Interactive weather advisory system

A broadcast network (10) for selectively transmitting individualized weather output signals to at least one of a plurality of communicator devices remotely located from the broadcast network, the broadcast network comprising:

- a user input database (14) containing a plurality of user-defined parameters with each of the user-defined parameters associated with a particular user and including a user profile, the user profile in each of the user-defined parameters including a user identifier code identifying a communicator device (11) associated with the particular user;
- a weather analysis unit (12) generating, upon demand of the user or continuously, a plurality of individualized weather output signals including weather information within spatial ranges identified by spatial range identifiers and location codes, wherein each spatial range is distinct for each particular user, and wherein the weather output signals derive from a comparison by the weather analysis unit of a location code and a spatial range identifier associated with each particular user with the real-time weather data received from a weather information database (21); and
- a communication network (20) receiving the user identifier codes in the user-defined parameters and the individualized weather output signals, the communication network transmitting each individualized weather output signal to the communicator device identified by the user identifier code in the user profile included in the user-defined parameter.
Description

BACKGROUND OF THE INVENTION

During recent years, the demand for detailed weather information has risen sharply. Personal computers and communication devices have increased the demand for more information because of their power to gather, manipulate, transmit and receive data. As a result, specialized information and value-added services are in great demand. End users no longer desire to gather, manipulate and evaluate raw data. Nowhere is this condition more apparent than with weather services across North America.

Years ago, radio and television broadcasters recognized an increasing demand for weather information from their audience, and thus increased the number of on-air weather segments as a means for increasing market ranking. Today, the demand for specific content in weather information has exceeded the ability of broadcasters to meet this demand. Virtually every facet of business and personal activities are continually influenced by the weather, good or bad.

In the United States, as in most countries, a governmental agency (the National Weather Service in the United States) has the primary responsibility of generating weather products for the general public. These products, such as advisories, statements, and forecasts are generated and made available to third parties, such as broadcasters, newspapers, internet web sites, paging companies and others who, in turn, distribute them to the public. However, this chain of data custody is one way.

Today’s lifestyles are fast-paced and sophisticated. Requests for detailed weather information for specific applications outnumber the governments’ ability to process them. However, adhering to their mandated responsibility, the National Weather Service generates the general products for public consumption twice daily. This condition forces the public to interpret general and outdated advisories to meet their needs. Often, this interpretation is made erroneously. Even worse, these products are usually regional or national in scope, and may not apply to a particular location where various local activities are underway.

By way of example, weather warnings are broadcast by radio stations across the United States. These warnings identify certain weather impacts within a specified area. In most cases, the warning area includes one or more counties, covering dozens to hundreds of square miles (50 to 500 square kilometers). Most often, these threats (such as severe thunderstorms, tornadoes, etc.), only impact a very small zone within the warning area. These threats also move rapidly. As impacts approach specific zones, they are in fact, moving away from other zones, inside the total warning area. Essentially, the existing reporting system is insufficient to specifically identify and adequately warn of personal risk. Furthermore, if the threat is imminent, the existing system cannot and does not provide preventive measures for each user near or at the threat. Thus, by default, distant or unaffected users are placed “on alert” unnecessarily when the threat may be moving away from their location.

Another common example further clarifies the problem. A family, excited to attend the championship golf match this upcoming weekend, closely monitors the local weather forecast. All week-long the forecast has advised fair to partly cloudy weather for the day of the match. Early on that day, the forecast changes to partly cloudy, with a thirty percent chance for late afternoon showers. The family decides to attend the match, believing that the chances for rain are below their perceived risk level. Unknown to the family at midday, some clusters of showers are intensifying, and will place dangerous lightning over the golf match. While the morning weather report was not completely inaccurate, the participants and spectators are exposed to risk. If later asked, it is likely the family members did not hear or remember the weather forecast. They also failed to link their limited knowledge of the weather to their own needs and risk exposure. They did not monitor changing weather events. Most likely, they had no ability to monitor developing risk at the match. Clearly, these people were forced to interpret outdated, limited information, as applied to their specific application.

Therefore, a need exists for a system to automatically and continuously provide consumer customized weather reports, advisories, alerts, forecasts and warnings relevant to a consumer-defined level of need or dynamic spatial location. It is to such a system that the present invention is directed.

SUMMARY OF THE INVENTION

The present invention provides an interactive weather advisory system and method of delivering individualized weather information. More specifically the present invention relates to a broadcast network for selectively transmitting individualized weather output signals to remote communicator devices. The broadcast network includes a user input database, a communicator location database, a weather analysis unit and a communication network.

The user input database contains user-defined parameters and each of the user-defined parameters desirably includes a spatial range identifier and a user profile. The user profile in each of the user-defined parameters at least identifies a communicator device associated with a particular user.

The communicator location database contains real-time data indicative of the spatial locations of the communicator devices. In one preferred version of the present invention, the communicator location database is automatically and/or continuously updated by the communicator devices.

The weather information database contains re-
al-time weather data for at least the spatial locations contained in the communicator location database. The term "weather data" describes a wide variety of weather products, including but not limited to: past and current conditions of weather events; textual products, graphic products, and the like. The weather analysis unit receives the real-time weather data from the weather information database and automatically and continuously compares the spatial range identifier included in the user-defined parameters and the spatial locations of the corresponding communicator devices contained in the communicator location database with the real-time weather data and upon demand of the user, or even continuously, generates an individualized weather output signal including weather information within the spatial range identified by the spatial range identifier for the user-defined parameters. As new locations are defined by the communicator location database, the weather information database is automatically updated in real-time.

[0012] The communication network transmits each individualized weather output signal to the particular communicator device defined in the user profile included in the user-defined parameter corresponding with the real-time weather data and prediction of events. Thus, a user can receive weather information in real-time specific to the user’s immediate spatial location regardless of whether or not the user’s location remains fixed or dynamic throughout time.

[0013] Other advantages and features of the present invention will become apparent to those skilled in the art when the following detailed description is read in view of the attached drawings and appended claims.

[0014] An embodiment of the present invention comprises a broadcast network for selectively transmitting individualized weather output signals to at least one of a plurality of communicator devices remotely located from the broadcast network, the broadcast network comprising: a user input database containing a plurality of user-defined parameters with each of the user-defined parameters associated with a particular user and including a user profile, the user profile in each of the user-defined parameters including a user identifier code identifying a communicator device associated with the particular user; a weather analysis unit generating, upon demand of the user or continuously, a plurality of individualized weather output signals including weather information within spatial ranges identified by spatial range identifiers and location codes, wherein each spatial range is distinct for each particular user, and wherein the weather output signals derive from a comparison by the weather analysis unit of a location code and a spatial range identifier associated with each particular user with the real-time weather data received from a weather information database; and a communication network receiving the user identifier codes in the user-defined parameters and the individualized weather output signals, the communication network transmitting each individualized weather output signal to the communicator device identified by the user identifier code in the user profile included in the user-defined parameter.

[0015] According to an embodiment, the weather analysis unit is provided for generating individualized weather output signals only for communicator devices which are active and/or within a predetermined range.

[0016] According to an embodiment, the weather analysis unit is provided for automatically and continuously comparing the data in the user input database and the weather information database.

[0017] According to an embodiment, a plurality of the location codes specify dynamic locations and the broadcast network further comprises a communicator location database containing real-time data indicative of the dynamic spatial locations of a plurality of the communicator devices.

[0018] According to an embodiment, the user profile in at least some of the user-defined parameters includes at least one weather content identifier, and at least one of the individualized weather output signals is responsive to a weather content identifier corresponding to the real-time weather data.

[0019] According to an embodiment, a plurality of the location codes are indicative of fixed locations.

[0020] According to an embodiment, a plurality of the user-defined parameters include a time identifier, and at least one of the individualized weather output signals is generated responsive to the real-time weather data corresponding to the time identified by one of the time identifiers.

[0021] According to an embodiment, the communication network is adapted to transmit individualized weather output signals to the particular communicator device via a mobile telephone network.

[0022] According to an embodiment, at least one of the user identifier codes identifies at least one of a mobile phone, a pager, a laptop computer, and a personal digital assistant.

[0023] Another embodiment of the present invention comprises a method for providing weather information to a plurality of users located remotely from a broadcast network, including the steps of: inputting a plurality of user-defined parameters into a user input database with each of user-defined parameters including a user profile, the user profile in each of the user-defined parameters including a user identifier code identifying a communicator device associated with a particular user; upon demand of the user or continuously, generating a plurality of individualized weather output signals including weather information within the spatial ranges identified by the spatial range identifiers and the location codes, wherein each spatial range is distinct for each particular user, the weather output signals deriving from a comparison by the weather analysis unit of a location code and a spatial range identifier associated with each particular user with the real-time weather data received from a weather information database; receiving the user identifier codes in the user-defined parameters and the individualized weather output signals; and transmitting the individualized weather output signals to the particular communicator device associated with the particular user.
According to an embodiment, the weather analysis unit compares the real-time weather data with the spatial ranges identified by the spatial range identifiers and the location codes three-dimensionally.

According to an embodiment, the method comprises generating individualized weather output signals only for communicator devices which are active and/or within a predetermined range.

According to an embodiment, the method comprises automatically and continuously comparing the data in the user input database and the weather information database.

According to an embodiment, the communicator network transmits individualized weather output signals to the communicator device via a mobile telephone network.

According to an embodiment, at least one of the user identifier codes identifies at least one of a mobile phone, a pager, a laptop computer, or a personal digital assistant.

According to an embodiment, the method comprises the steps of: compiling a data set of a plurality of spatial locations based on at least one weather content identifier; and outputting the data set to at least one of a plurality of vendors.

According to an embodiment, the method comprises the steps of: compiling a data set of a plurality of user profiles based on at least one weather content identifier; and outputting the data set to at least one of a plurality of vendors.

According to an embodiment, a plurality of the location codes specify dynamic locations and the method further comprises the steps of receiving real-time data indicative of the dynamic spatial locations of a plurality of the communicator devices.

According to an embodiment, in the step of inputting a plurality of user-defined parameters into the user input database, the user profile in at least some of the user-defined parameters includes at least one weather content identifier, and in the step of comparing, at least one of the individualized weather output signals is responsive to a weather content identifier corresponding to the real-time weather data.

According to an embodiment, a plurality of the location codes are indicative of fixed locations.

According to an embodiment, in the step of inputting a plurality of user-defined parameters into a user input database, a plurality of the user-defined parameters include a time identifier, and at least one of the individualized weather output signals is generated responsive to the real-time weather data corresponding to the time identified by one of the time identifiers.

According to an embodiment, the weather analysis unit compares the location codes and spatial range identifiers with the real-time weather data upon demand of the user.

According to an embodiment, at least one of the location codes is selected by the particular user associated with the location code.

According to an embodiment, the spatial range identifier is selected by the particular user associated with the spatial range identifier.

According to an embodiment, the spatial ranges identified by the spatial range identifiers and the location codes are three-dimensional.

According to an embodiment, the weather analysis unit compares the real-time weather data with the spatial ranges identified by the spatial range identifiers and the location codes to generate individualized forecast models used for generating the individualized weather output signals.

According to an embodiment, the weather analysis unit compares the real-time weather data with the user profiles to generate individualized forecast models used for generating the individualized weather output signals.

According to an embodiment, the user receives weather products and advisories as predefined in the user input database upon selection of user-defined parameters by the user.

According to an embodiment, the weather analysis unit compares the parameters in the user input database and the spatial locations of the corresponding communicator devices contained in the communicator location database with an area of concern related to a weather event to generate individualized weather output signals.

According to an embodiment, the method comprises pre-defining weather products and advisories to be received in the user input database when the user selects predetermined user-defined parameters.

An embodiment of the present invention provides for a broadcast network for selectively transmitting individualized weather output signals to at least one of a plurality of communicator devices remotely located from the broadcast network, the broadcast network comprising: a user input database containing a plurality of user-defined parameters with each of the user-defined parameters including a user profile, the user profile in each of the user-defined parameters including a user identifier code identifying a communicator device associated with a particular user; a weather analysis unit automatically and continuously comparing location codes and spatial range identifiers with the real-time weather data received from a weather information database so as to generate a plurality of individualized weather output signals including weather information within the spatial ranges identified by the spatial range identifiers and the location codes; and a communication network receiving the user identifier codes in the user-defined parameters and the individualized weather output signals, the communicat-
tion network transmitting each individualized weather output signal to the particular communicator device identified by the user identifier code in the user profile included in the user-defined parameter.

[0045] In an embodiment of the present invention, a plurality of the location codes specify dynamic locations and the broadcast network further comprises a communicator location database containing real-time data indicative of the dynamic spatial locations of a plurality of the communicator devices.

[0046] In an embodiment of the present invention, the user profile in at least some of the user-defined parameters includes at least one weather content identifier, and at least one of the individualized weather output signals is responsive to a weather content identifier corresponding to the real-time weather data.

[0047] In an embodiment of the present invention, a plurality of the location codes are indicative of fixed locations.

[0048] In an embodiment of the present invention, a plurality of the user-defined parameters include a time identifier, and at least one of the individualized weather output signals is generated responsive to the real-time weather data corresponding to the time identified by one of the time identifiers.

[0049] In an embodiment of the present invention, the communication network transmits individualized weather output signals to the particular communicator device via a mobile telephone network.

[0050] In an embodiment of the present invention, at least one of the user identifier codes identifies at least one of a mobile phone, a pager, a laptop computer, and a personal digital assistant.

[0051] An embodiment of the present invention also relates to a method for providing weather information to a plurality of users located remotely from a broadcast network, comprising the steps of: inputting a plurality of user-defined parameters into a user input database with each of user-defined parameters including a user profile, the user profile in each of the user-defined parameters including a user identifier code identifying a communicator device associated with a particular user; comparing, automatically and continuously, location codes and spatial range identifiers with real-time weather data so as to generate a plurality of individualized weather output signals including weather information within the spatial range identified by the spatial range identifier for a plurality of user-defined parameters; receiving the user identifier codes in the user-defined parameters and the individualized weather output signals by a communication network; and transmitting each individualized weather output signal to the particular communicator device identified by the user identifier code in the user profile included in the user-defined parameter corresponding with the real-time weather data.

[0052] In an embodiment of the present invention, the method further comprises compiling a data set of a plurality of spatial locations based on at least one weather content identifier; and outputting the data set to at least one of a plurality of vendors.

[0053] In an embodiment of the present invention, the method further comprises compiling a data set of a plurality of user profiles based on at least one weather content identifier; and outputting the data set to at least one of a plurality of vendors.

[0054] In an embodiment of the present invention, a plurality of the location codes specify dynamic locations and the method further comprises receiving real-time data indicative of the dynamic spatial locations of a plurality of the communicator devices.

[0055] In an embodiment of the present invention, the user profile in at least some of the user-defined parameters includes at least one weather content identifier when inputting a plurality of user-defined parameters into the user input database, and at least one of the individualized weather output signals is responsive to a weather content identifier corresponding to the real-time weather data, when comparing location codes and spatial range identifiers with real-time weather data.

[0056] In an embodiment of the present invention, a plurality of the user-defined parameters include a time identifier when inputting a plurality of user-defined parameters into a user input database, and at least one of the individualized weather output signals is generated responsive to the real-time weather data corresponding to the time identified by one of the time identifiers.

**BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS**

[0057] Fig. 1 is a block diagram of an interactive weather advisory system constructed in accordance with the present invention.

Fig. 2 is a coordinate system illustrating a spatial location identifier and a spatial range identifier utilized by versions of the present invention.

**DETAILED DESCRIPTION OF INVENTION**

[0058] Referring now to the drawings and more particularly to FIG. 1 shown therein in block diagram form, is an interactive weather advisory system 8, constructed in accordance with the present invention. The weather advisory system 8 is provided with a broadcast network 10 for selectively transmitting individualized weather output signals to remote communicator devices 11. The broadcast network 10 includes a weather analysis unit 12, a user input database 14, a communicator location database 16, and a communication network 20. The weather analysis unit 12 receives real-time weather data from a weather information database 21. The weather information database 21 can be located at the broadcast network 10, or remotely from the broadcast network 10.

[0059] The weather analysis unit 12, the user input data-
tifier, and within the spatial range identified by the spatial location identifier (X2, Y2, Z2), and the spatial range identifier (R2).
as, by way of example but not limitation, government weather information resources, privately operated weather information resources and other various meteorological resources. The real-time weather data could also be either inputted directly at the physical location of the weather information database 21 or inputted via a mobile phone network, a mobile phone network with wireless application protocol, the Internet, aircraft communication systems, email, a personal digital assistant, a laptop computer, regular computer, or other wireless devices.

The communicator location database 16 is an optional feature of the present invention, and is enabled via the signal path 22 when the user requests real-time weather advisories or prediction of events at the dynamic spatial location of the user’s communicator device 11. The communicator location database 16 is continuously updated such that the communicator location database 16 contains real-time data indicative of the spatial locations of the communicator devices 11. In one embodiment, the user identifier code in the user’s profile is transmitted to the communicator location database 16 via the signal path 22. The communicator location database 16 desirably receives data from the communicator devices 11 identified by the user identifier codes via at least one of a variety of possible resources such as a mobile phone network, a mobile phone network equipped with the wireless application protocol technology, global positioning satellite technology, the Internet, loran technology, radar technology, transponder technology or any other type of technology capable of tracking the spatial location of a communicator device 11 and communicating the location of each of the communicator devices 11, such as by the wireless application protocol technology.

The communication network 20 can be, by way of example but not limitation, a mobile phone network, a mobile phone network with wireless application protocol technology, the Internet, a facsimile network, a satellite network (one or two-way), a RF radio network, or any other means of transmitting information from a source to an end user.

The communicator devices 11 can be bidirectional or unidirectional communicator devices. The communicator devices 11 can be, by way of example but not limitation, a portable device, such as a mobile telephone, a smart phone, a pager, a laptop computer or a personal digital assistant or any other electronic device capable of receiving weather information data. Furthermore, the communicator device 11 can be incorporated into an object that is utilized or accessible by the user, such as a helmet, an automobile, or an airplane, for example. While only three communicator devices 11 are represented in Fig. 1 for purposes of illustration, the interactive weather advisory system 8 contemplates the utilization of a large number of communicator devices 11.

The weather analysis unit 12 receives the data in the user input database 14, the communicator location database 16 and the weather information database 21 from the signal paths 24, 26, and 28. The weather analysis unit 12 can be, by way of example but not limitation, a computer desirably programmed to automatically and continuously compare the data in the user input database 14, communicator location database 16 and weather information database 21 so as to generate an individualized weather output signal including weather information within the spatial range identified by the spatial range identifier for each user-defined parameter in the user input database 14. The weather output signals are transmitted to the communication network 20 via the signal path 32.

The weather analysis unit 12 gathers the real-time weather data from the weather information database 21. The term “real-time weather data”, as used herein, refers to weather data which is continually updated so as to indicate current or near current information. In some instances, the “real-time weather data” may be delayed by relatively small increments of five minutes, 15 minutes, or 30 minutes, for example. In other instances, the “real-time weather data” can be provided with substantially no delay. It is expected that the increments will become smaller as communication networks and weather related technology become faster.

The weather analysis unit 12 generates predictions of all weather related events and compares past and current events contained in the weather information database 21 (such as future position, strength, trajectory, etc.), to construct a four-dimensional database. Three dimensions of the database define a physical location on or above the earth’s surface (the spatial location identifier (X1, Y1, Z1)). The fourth dimension is time; past, present or future (identified as T1, T2, T3, T4). By employing high speed computer processors in real-time, the weather analysis unit 12 compares all events (past, current and predicted), at specific positions (X1, Y1, Z1, T1) with identical user supplied data (the user input database; X1, Y1, Z1, R1, T1), and identifies any matches (weather output signals) to the user through the communication network 20 and communication devices 11.

The communication network 20 receives the weather output signals and the user identification codes via the signal paths 32 and 30. In response thereto the communication network 20 transmits the individualized weather output signals to the communicator devices 11 associated with the user identification codes via the signal paths 34a, 34b and 34c such that each user receives the individualized weather information that was requested.

The signal paths 34a, 34b and 34c refer to any suitable communication link which permits electronic communications. For example, the signal paths 34a, 34b and 34c can be point-to-point shared and dedicated communications, infra red links, microwave links, telephone

[0071] The weather analysis unit 12 receives the data in the user input database 14, the communicator location database 16 and the weather information database 21 from the signal paths 24, 26, and 28. The weather analysis unit 12 can be, by way of example but not limitation, a computer desirably programmed to automatically and continuously compare the data in the user input database 14, communicator location database 16 and weather information database 21 so as to generate an individualized weather output signal including weather information within the spatial range identified by the spatial range identifier for each user-defined parameter in the user input database 14. The weather output signals are transmitted to the communication network 20 via the signal path 32.

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[0074] The communication network 20 receives the weather output signals and the user identification codes via the signal paths 32 and 30. In response thereto the communication network 20 transmits the individualized weather output signals to the communicator devices 11 associated with the user identification codes via the signal paths 34a, 34b and 34c such that each user receives the individualized weather information that was requested.

[0075] The signal paths 34a, 34b and 34c refer to any suitable communication link which permits electronic communications. For example, the signal paths 34a, 34b and 34c can be point-to-point shared and dedicated communications, infra red links, microwave links, telephone
Various combinations of weather information can be incorporated into the user input database 14 so as to provide the user with selected and specific weather information. For example, a user traveling in his automobile may wish to be informed by the interactive weather advisory system 8 concerning all hailstorms for an area within a 2.5 mile (4 km) radius of his vehicle as he is traveling from his point of origin to his destination. The user, for example, through his smart phone (communicator device 11) in his vehicle working in conjunction with a mobile phone network (communication network 20) with wireless application protocol, inputs selected information into the user input database 14; namely, the user's smart phone number (user identifier code), icing (weather content identifier), 2.5 mile (4 km) radius (spatial range identifier 24) and spatial location dynamic (spatial location of the user's smart phone is then automatically and continuously monitored), and the like.

The interactive weather advisory system 8 then monitors weather information and predictions of events in the weather analysis unit 12 and transmits the individualized weather output signal to the user's smart phone if a hailstorm is detected or is highly likely to form within a 2.5 mile (4 km) radius of the vehicle along the vehicle's path of travel, for the duration of travel.

The individualized weather output signal can be an audio and/or video data signal. For example, the individualized weather output signal can be a .WAV file or other suitable file containing an animated representation of a real or hypothetical individual speaking an individualized message to the user. In the example given above, the individualized message may be that the hailstorm is 2.5 miles (4 kms) ahead of the vehicle and thus, the user should consider stopping for a short period of time as to avoid the hailstorm. Alternatively, the individualized message may be that the hailstorm is 2.5 miles (4 kms) ahead of the vehicle and thus, the user should consider stopping for a longer time period to avoid the hailstorm. In other words, the weather analysis unit 12 may transmit another individualized weather output signal to the user via the communication network 20 and the communicator devices 11 notifying the user that the weather condition identified by the weather content identifier has passed or is beyond the spatial location identified by the spatial range identifier.

As another example, a user may desire to be informed of all real-time weather data and predictions of events within a particular spatial range of a particular dynamic spatial location. For instance, the user may be interested in whether his aircraft is at risk of icing as he flies from Oklahoma City to Tulsa, Oklahoma. To provide a suitable level of comfort and safety, the user may wish to be informed of icing conditions within 10 miles (16 kms) of the dynamic spatial location of his aircraft. The user, for example, through his smart phone or other suitable avionic device (communicator device 11) in his aircraft working in conjunction with a mobile phone network (communication network 20) with wireless application protocol, inputs selected information into the user input database 14; namely, the user's smart phone number (user identifier code), icing (weather content identifier), 10 mile (16 km) radius (spatial range identifier 24) and the spatial location dynamic. The spatial location of the user's smart phone or other suitable avionic device is then automatically and continuously monitored as the aircraft traverses through time and space from (X1, Y1, Z1, T1) to (X4, Y4, Z4, T4). The interactive weather analysis unit 12 then monitors the real-time weather data in the weather information database 21 and the predicted events in the weather analysis unit 12 so as to transmit the individualized weather output signal to the user's smart phone or other avionic device identifying, if icing is detected or is highly likely to form relevant to a 10 mile (16 km) radius of the aircraft.
time identifier. The weather analysis unit 12 sends, via the signal path 32, the individualized weather output signal to the communication network 20. The communication network 20 receives the user identifier code, via signal path 30, from the user input database 14 and transmits the weather output signal received from the weather analysis unit 12 to the particular communicator device 11 identified by the user identifier code. Thus, the user receives the individualized weather information concerning the spatial location, spatial range and time requested by the user.

The signal paths 22, 24, 26, 28, 30 and 32 can be logical and/or physical links between various software and/or hardware utilized to implement the present invention. It should be understood that each of the signal paths 22, 24, 26, 28, 30 and 32 are shown and described separately herein for the sole purpose of clearly illustrating the information and logic being communicated between the individual components of the present invention. In operation, the signal paths may not be separate signal paths but may be a single signal path. In addition, the various information does not necessarily have to flow between the components of the present invention in the manner shown in FIG. 1. For example, although FIG. 1 illustrates the user identifier code being transmitted directly from the user input database 14 to the communication network 20 via the signal path 30, the user identifier code can be communicated to the weather analysis unit 12 via the signal path 24 and then communicated to the communication network 20 via the signal path 32.

It should be understood that although the user has been described as manually inputting the user identifier code into the user input database 14, the user identifier code could be automatically input into the user input database 14 by the communicator device 11.

Once the user-defined parameters have been input into the user input database 14, the user-defined parameters can be analyzed by the weather analysis unit 12 along with weather content identifiers for purposes of targeted marketing. A plurality of vendors 36 can be provided access to the weather analysis unit 12 of the broadcast network 10 via a plurality of signal paths 38a, 38b, and 38c. The vendors 36 can independently input search information into the weather analysis unit 12 for compiling a data set of information which is useful to the vendors 36.

For example, a particular vendor 36a, who is in the business of selling snow blowers, may input a weather content identifier and time identifier into the weather analysis unit 12 so as to request a list of all user profiles identifying users who resided in spatial locations in the United States which are expected to receive at least 10 inches of snow in the next week. The weather analysis unit 12 would then compile the data set of all spatial locations in United States which are expected to receive at least 10 inches of snow in the next week based on at least one weather content identifier, the time identifier, and the real-time weather data stored in the weather information database 21. The data set is then output to the vendor 36a. Based on the data set, the vendor 36a may send advertisements or additional snow blowers to the areas identified in the data set.

As another example, the particular vendor 36a, who is in the business of selling snow blowers, may input a weather content identifier and time identifier into the weather analysis unit 12 so as to request a list of all user profiles identifying users who resided in spatial locations in the United States which are expected to receive at least 10 inches of snow in the next week. The weather analysis unit 12 would then compile the data set of all spatial locations in United States which is expected to receive at least 10 inches of snow in the next week. The weather analysis unit 12 would then compile the data set of all spatial locations in United States which is expected to receive at least 10 inches of snow in the next week based on at least one weather content identifier, the time identifier, the user profiles and the real-time weather data stored in the weather information database 21. The data set is then output to the vendor 36a. Based on the data set, the vendor 36a may send advertisements to the users who are identified in the data set.

It is envisioned that users will subscribe to the services provided by the broadcast network 10. In this regard, the broadcast network 10 may or may not charge a service fee to the users. In addition, some services may be provided by the broadcast network 10 for one charge and additional services may be provided at an enhanced charge.

To save processing power, the weather analysis unit 12 may periodically determine which communicator devices 11 are turned off or out of range. Once this has been determined, the weather analysis unit 12 would then not generate any individualized weather output signals for the communicator devices 11 which are turned off or out of range. Once a particular one of the communicator devices 11 is turned on or comes within range, the weather analysis unit 12 would then attempt to generate individualized weather output signals for such communicator devices 11. In other words, to save processing power the weather analysis unit 12 may only generate individualized weather output signals for the communicator devices 11 which are active and within range.

The weather analysis unit 12 can be located at the broadcast network 10. Alternatively, the weather analysis unit 12 can be separate from the remainder of the broadcast network 10 and provided as a service to the broadcast network 10.

From the above description, it is clear that the present invention is well adapted to carry out the objects and to attain the advantages mentioned herein as well as those inherent in the invention. While presently preferred embodiments of the invention have been described for purposes of this disclosure, it will be readily understood that numerous changes may be made which will readily suggest themselves to those skilled in the art and which are accomplished within the spirit of the invention as disclosed.
Claims

1. A broadcast network (10) for selectively transmitting individualized weather output signals to at least one of a plurality of communicator devices remotely located from the broadcast network, the broadcast network comprising:

   a user input database (14) containing a plurality of user-defined parameters with each of the user-defined parameters associated with a particular user and including a user profile, the user profile in each of the user-defined parameters including a user identifier code identifying a communicator device (11) associated with the particular user;

   a weather analysis unit (12) generating, upon demand of the user or continuously, a plurality of individualized weather output signals including weather information within spatial ranges identified by spatial range identifiers and location codes, wherein each spatial range is distinct for each particular user, and wherein the weather output signals derive from a comparison by the weather analysis unit of a location code and a spatial range identifier associated with each particular user with the real-time weather data received from a weather information database (21); and

   a communication network (20) receiving the user identifier codes in the user-profile in each of the user-profiles, the user-profiles including a user profile, the user-profiles being transmitted to at least one of a mobile phone, a pager, a laptop computer, and a personal digital assistant.

2. The broadcast network of claim 1, wherein the weather analysis unit (12) is provided for generating individualized weather output signals only for communicator devices (11) which are active and/or within a predetermined range.

3. The broadcast network of claim 1, wherein the weather analysis unit (12) is provided for automatically and continuously comparing the data in the user input database (14) and the weather information database (21).

4. The broadcast network of claim 1 to 3, wherein a plurality of the location codes specify dynamic locations and wherein the broadcast network (10) further comprises a communicator location database (16) containing real-time data indicative of the dynamic spatial locations of a plurality of the communicator devices (11).

5. The broadcast network of any of claims 1 to 4, wherein in the user-profile in at least some of the user-defined parameters includes at least one weather content identifier, and wherein at least one of the individualized weather output signals is responsive to a weather content identifier corresponding to the real-time weather data.

6. The broadcast network of any of claims 1 to 5 wherein in a plurality of the location codes are indicative of fixed locations.

7. The broadcast network of any of claims 1 to 6, wherein in a plurality of the user-defined parameters include a time identifier, and wherein at least one of the individualized weather output signals is generated responsive to the real-time weather data corresponding to the time identifier of one of the time identifiers.

8. The broadcast network of any of claims 1 to 7, wherein in the communication network (20) is adapted to transmit individualized weather output signals to the particular communicator device via a mobile telephone network.

9. The broadcast network of any of claims 1 to 8 wherein at least one of the user identifier codes identifies at least one of a mobile phone, a pager, a laptop computer, and a personal digital assistant.

10. A method for providing weather information to a plurality of users located remotely from a broadcast network (10), comprising the steps of:

    inputting a plurality of user-defined parameters into a user input database (14) with each of user-defined parameters including a user profile, the user profile in each of the user-defined parameters including a user identifier code identifying a communicator device (11) associated with a particular user;

    upon demand of the user or continuously, generating a plurality of individualized weather output signals including weather information within the spatial ranges identified by the spatial range identifiers and the location codes, wherein each spatial range is distinct for each particular user, the weather output signals deriving from a comparison by the weather analysis unit of a location code and a spatial range identifier associated with each particular user with the real-time weather data received from a weather information database (21); and

    transmitting each individualized weather output signal to at least one of a mobile phone, a pager, a laptop computer, and a personal digital assistant.
signal to the communicator device (11) identified by the user identifier code in the user profile included in the user-defined parameter corresponding with the real-time weather data.

11. The method of claim 10, comprising generating individualized weather output signals only for communicator devices (11) which are active and/or within a predetermined range.

12. The method of claim 10, comprising automatically and continuously comparing the data in the user input database (14) and the weather information database (21).

13. The method of claim 10 to 12, wherein the communication network (20) transmits individualized weather output signals to the communicator device (11) via a mobile telephone network.

14. The method of any of claims 10 to 13, wherein at least one of the user identifier codes identifies at least one of a mobile phone, a pager, a laptop computer, or a personal digital assistant.

15. The method of any of claims 10 to 14, further comprising the steps of:
   - compiling a data set of a plurality of spatial locations based on at least one weather content identifier; and
   - outputting the data set to at least one of a plurality of vendors.

16. The method of any of claims 10 to 15, further comprising the steps of:
   - compiling a data set of a plurality of user profiles based on at least one weather content identifier; and
   - outputting the data set to at least one of a plurality of vendors.

17. The method of any of claims 10 to 16, wherein a plurality of the location codes specify dynamic locations and wherein the method further comprises the step of receiving real-time data indicative of the dynamic spatial locations of a plurality of the communicator devices (11).

18. The method of any of claims 10 to 17, wherein in the step of inputting a plurality of user-defined parameters into a user input database (14), the user profile in at least some of the user-defined parameters includes at least one weather content identifier, and wherein in the step of comparing, at least one of the individualized weather output signals is responsive to a weather content identifier corresponding to the real-time weather data.

19. The method of any of claims 10 to 18, wherein a plurality of the location codes are indicative of fixed locations.

20. The method of any of claims 10 to 19, wherein in the step of inputting a plurality of user-defined parameters into a user input database (14), a plurality of the user-defined parameters include a time identifier, and wherein at least one of the individualized weather output signals is generated responsive to the real-time weather data corresponding to the time identified by one of the time identifiers.

21. The broadcast network of any of claims 1-10 or method of claims 11-20, wherein the weather analysis unit compares the location codes and spatial range identifiers with the real-time weather data automatically and continuously.

22. The broadcast network of claims 1-10 or method of claims 11-20, wherein the weather analysis unit compares the location codes and spatial range identifiers with the real-time weather data upon demand of the user.

23. The broadcast network of claims 1-10 or method of claims 11-20 or network or method of claims 21-22, wherein at least one of the location codes is selected by the particular user associated with the location code.

24. The broadcast network of claims 1-10 or method of claims 11-20 or network or method of claims 21-23, wherein the spatial range identifier is selected by the particular user associated with the spatial range identifier.

25. The broadcast network of claims 1-10 or method of claims 11-20 or network or method of claims 21-24, wherein the spatial ranges identified by the spatial range identifiers and the location codes are three-dimensional.

26. The broadcast network of claims 1-10 or method of claims 11-20 or network or method of claims 21-24, wherein the weather analysis unit compares the real-time weather data with the spatial ranges identified by the spatial range identifiers and the location codes to generate individualized forecast models used for generating the individualized weather output signals.

27. The broadcast network of claims 1-10 or method of claims 11-20 or network or method of claims 21-25, wherein the weather analysis unit compares the real-time weather data with the user profiles to generate individualized forecast models used for generating...
the individualized weather output signals.

28. The broadcast network of claims 1-10 wherein the user receives weather products and advisories as predefined in the user input database upon selection of user-defined parameters by the user.

29. The broadcast network of claims 1-10 or method of claims 11-20, wherein the weather analysis unit compares the parameters in the user input database and the spatial locations of the corresponding communicator devices contained in the communicator location database with an area of concern related to a weather event to generate individualized weather output signals.

30. The method of claims 11-20, further comprising predefining weather products and advisories to be received in the user input database when the user selects predetermined user-defined parameters.
### DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
<th>Category</th>
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The present search report has been drawn up for all claims.

Place of search: The Hague

Date of completion of the search: 3 March 2008

Examiner: Olachea, Javier

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