file with gap between files

2120.7 Append duplicate file(s) to previous file, e.g. replay or loop back...

FIG. 15D
2160 Combine image files into single file

2160.1 Read an image file

2160.2 Determine total playing time

2160.3 Determine how many images

2160.4 Determine playtime for each image

2160.5 Encode image file as a sequence of frames in a video file

2160.6 Is there another image file?

2160.7 Yes

2160.8 Read next file

2160.9 Encode next image as a sequence of frames in a video file

2160.10 Append next file to previous file with overlap and transition between files, e.g. fade, wipe, etc.

2160.11 Append duplicate file(s) to previous file, e.g. replay or loop back

FIG. 15E
2190 Combine video files into single file

2190.1 Read a video file

2190.2 Determine total playing time

2190.3 Determine how many video files

2190.4 Determine sampling rate for each video

2190.5 Transcode video file as a sequence of frames in a new video file

2190.6 Is there another video file?

No

2190.7 Read next file

Yes

2190.8 Transcode next video as a sequence of frames in a video file

2190.9 Append next file to previous file with overlap and transition between files, e.g. fade, wipe, etc.

2190.10 Append next file to previous file with gap between files

2190.11 Append duplicate file(s) to previous file, e.g. replay or loop back

FIG. 15F
2300 Combine video and audio

START

2310
Read resulting audio file(s)

2312
Read individual audio file(s)

2320
Read resulting video file(s)

2322
Read individual video file(s)

2330
Encode audio file(s) as audio track in video file

2340
Save as single video file

2350
Make file accessible to user

... END

FIG. 15G
2200 Clip Video(s) or other media files

START

2204
Select video

2206
Select duration

2208
Use default, e.g. 5 secs

2212
Select other parameter(s)

2214
Use default parameter(s)

......

2230
Save edited video

2232
Another video?

Yes

No

End

FIG. 15H
2200A Clip Video and Send video clip (or other media file)

START

2202A
Select recipient(s)

2204A
Select video

2206A
Select duration

2208A
Use default, e.g., 5 secs

2212A
Select other parameter(s)

2214A
Use default parameter(s)

...  ...  

2220A
Send edited video

2230A  Save edited video  ...

...  ...

End

FIG. 15I
2250 Edit Video(s) or media files

START

2254

Select video

2256

Select video start point

2258

Use default, e.g. 0 secs

2262

Select duration

2264

Use default, e.g. 15 secs

2266

Select bit rate

2268

Use default, e.g. 30K per sec

2272

Select frame rate

2274

Use default, e.g. 5 fps

2276

Select other parameter(s)

2278

Use default parameter(s)

2290

Another video?

Yes

2294

No

Save edited video

End

FIG. 15J
2250A Edit Video or media file and/or send edited media file

START

2252A Select recipient(s) for your message

2253A Enter subject and/or text portion of message

2254A Select video(s)

2256A Select video start point

2258A Use default, e.g. 0 secs

2262A Select duration

2264A Use default, e.g. 15 secs

2266A Select bit rate

2268A Use default, e.g. 30K per sec

2272A Select frame rate

2274A Use default, e.g. 5 fps

2276A Select other parameter(s)

2278A Use default parameter(s)

... Send edited video

2292A

2294A Save edited video

End

FIG. 15K
2280 Splice Video(s) and/or Send resulting video

START

2281 Select 1st video

2282 Select 2nd video

2284 Select 1st video insertion point

2285 Use default, e.g. end of 1st video

2286 Select 2nd video start point

2287 Use default, e.g. beg of 2nd video

2288 Select duration

2289 Use default, e.g. duration of 2nd video

2290 Select bit rate

2291 Use default, e.g. 30K per sec

2292 Select frame rate

2293 Use default, e.g. 12 fps

2294 Select other parameter(s)

2295 Use default parameter(s)

2296 Combine videos

2297 Another video?

2298 No

2299 Send resulting video

2297 Yes

2283 Select nth video

2288 Save resulting video

End

FIG. 15L
2280A Insert media in Video(s) or media file(s) and/or send resulting media file(s)

START

2281A Select 1st video

2283A Select image

2284A Select video

2285A Select other media file

2286A Select media insertion point

2287A Use default, e.g. 5 secs

2288A Select media duration

2289A Use default, e.g. 10 secs

2290A Select bit rate

2291A Use default, e.g. 1st video

2292A Select frame rate

2293A Use default, e.g. 1st video

2294A Select other parameter(s)

2295A Use default parameter(s)

2296A Insert media, e.g. advertisement

2297A Another image, video or media file?

2298A No

2299A Send resulting media

2299A Save resulting media file

2282A Select nth media file

End

FIG. 15M
Start

2400
User uploads one or more media file(s)

2500
User browses one or more media file(s)

2600
User acquires one or more media file(s)

2700
User defines new playlist(s)

2800
User organizes media files in playlist(s)

2900
Default grouping is applied

3000
User defines schedule

3100
User selects schedule

3200
Default schedule is applied

3300
User sends playlist

3400
Playlist is sent according to a predetermined schedule

3500
Playlist is sent using default schedule

End

FIG. 16A
2400

2410 User selects media type

2420 User types filename (and path to file location)

2430 User clicks “Browse” button

2440 User selects filename(s)

2450 User selects additional filenames

2460 User clicks “Upload” button

2470 File(s) is(are) uploaded to server

2480 Native file(s) is(are) stored in user’s online or offline repository

2490 File(s) is(are) transcoded to another media format

2495 File(s) is(are) saved in transcoded media format

2497 Clip(s) are taken from media file(s)

FIG. 16B
User selects media type

User selects individual media file, category of media file(s), or media search

Text, graphical objects, and/or other descriptor(s) representing media file(s) is(are) presented

Link(s) to online media file(s) are displayed

User selects media file(s) e.g. radio button, check box, or by clicking link through text, descriptor, or graphical object(s)

User login

User purchases or licenses media

User saves link(s) to online or offline repository

Grab Media

User selects recipient(s)

User sends message

User selects media file(s)

User clicks "Download" or "Stream" buttons

Media file is downloaded or streamed

FIG. 16D
2700

2710 User selects media type

2720 Descriptor(s) of existing playlist(s) are displayed

2730 User selects "New Playlist" button

2734 User enters name of new Playlist

2736 User selects predefined name, e.g. "partymix"

2738 Default name is applied, e.g. "playlist01"

2750 User clicks "Add Playlist" button

2760 New playlist is created

2770 User cancels new playlist

FIG. 16E
User selects media type

Descriptor(s) of existing playlist(s) are displayed

Users selects playlist(s)

Descriptors of media file(s) in selected playlist(s) is(are) displayed

Descriptors of featured and/or other media file(s) is(are) displayed

User selects one or more media file(s)

User defines new playlist

User selects existing playlist(s)

A predefined or "default" playlist is applied

User clicks "Add to Playlist" button

Media file(s) is(are) added to selected Playlist

Featured and other media file(s) is(are) added to selected Playlist

FIG. 16F
3000

User selects media type

Descriptor(s) of existing playlist(s) is(are) displayed

Descriptor(s) of media file(s) in existing playlists is(are) displayed

Descriptor(s) of all media files is(are) displayed

Descriptor(s) of newly uploaded media file(s) is(are) displayed

User selects one or more playlist(s)

User selects time(s) of day, e.g. 5PM

User selects day(s) of week, e.g. Mon-Fri

User selects date

User clicks “Save” button

Schedule is saved

FIG. 16G
User selects media type

Descriptors of existing playlist(s) is(are) displayed

Descriptors of media file(s) in existing playlists is(are) displayed

Descriptors of all media files is(are) displayed

Descriptors of newly uploaded media file(s) is (are) displayed

User selects one or more playlist(s)

User selects predefined timeframe, e.g. lunch, afterwork, afterschool, weekend, etc.

User selects predetermined frequency, e.g. each day, one time

User clicks "Save" button

Schedule is saved

FIG. 16H
3300

Select media file(s), e.g. playlist

Select recipient(s), e.g. individual or group

Determine phone number of mobile device for recipient(s), e.g. lookup in a datatable

Number is checked against a registry of carriers to match the carrier in the registry (datatable) and obtain correct MMS address, e.g. lookup in a datatable.

Determine type of mobile device, e.g. lookup in a datatable

Other message variables, e.g. formatting, mime types, etc. are determined from registry, e.g. looked up in a datatable

Other variables, e.g. preferences, are determined from sender's and/or recipient's account or phonebook, e.g. lookup up in a datatable

User sends media file(s) to recipient(s) across across one or more wireless network(s)

FIG. 161
Access user's schedule

Determine current playlist, e.g. lookup in schedule

Determine recipient(s), e.g. lookup in schedule

Determine phone number of mobile device for recipient(s), e.g. lookup in a datatable

Number is checked against a registry of carriers to match the carrier in the registry (datatable) and obtain correct MMS address, e.g. lookup in a datatable.

Determine type of mobile device, e.g. lookup in a datatable

Other message variables, e.g. formatting, mime types, etc. are determined from registry, e.g. looked up in a datatable

Other variables, e.g. preferences, are determined from sender's and/or recipient's account or phonebook, e.g. lookup up in a datatable

Media files(s) is(are) sent to recipient(s) across one or more wireless network(s)
2525, 2625 User selects individual media file(s), category of media files, or media search

2N25.1 User is presented with one or more opportunities to find media (e.g. to enter URL, to select category or classification, to enter search parameters or keywords etc.)

2N25.2 User opts expand the number of opportunities, e.g. advanced search, next pages, all choice, etc.

2N25.3 User action, e.g. enter URL, select category, or enter media search parameters, etc.

2N25.4 Media file(s) are specified by user, e.g. specified URLs, specified filenames, specified file IDs, specific database records, and so on.

2N25.5 Create index of media file(s), e.g. specific URLs, specified files, query of database, and so on.

2N25.6 Retrieve image corresponing to each media file

2N25.7 Result(s) are formatted, e.g. image alone, thumbnail plus link(s), and so on.

2N25.8 Extent of retrieval is determined, e.g. media files in a category or classification, e.g. such as featured, popular, or comedy, sports, movies, news, fashion, celebrities, and so on.

2N25.9 Get index of media file(s) in specific category or classification

2N25.10 Results are formatted, e.g. all results, or in groups of results such as the number of results per page specified by user, or using a default number, image alone, thumbnail plus link(s), and so on.

2N25.11 Extent of search is determined, e.g. all internet, specified website(s), existing databases, a combination or these, and so on.

2N25.12 Execute search for media file(s)

2N25.13 Retrieve remote index file or webpage that contains media file locations, e.g. search results

2N25.14 Parse index file or webpage code

2N25.15 Retrieve URL corresponding to each media file

2N25.16 Find image corresponding to each media file

2N25.17 Search results are formatted, e.g. all results, or in groups of results such as the number of results per page specified by user, or using a default number, and/or image alone, thumbnail plus link(s), and so on.

FIG. 16K
2580, 2680  Grab Media

1. Use command to request media from (local or remote) server or webserver, e.g. PHP extension CURL

2. Receive media file (in whole or in part) from remote server or webserver

3. Media file is saved, e.g. in database

4. Media is transcoded into one or more files, e.g. varying format, codec, bit rate, and/or frame rate, and so on

5. Media is clipped, e.g. a short clip is taken from media

6. Media is edited in another way

7. Edited media file(s) is(are) saved, e.g. user’s media center or online repository

FIG. 16L
FIG. 17

1000
Push message or media process

2000
User request info or media process

3000
Collect information process

4000
Manage information process

5000
Analysis and report information process
(Front-end of "Push message or media" process)

1000

Start application, applet, or other onboard service

1005

Receive RF transmission(s)

1010

Send device identification

1015

Determine geographic variable(s) subprocess

1020

Send geographic variables

1025

Receive data

1030

Message to deliver?

No

1040

Validate message or other info subprocess

Yes

1040

Validate message or other info subprocess

1050

Validated?

No

1060

Request message or media

Yes

1080

Receive message or media

1085

Display message and/or play media

1087

Report message or media delivery

1094

Store record of message delivered

1096

Prompt for user action

User action subprocess

300c

300a and/or 300b

Back-end of process

Internet and/or other network(s)

FIG. 18A
(Front-end of "User information or media request" process)

2000

- Start application, applet, or other onboard service

2005
- Receive RF transmission(s)

2010
- Send device identification

2015
- Determine geographic variable(s) subprocess

2020
- Send geographic variables

2022
- Send RFID(s)

2025
- Receive data

2032
- Check for user request(s)

2033
- User request?

2034/3600
- Yes

2038
- Request for media subprocess

2040
- Receive information

2040
- Validate message or other info subprocess

2050
- Validated?

2060
- Display and/or play information

2065
- Store information locally

2070
- Report information delivery

2076
- Store record of user request

2094
- Prompt for user action

2096
- User action subprocess

300a and/or 300b

300c

Back-end of process

Internet and/or other network(s)

FIG. 18B
(Front-end of "Collect information" process)

3000

Start application, applet, or other onboard service

3005

Receive RF transmission(s)

3010

Send device identification

3015

Determine geographic variable(s) subprocess

3020

Send geographic variables

3030

Check if current location is destination subprocess

3035

Make record of destination subprocess

3041

Send record of destination

3045

Determine clusters of destinations subprocess

3050

Receive data

3056

Send record(s) of user requests, inquiries, order(s), and/or purchase(s) information

3060

Request permission to send user profile

3070

User permission?

No

3074

Yes

Send current user profile

300a and/or 300b

300c

Internet and/or other network(s)

Back-end of process

FIG. 18C
(Front-end of "Manage information" process)

4000

Start application, applet, or other onboard service

4005 → Receive RF transmission(s)

4010 → Send device identification

4015 → Determine geographic variable(s) subprocess

4020 → Send geographic variables

4040 → Receive data

4050 → Request current user profile

4060 → View user information?

4070 → Yes

4075 → Recall stored user profile, information and/or records

4080 → Filter information based on geographic variables, calendar date, time of day, time zone, etc.

4085 → Display and/or play user information

4085 → Change user information?

4090 → Yes

4095 → Input change(s) to user profile, information, or records

4097 → Send change(s) to network

4097 → Store user profile, information, or records

Back-end of process

Internet and/or other network(s)

300a and/or 300b

300c

FIG. 18D
(Front-end of "Analyze and report information" process)
(Back-end of processes 1000-4000)

N000

Start ASP

N004

Connect to network(s)

N012

Receive device identification (ID) and/or telephone number

N018

Lookup other information associated with device ID or telephone number

N022

Receive geographic variable(s)

N024

Receive RFID(s)

N026

Determine additional geographic variable(s), e.g., telephone number, zip code, IP address, and/or other variables

N028

Store geographical variables

N029

Send data

N036

Check for customer order(s)

N037

Customer order(s)?

No

Yes

Process customer order(s), e.g., prepare message, prepare report, and so on

N040

Validate message or other information subprocess

N050

Validated?

No

Yes

Send message or data

N055

Log action taken, e.g., message delivered

N057

FIG. 19A (continued on next sheet)
(Back-end of processes 1000-4000)

(continued from previous sheet)

N032
Check for user request(s)

N033
User request(s)?

Yes

N034/3600
Request for information or media subprocess

No

N037
Send information or media

N039
Log action taken, e.g. information delivered

N042
Receive record of destination

N044
Store record in destination database

N046
Still connected to network?

Yes

No

End ASP

Check if current location is a destination subprocess

Make record of the destination subprocess

FIG. 19B
(Back-end of process 5000)

5010  
Start ASP

5020  
Establish analysis frequency, e.g. daily, weekly, monthly, etc.

5030  
Determine filter(s) for each analysis

5048  
Perform additional analysis of destination database

5045.N  
Determine clusters of destinations subprocess

5050  
Generate report(s) for each analysis

5060  
Time for update?

5070  
Yes

5080  
Special customer request(s)?

5090  
No

5100  
Perform custom analyses on data for customer

5110  
Generate report(s) for special request(s)

Front-end of process

Internet and/or other network(s)

To/from customer(s)

FIG. 19C
(Subprocess: Determine geographic variables)

1015, 2015, 3015,…, N015

N015a  Is GPS available?  No

N015b  Yes

Determine location using GPS or A-GPS

N015c  Store GPS coordinates

N015d  Is other RF Location available?  No

N015e  Yes

Determine location using RF Location

N015f  Store location

N015g  Is narrowcast or NFC signal available?  No

N015h  Yes

Receive information from signal(s)

N015i  Store information, e.g. identification or other information

FIG. 20A
(Subprocess: User action, e.g. in response to prompt for action)

1096, 2096

N096a
Check for user response

N096b
User response within a predetermined time?

Yes

N096e
Remind user that response requested

N096d
User response after reminder?

No

N096f
Determine user's intended action (e.g. inquiry, submit order, make purchase, give feedback)

N096g
Receive additional input from user

N096h
Is external communication required?

No

N096i
Send information via network(s)

N096j
Receive information via network(s)

N096k
Receive additional input from user

N096m
Submit user action (e.g. inquiry, submit order, make purchase, or other user action)

N096n
Store record of user action

FIG. 20B
(Subprocess: Validation of message or other information)

1040, 2040, N040

N1040a Is validation location-based?
Yes 1040b What spatial or kinetic criteria?
No

A04 Nearby destination
A05 Travel Velocity
A07 Approaching destination
A09 Heading/vector analysis
A-NN Other location

1040c Is validation time-based?
Yes 1040d What temporal criteria?
No

A03.1 Time of day
A03.2 ETA
A03.3 Day of week
A03.4 Calendar date
A03.n Other

1040e Is validation residence-based?
Yes 1040f What jurisdiction or boundary?
No

A14/A15/A16/A-NN

City resident
County resident
District resident
State resident
National resident
Other

1040g Other validation?
Yes 1040j What other validation criteria?
No

A17 Demographics (e.g. age, income, education, etc.)
A18 User profile or preferences or favorites
A19 Personal destinations
A05 Mode of Transportation
A-NN Other

FIG. 20C
(Subprocess: Request for media)

Device side

3604
Launch browser
3608
User enters URL, selects bookmark, or default homepage
3612
Browser sends request for URL
3650
Webpage is displayed by browser
3654
User selects a displayed object
3658
Browser sends request to server
3674
MIME code instructs device to play media file corresponding to MIME code
3676
Launch video player or other onboard application
3680
Play media file
3682
Close video player or application
3690
Return to web browsing

Server side

3616
Webserver receives request from browser
3620
Server determines browser
3624
Server determines carrier or network
3630
Server determines device
3636
Server obtains ad from Adserver or other server(s)
3640
Server sends webpage code with appropriate link(s)
3660
Server receives request from browser
3662
Video file?
Yes
3664
Server sends MIME code for video, e.g. video/3gp*, corresponding to browser and/or network as well as wrapper file, e.g. 3gp, using codec corresponding to the device, e.g. H.263, H.264, MP4, etc.
No
3666
Audio file?
Yes
3668
Server sends MIME code for audio, e.g. audio/3gp, corresponding to browser and/or network as well as wrapper file, e.g. 3gp, using codec corresponding to the device, e.g. AMR.
No
3670
Server sends MIME code corresponding to file type, browser and/or network as well as codec corresponding to the device
3672
Return to web browsing

Close

FIG. 20D
(Subprocess: Determine if current location is a destination)

3030, N030

N030a
Recall predetermined spatial tolerance(s)

N030b
Recall predetermined period of time

Which algorithm(s)?

(efficient but over-inclusive)

Algorithm “Determine if destination by measured velocity”

(less efficient and may still be over-inclusive if T* is small)

Algorithm “Determine if destination by measured persistence”

(1st identify “candidate” destination)

A01
Algorithm “Determine if destination by measured velocity”

Is candidate?

Yes

Algorithm “Determine if destination by measured persistence”

No

A02
Algorithm “Determine if destination by measured persistence”

(2nd verify “candidate” destination)

N030d
Flag as a “visited” destination

FIG. 20E
(Subprocess: Make record of visit to destination)

3035, N035

- Is this a "visited" destination?
  - No
  - Yes

N035a1
- Record geographic variables corresponding to this destination, e.g. Lat, Long, or Lat, Long

N035a2
- Record other geographic variables corresponding to this destination, e.g. midpoints of coordinates: (Lat, -Lat)/2, (Long, -Long)/2

N035a3
- Record other geographic variables corresponding to this destination, e.g. MaxLat, MinLat, MaxLong, MinLong

N035a4
- Record other geographic variables corresponding to this destination, e.g. Elevation

N035b
- Record time of arrival at this destination, e.g. T

N035c
- Record time of departure from this destination

N035d
- Record duration of time at this destination

N035e
- Record day of week of visit to this destination

N035f
- Record calendar date of visit this destination

N035g
- Record electronic device ID, telephone number, IP address, or other identifier

N035h
- Record other information for this device and/or destination

FIG. 20F
(Subprocess: Determine featured destinations (aka “Promospots”) by clustering of destinations)

N045.1, 5045.1

N045.1a  Filter destination database by geographical variables within predetermined spatial tolerances

N045.1b  Filter destination database by additional geographical variables with or w/o tolerances

N045.1c  Filter destination database by calendar date, time of day, time zone, day of week, week, month, year, time at destination, etc.

N045.1d  Filter destination database by other variables (e.g. demographics, user preferences, etc.)

N045.1e  Filter destination database by market segment

N045.1f  Sum the total number of visits to featured destination(s)

N045.1g  Sum the number of repeat visits to featured destination(s)

N045.1h  For each calculation above, calculate the ratio or % of visits to featured destination(s) to total visits

N045.1i  Sum the total time spent at all destination(s)

N045.1j  Sum the time spent at featured destination(s)

N045.1k  For each calculation above, calculate the ratio or % of time to total time spent

N045.1m  Sum the number visits to featured destination(s) during opening hours

N045.1n  Sum the number visits to all destination during opening hours of featured destination(s)

N045.1p  Calculate additional base metrics

N045.1q  Calculate additional derived metrics

N045.1r  Store each of the above results

N045.1s  Store other related information

FIG. 21A
(Subprocess: Determine personal destinations (aka “Myspots”) by clustering of destinations of single device)

N045.2a
Filter destination database by geographical variables within predetermined spatial tolerances

N045.2b
Filter destination database by additional geographical variables with or w/o tolerances.

N045.2c
Filter destination database by calendar date, time of day, time zone, day of week, week, month, year, time at destination, etc.

N045.2d
Filter destination database by other variables (e.g. demographics, user preferences, etc.)

N045.2e
Filter destination database by market segment

N045.2f
Sum the total number of visits to each destination

N045.2g
Sum the number of repeat visits to each destination

N045.2h
For each calculation above, calculate the ratio or % of visits for each destination to total visits

N045.2i
Sum the time spent at each destination

N045.2j
For each calculation above, calculate the ratio or % of time to total time spent

N045.2k
Sum the number visits to each destination that occurred between 12:00AM and 5:00AM (between 00:00 and 05:00 hours)

N045.2m
Sum the number visits to each destination that occurred between 9:00AM and 5:00AM (between 09:00 and 17:00 hours)

N045.2n
Calculate additional base metrics

N045.2p
Calculate additional derived metrics

N045.2q
Store each of the above results

N045.2r
Store other related information

FIG. 21B
(Subprocess: Determine destinations of a group of persons such as family, friends, or members of an entity or organization (aka “ouurspots”) by clustering of destinations of a group of persons

3045.3, 5045.3

- **N045.3a**: Filter destination database by geographical variables within predetermined spatial tolerances
- **N045.3b**: Filter destination database by additional geographical variables with or w/o tolerances
- **N045.3c**: Filter destination database by calendar date, time of day, time zone, day of week, week, month, year, time spent at destination, etc.
- **N045.3d**: Filter destination database by other variables (e.g. demographics, user preferences, etc.)
- **N045.3e**: Filter destination database by market segment
- **N045.3f**: Sum the total number of visits to all destinations
- **N045.3g**: Sum the number of visits to each destination
- **N045.3h**: Sum the number of visits to each destination by each member of the group
- **N045.3i**: For each calculation above, calculate the ratio or % of visits to each destination to total visits by all members of group
- **N045.3j**: For each calculation above, calculate the ratio or % of visits to each destination to visits for each member of the group
- **N045.3k**: Sum the time spent at each destination by each member of the group
- **N045.3m**: For each calculation above, calculate the ratio or % of time to total time spent
- **N045.3n**: Sum the number visits to each destination that occurred between 12:00AM and 5:00AM (between 00:00 and 05:00 hours)
- **N045.3p**: Sum the number visits to each destination that occurred between 9:00AM and 5:00PM (between 09:00 and 17:00 hours)
- **N045.3q**: Calculate additional base metrics
- **N045.3r**: Calculate additional derived metrics
- **N045.3s**: Store each of the above results
- **N045.3t**: Store other related information

**FIG. 21C**
(Subprocess: Determine popular destinations (aka “hotspots”) by clustering of destinations of multiple devices)

1. **N045.4a**
   - Filter destination database by geographical variables within predetermined spatial tolerances

2. **N045.4b**
   - Filter destination database by additional geographical variables with or w/o tolerances

3. **N045.4c**
   - Filter destination database by calendar date, time of day, time zone, day of week, week, month, year, time spent at destination, etc.

4. **N045.4d**
   - Filter destination database by other variables (e.g. demographics, user preferences, etc.)

5. **N045.4e**
   - Filter destination database by market segment

6. **N045.4f**
   - Sum the total number of visits to all destinations

7. **N045.4g**
   - Sum the number of visits to each destination

8. **N045.4h**
   - Sum the number of repeat visits to each destination by each unique visitor

9. **N045.4i**
   - For each calculation above, calculate the ratio or % of visits to total visits

10. **N045.4j**
    - Sum the total time spent at each destination

11. **N045.4k**
    - For each calculation above, calculate the ratio or % of time to total time spent

12. **N045.4l**
    - Sum the number of unique visitors to each destination

13. **N045.4m**
    - Sum the number of unique visitors who made repeat visits to each destination

14. **N045.4n**
    - Sum the number of unique visitors who made only a single visit to each destination

15. **N045.4o**
    - For each calculation above, calculate the ratio or % of visitors to total visitors

16. **N045.4p**
    - Calculate the average time spent by a visitor to each destination

17. **N045.4q**
    - Calculate additional base metrics

18. **N045.4r**
    - Calculate additional derived metrics

19. **N045.4s**
    - Store each of the above results

20. **N045.4t**
    - Store other related information

**FIG. 21D**
(Algorithm: Determine if current location is a destination by measured travel velocity)

1. Store current time as $T_0$
   Store current latitude as $Lat_0$ and current longitude as $Long_0$

2. Start time clock, initialize $T_i = T_0$

3. Store $T_i = T_i + dt$

4. Is lapsed time less than predetermined time? e.g. $T_i - T_0 < T^*$
   - No
   - Yes

   Calculate:
   - $Lat_i$ = latitude at time $T_i$
   - $Long_i$ = longitude at time $T_i$
   - $dLat = Lat_i - Lat_0$
   - $dLong = Long_i - Long_0$
   - $Dist = \sqrt{(dLat^2 + dLong^2)}$
   - $|T-Vel| = Speed = \frac{Dist}{(T_i - T_0)}$

5. Has device remained within pre-determined velocity? e.g. $|T-Vel| < MinVel^*$
   - No
   - Yes

   Flag current location as a “candidate” destination subject to verification

6. Flag current location as a “observed” destination having marginal confidence factor

---

**FIG. 22**
(Algorithm: Determine if current location is a destination by measured persistence)

A02

Store current time as $T_0$
Store current latitude as $Lat_0$ and current longitude as $Long_0$

Start time clock, initialize $T_i = T_0$

Store $T_i = T_i + dt$
store $Lat_i =$latitude at time $T_i$ and store $Long_i =$longitude at time $T_i$

Calculate:
$MaxLat = Max (Lat_i, Lat_0)$
$MaxLong = Max (Long_i, Long_0)$
$MinLat = Min (Lat_i, Lat_0)$
$MinLong = Min (Long_i, Long_0)$
$Lat_j = MaxLat$
$Long_j = MaxLong$
$Lat_k = MinLat$
$Long_k = MinLong$

Yes
Is lapsed time less than predetermined time? e.g. $T_i - T_0 < T^*$

No
Has device remained within pre-determined spatial tolerances? e.g. $dMaxDist < DS^*$

No

(e.g., error check for long stop due to traffic congestion on highway, train, plane, etc.)

Yes
Does current location, e.g. $x_i, y_i = Lat_i, Long_i$, correspond to false or unintended destination?

No
Flag current location as a "observed" destination

FIG. 23
(Algorithm: future location prediction by temporal criteria, e.g. time of day, day of week, and so on.)

1. Store current time as $T_0$
2. Determine time of day
3. Determine day of week
4. Is time of day within predetermined window?, e.g. OT* > time of day > CT*
   - No
   - Yes
5. Is day of week within predetermined window?, e.g. FD* > day of week > LD*
   - No
   - Yes
6. Is current time within potential destination’s operating hours?, e.g. $OT_D^* > T_0 > CT_D^*$ (and optionally is ETA within operating hours?) e.g. $OT_D^* > ETA > CT_D^*$
   - No
   - Yes
7. Store current position as PointA = $P(x_0, y_0)$, where $x_0$ is current latitude and $y_0$ is current longitude.
8. Start time clock, Initialize $T_i = T_0$
9. Store $T_i = T_i + dt$
10. Is lapsed time less than predetermined time? e.g. $T_i - T_0 < T^*$
    - Yes
    - No
11. Store position at time $T_i$ as PointB = $P(x_i, y_i)$, where $x_i$ is latitude at $T_i$ and $y_i$ is longitude at time $T_i$.
12. Calculate:
    - VectorAB = $P(x_i, y_i) - P(x_0, y_0)$
    - $Dist_i = \text{magnitude}$(VectorAB)
    - $|\text{Vel}| = \text{Speed} = \text{Dist}_i / (T_i - T_0)$
13. For each potential destination $P$ from $x_i, y_i$ to $x_n, y_n$, calculate:
    - VectorAP = $P(x_n, y_n) - P(x_0, y_0)$
    - $Dist_n = \text{magnitude}$(VectorAP)
    - $ETA = \text{time of day} + \text{Dist}_n / |\text{Vel}|$
14. Flag each potential destination $x_n, y_n$ which has positive result from calendar date, time of day, time zone, day of week, etc.
(Algorithm: Future location prediction by proximity to destination analysis)

Store current latitude as Lat₀ and current longitude as Long₀

For potential destinations \( x_1, y_1 \) to \( x_n, y_n \), Latₙ is latitude of each potential destination and Longₙ is longitude of each potential destination.

Calculate:
\[
\begin{align*}
  dLat &= Lat_n - Lat_0 \\
  dLong &= Long_n - Long_0 \\
  Dist_n &= \sqrt{dLat^2 + dLong^2}
\end{align*}
\]

Is potential destination \( x_n, y_n \) in proximity of device (aka within a predetermined distance or static range)? e.g. \( Dist_n < Dist^* \)

Flag each potential destination \( x_n, y_n \) which has positive result from proximity to destination analysis

Store current position as PointA = \( P(x_0, y_0) \), where \( x_0 \) is current latitude and \( y_0 \) is current longitude.

For potential destinations \( x_1, y_1 \) to \( x_n, y_n \), PointP = \( P(x_n, y_n) \), where \( x_n \) is latitude of each potential destination and \( y_n \) is longitude of each potential destination.

Calculate:
\[
\begin{align*}
  \text{VectorAP} &= P(x_n, y_n) - P(x_0, y_0) \\
  Dist_n &= \text{magnitude}(\text{VectorAP})
\end{align*}
\]

Is potential destination \( x_n, y_n \) in proximity of device (aka within a predetermined distance or static range)? e.g. \( Dist_n < Dist^* \)

Yes

FIG. 25
(Algorithm: Future location prediction by travel velocity, and thus, apparent mode of transportation)

A05

1. Store current time as $T_0$
2. Store current latitude as $\text{Lat}_0$ and current longitude as $\text{Long}_0$
3. Start time clock, initialize $T_i = T_0$
4. Store $T_i = T_i + dt$
5. Is lapsed time less than predetermined time? e.g. $T_i - T_0 < T^*$
   - Yes
   - No
   - Store $\text{Lat}_i = \text{latitude at time } T_i$ and $\text{Long}_i = \text{longitude at time } T_i$
6. Calculate:
   - $d\text{Lat} = \text{Lat}_i - \text{Lat}_0$
   - $d\text{Long} = \text{Long}_i - \text{Long}_0$
   - $\text{Dist}_i = \sqrt{(d\text{Lat}^2 + d\text{Long}^2)}$
   - $|T-Vel| = \text{Speed} = \text{Dist}_i / (T_i - T_0)$
7. Is velocity over a first predetermined speed threshold? e.g. $|T-Vel| > \text{VelA}^*$
   - Yes
   - Flag as “apparent” high-speed transportation mode, e.g. highway, intercity train, plane, etc.
   - No
   - Is velocity over a second predetermined speed threshold? e.g. $|T-Vel| > \text{VelB}^*$
     - Yes
     - Flag as “apparent” moderate speed transportation mode, e.g. urban transit, local train, bus, city driving, freighter, bicycle, etc.
     - No
     - Flag as “apparent” low speed transportation mode, e.g. pedestrian

FIG. 26
(Algorithm: Future location prediction by coincidence with transportation corridor)

1. Store current latitude as Lat, and current longitude as Long.
2. Store point A as x,y = Lat, Long.
3. Lookup transportation corridors nearby current location, e.g. nearby x,y = Lat, Long.
4. If have narrowcast or NFC signal, lookup identifier and other information in database.
5. Does point A coincide with a transportation corridor within predetermined tolerance +/-ROW*,? e.g. highway, transit system, bus route?
   - No
   - Yes
6. What type of transportation corridor?
   - Hi-speed, e.g. highway, intercity rail, plane
   - Moderate speed, e.g. local transit, bus, bicycle, freighter/cruiseship
   - Low speed, e.g. pedestrian, barge
   - Other, e.g. elevators and vertical lift, orbital travel
7. Does “apparent” mode match actual mode?
   - No
   - Yes
8. Flag as positive result from future location prediction from coincidence with transportation corridor

FIG. 27
Algorithm: Future location prediction by dynamic range analysis

1. Store current time as $T_0$ and store current position as PointA=$P(x_0, y_0)$, where $x_0$ is current latitude and $y_0$ is current longitude.

2. Start time clock, initialize $T_1 = T_0$.

3. Store $T_1 = T_1 + dt$.

4. Is lapsed time less than predetermined time? e.g., $T_1 - T_0 < T^*$.
   - Yes: Store position at time $T_1$ as PointB=$P(x_1, y_1)$, where $x_1$ is latitude at $T_1$ and $y_1$ is longitude at time $T_1$.
   - No: Calculate:
     - $VectorAB = P(x_1, y_1) - P(x_0, y_0)$,
     - $Dist_1 = \text{magnitude}(VectorAB)$,
     - $|T-Vel| = \text{Speed} = Dist_1 / (T_1 - T_0)$,
     - $MaxRange = |T-Vel| \times MaxTT^*$

5. For each potential destination $P$ from $x_1, y_1$ to $x_n, y_n$, calculate:
   - $VectorAP = P(x_n, y_n) - P(x_0, y_0)$,
   - $Dist_n = \text{magnitude}(VectorAP)$

6. Is potential destination $x_n, y_n$ within a max dynamic range?, e.g., $Dist_n < MaxRange$.
   - Yes: Is potential destination $x_n, y_n$ within a min dynamic range?, e.g., $Dist_n > MinRange$.
   - No: Flag each potential destination $x_n, y_n$ which has positive result from dynamic range analysis.

FIG. 28
(Algorithm: Future location prediction by analysis of heading and destination vectors)

1. Store current time as $T_0$ and store current position as PointA = $\text{P}(x_0, y_0)$, where $x_0$ is current latitude and $y_0$ is current longitude.

2. Start time clock, initialize $T_i = T_0$.

3. Store $T_i = T_i + dt$.

4. Is lapsed time less than predetermined time? e.g., $T_i - T_0 < T^*$

   - Yes
     - Store position at time $T_i$ as PointB = $\text{P}(x_i, y_i)$, where $x_i$ is latitude at time $T_i$ and $y_i$ is longitude at time $T_i$.
     - Calculate:
       - $\text{VectorAB} = \text{P}(x_i, y_i) - \text{P}(x_0, y_0)$
       - Heading = direction($\text{VectorAB}$)
       - Dist = magnitude($\text{VectorAB}$)
       - $\alpha_L = \text{Heading} - \frac{1}{2}\alpha^*$
       - $\alpha_R = \text{Heading} + \frac{1}{2}\alpha^*$

   - No

5. For each potential destination P from $x_i, y_i$ to $x_n, y_n$, calculate:
   - $\text{VectorAP} = \text{P}(x_n, y_n) - \text{P}(x_0, y_0)$
   - $\text{Dir}_n = \text{direction}($VectorAP$)$

6. Is the direction of potential destination $x_n, y_n$ within the predetermined azimuth spread angle $\alpha^*$ from $\frac{1}{2}\alpha^*$ left to $(1/2)\alpha^*$ right of Heading, e.g., $\alpha_L < \text{Dir}_n < \alpha_R$

   - No
   - Yes

7. Flag each potential destination $x_n, y_n$ which has positive result from vector analysis of heading and destination vectors.

FIG. 29
(Algorithm: Future location prediction by proximity of destination to heading analysis)

- Store current time as $T_0$ and store current position as Point $A = P(x_0, y_0)$, where $x_0$ is current latitude and $y_0$ is current longitude.

- Start time clock, Initialize $T_1 = T_0$

- Store $T_i = T_1 + dt$

- Is lapsed time less than predetermined time? e.g. $T_1 - T_0 < T^*$

- No

- Store position at time $T_i$ as Point $B = P(x_i, y_i)$, where $x_i$ is latitude at $T_i$ and $y_i$ is longitude at time $T_i$.

- Calculate:
  - $\text{VectorAB} = P(x_i, y_i) - P(x_0, y_0)$
  - $\text{Heading} = \text{direction(VectorAB)}$
  - $\text{Dist(A,B)} = \text{magnitude(VectorAB)}$
  - $\text{UnitVectorAB} = \text{VectorAB} / |\text{VectorAB}|$

- For each potential destination $P$ from $x_i, y_i$ to $x_0, y_0$, calculate:
  - $\text{VectorAP} = P(x_i, y_i) - P(x_0, y_0)$
  - $\text{Dist(P,L)} = |\text{UnitVectorAB} \times \text{VectorAP}|$

- Is potential destination $x_0, y_0$ where $\text{Dist(P,L)} < PTL^*$

- Flag each potential destination $x_0, y_0$ which has positive result from proximity of destination to heading (and optionally assign a rating or probability factor to potential destinations)

FIG. 30
(Algorithm: Future location prediction by analysis of heading and destination vectors and dynamic range analysis)

1. Store current time as \( T_0 \) and current position as \( \text{PointA} = P(x_0, y_0) \), where \( x_0 \) is current latitude and \( y_0 \) is current longitude.

2. Start time clock, Initialize \( T_1 = T_0 \)

3. Store \( T_1 = T_1 + \Delta t \)

4. Is lapsed time less than predetermined time? e.g., \( T_1 - T_0 < T^* \)
   - Yes: Store position at time \( T_1 \) as \( \text{PointB} = P(x_i, y_i) \), where \( x_i \) is latitude at \( T_1 \) and \( y_i \) is longitude at time \( T_1 \).
   - No:

5. Calculate:
   - \( \text{VectorAB} = P(x_i, y_i) - P(x_0, y_0) \)
   - \( \text{Heading} = \text{direction} (\text{VectorAB}) \)
   - \( \alpha_L = \text{Heading} - (1/2)\alpha^*; \alpha_R = \text{Heading} + (1/2)\alpha^* \)
   - \( \text{Dist}_i = \text{magnitude} (\text{VectorAB}) \)
   - \( \text{Speed} = \frac{\text{Dist}_i}{(T_1 - T_0)} \)
   - \( \text{MaxRange} = |T - \text{Vel}| \times \text{MaxTT}^* \)

6. For each potential destination \( P \) from \( x_i, y_i \) to \( x_n, y_n \), calculate:
   - \( \text{VectorAP} = P(x_n, y_n) - P(x_0, y_0) \)
   - \( \text{Dist}_n = \text{magnitude} (\text{VectorAP}) \)
   - \( \text{Dir}_n = \text{direction} (\text{VectorAP}) \)

7. Is the potential destination \( x_n, y_n \) within the predetermined azimuth spread angle \( \alpha^* \) from \((1/2)\alpha^* \) left to \((1/2)\alpha^* \) right of Heading, e.g., \( \alpha_L < \text{Dir}_n < \alpha_R \)
   - Yes: Is potential destination \( x_n, y_n \) within a max dynamic range?, e.g., \( \text{Dist}_n < \text{MaxRange} \)
   - No

8. Is potential destination \( x_n, y_n \) within a min dynamic range?, e.g., \( \text{Dist}_n > \text{MinRange} \)
   - Yes
   - No: Flag each potential destination \( x_n, y_n \) which has positive result from analysis of heading and destination vectors and dynamic range analysis

FIG. 31
(Algorithm: Future location prediction by proximity to destination analysis and analysis of heading and destination vectors)

1. Store current time as $T_0$ and store current position as PointA = P($x_0, y_0$), where $x_0$ is current latitude and $y_0$ is current longitude.

2. Start time clock, initialize $T_1 = T_0$.

3. Store $T_1 = T_1 + dt$.

4. Is lapsed time less than predetermined time? e.g. $T_1 - T_0 < T^*$
   - Yes
   - No

5. Store position at time $T_i$ as PointB = P($x_i, y_i$), where $x_i$ is latitude at $T_i$ and $y_i$ is longitude at time $T_i$.

6. Calculate:
   - $\text{VectorAB} = P(x_i, y_i) - P(x_0, y_0)$
   - $\text{Heading} = \text{direction}(\text{VectorAB})$
   - $\alpha L = \text{Heading} - (1/2)\alpha^*$; $\alpha R = \text{Heading} + (1/2)\alpha^*$

7. For each potential destination P from $x_1, y_1$ to $x_n, y_n$, calculate:
   - $\text{VectorAP} = P(x_n, y_n) - P(x_0, y_0)$
   - $\text{Dist}_n = \text{magnitude}(\text{VectorAP})$
   - $\text{Dir}_n = \text{direction}(\text{VectorAP})$

8. Is the potential destination $x_n, y_n$ within the predetermined azimuth spread angle $\alpha^*$ from $(1/2)\alpha^*$ left to $(1/2)\alpha^*$ right of heading, e.g., $\alpha L < \text{Dir}_n < \alpha R$?
   - Yes
   - No

9. Is potential destination $x_n, y_n$ in proximity of device (aka within a predetermined distance or static range) ? e.g., $\text{Dist}_n < \text{Dist}^*$
   - Yes
   - No

10. Flag each potential destination $x_n, y_n$ which has positive result from proximity to destination and heading and vector analyses.

FIG. 32
(Algorithm: Future location prediction by proximity to destination analysis and dynamic range analysis)

1. Store current time as $T_0$ and store current position as $PointA = P(x_0, y_0)$, where $x_0$ is current latitude and $y_0$ is current longitude.

2. Start time clock, initialize $T_i = T_0$.

3. Store $T_i = T_i + dt$.

4. Is lapsed time less than predetermined time? e.g., $T_i - T_0 < T^*$.
   - Yes: Store position at time $T_i$ as $PointB = P(x_i, y_i)$, where $x_i$ is latitude at $T_i$ and $y_i$ is longitude at time $T_i$.
   - No:

5. Calculate:
   - VectorAB = $P(x_1, y_1) - P(x_0, y_0)$
   - Dist(A,B) = magnitude(VectorAB)
   - $|\text{T-Vel}|$ = Speed = Dist(A,B) / ($T_i - T_0$)
   - MaxRange = $|\text{T-Vel}|$ x MaxTT*
   - UnitVectorAB = VectorAB / [VectorAB]

6. Calculate:
   - MinRange = $|\text{T-Vel}|$ x MinTT*

7. For each potential destination $P$ from $x_1, y_1$ to $x_n, y_n$, calculate:
   - VectorAP = $P(x_n, y_n) - P(x_0, y_0)$
   - $\text{Dist}_n$ = magnitude(VectorAP)

8. Is potential destination $x_n, y_n$ within a predetermined Dist* and a max dynamic range? e.g., $\text{Dist}_n < \text{Dist}^*$ and $\text{Dist}_n < \text{MaxRange}$.
   - Yes
   - Is potential destination $x_n, y_n$ within a predetermined Dist* and a min dynamic range? e.g., $\text{Dist}_n < \text{Dist}^*$ and $\text{Dist}_n > \text{MinRange}$.
     - Yes

9. Flag each potential destination $x_n, y_n$ which has positive result from proximity to destination and dynamic range analysis (and optionally assign a rating or probability factor to potential destinations).

FIG. 33
Algorithm: Future location prediction by proximity of destination to heading and dynamic range analysis

1. Store current time as $T_0$ and store current position as Point $A = (x_0, y_0)$, where $x_0$ is current latitude and $y_0$ is current longitude.

2. Start time clock, Initialize $T_1 = T_0$.

3. Store $T_i = T_i + dt$.

4. Check if lapsed time less than predetermined time? e.g., $T_i - T_0 < T^*$.

   - Yes: Store position at time $T_i$ as Point $B = (x_i, y_i)$, where $x_i$ is latitude at $T_i$ and $y_i$ is longitude at time $T_i$.

   - No: Calculate:
     - Vector$_{AB} = P(x_i, y_i) - P(x_0, y_0)$
     - Heading = direction(Vector$_{AB}$)
     - Dist(A,B) = magnitude(Vector$_{AB}$)
     - $|T-Vel| = Speed = Dist(A,B) / (T_i - T_0)$
     - MaxRange = $|T-Vel| x MaxTT^*$
     - UnitVector$_{AB} =$ Vector$_{AB} / |Vector_{AB}|$

5. For each potential destination $P$ from $x_i, y_i$ to $x_n, y_n$ calculate:
   - Vector$_{AP} = P(x_n, y_n) - P(x_0, y_0)$
   - Dist(P, L) = $|UnitVector_{AB} x Vector_{AP}|$

6. Check if potential destination $x_n, y_n$ within a max dynamic range?
   - Yes: Is potential destination $x_n, y_n$ within a min dynamic range?
     - Yes: Flag each potential destination $x_n, y_n$ which has positive result from proximity of destination to heading and dynamic range analysis (and optionally assign a rating or probability factor to potential destinations)
     - No: Is potential destination $x_n, y_n$ within a max range?
       - Yes: e.g., Dist$_n < MaxRange^*$
       - No: Is potential destination $x_n, y_n$ within a min range?
         - Yes: Flag each potential destination $x_n, y_n$ which has positive result from proximity of destination to heading and dynamic range analysis (and optionally assign a rating or probability factor to potential destinations)
         - No: e.g., Dist$_n > MinRange^*$
INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 13/73756

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USPC - 715/852
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) Classification(s): G06T 15/00, 17/00, 19/00 (2014.01)
USPC Classification(s): 715/848, 850, 852

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Keywords: location, region, area, fugure, media, video, music, MIME, augmented reality, virtual reality, database, mobile device, display, 3D

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
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<tr>
<td>Y</td>
<td>US 2012/0204107 A1 (SALINAS, R.), 09 August 2012; claims 4, 7, paragraphs [0121], [0126], [0127], [0222].</td>
<td>1-8</td>
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<td>Y</td>
<td>EP 2400737 A2 (AN, Y. et al.), 28 December 2011; paragraphs [0008], [0012], [0067], [0069], [0071], [0072].</td>
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