

1. TITLE OF INVENTION

Progressive Welfare Verification and Escalating Intervention Through Television-Based Interaction

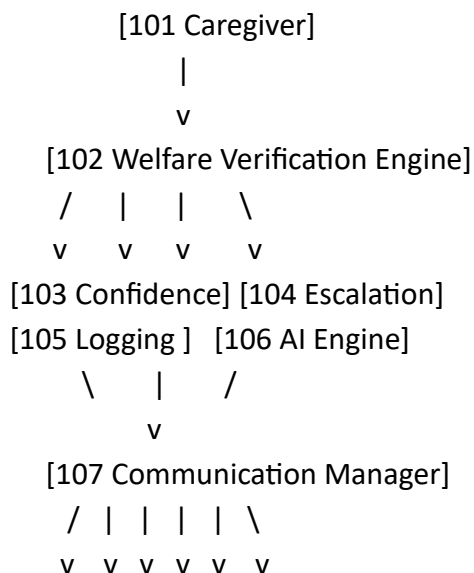
2. CROSS REFERENCE TO RELATED APPLICATIONS

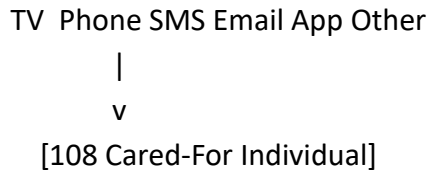
Future continuation, divisional, provisional, or related filings.

3. DRAWINGS

Figure 1 – Overall Progressive Welfare Verification Architecture

Recommended Layout: Vertical architecture diagram.



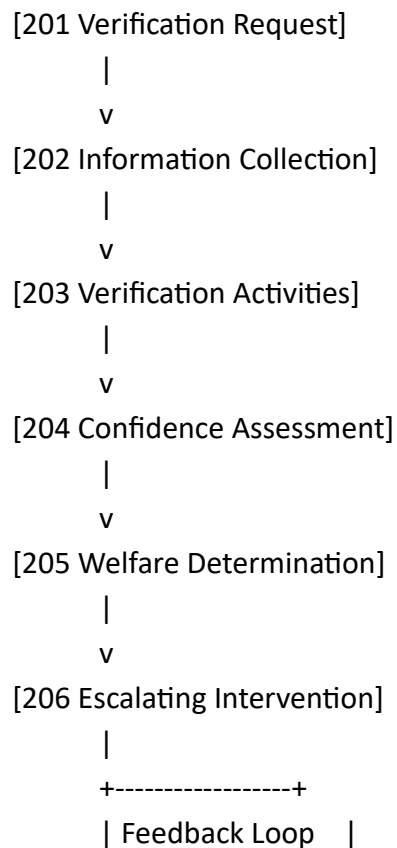


Illustrator Notes:

- Central engine architecture.
- Support modules arranged around engine.
- Communication modalities shown beneath manager.
- Bidirectional arrows between cared-for individual and communication manager.

Figure 2 – Progressive Verification and Welfare Determination Architecture

Recommended Layout: Left-to-right process diagram.



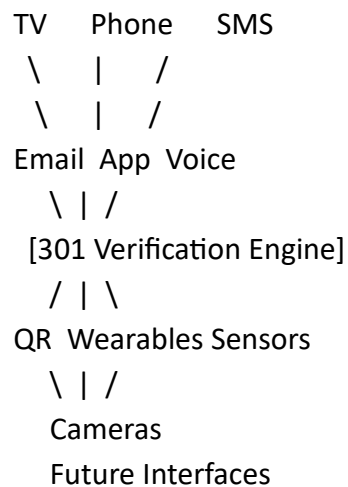
+-----> back to 202

Illustrator Notes:

- Strong feedback loop.
- Emphasize reduction of uncertainty.

Figure 3 – Multi-Modal Communication and Verification Architecture

Recommended Layout: Hub-and-spoke.

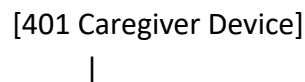


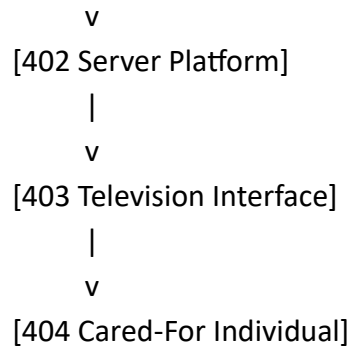
Illustrator Notes:

- Inputs surrounding central verification engine.
- Demonstrates broad invention scope.

Figure 4 – Television-Based Welfare Verification System Architecture

Recommended Layout:





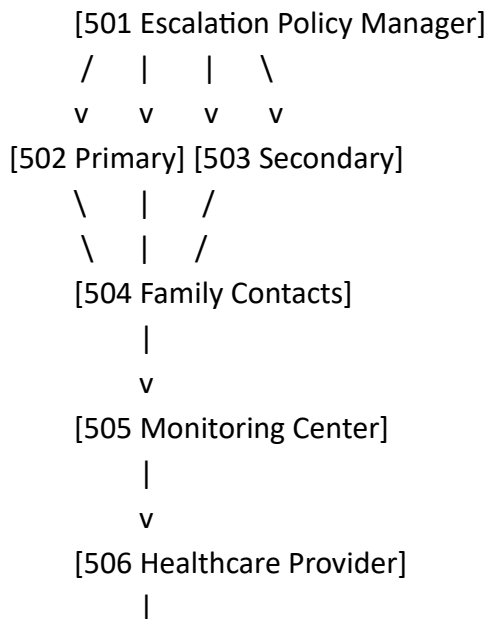
Supporting Blocks:

- [405 Escalation Timer]
- [406 Message Repository]
- [407 Acknowledgement Interfaces]
- [408 Logging System]
- [409 Caregiver Notification System]

Illustrator Notes:

- Supporting blocks positioned around server platform.

Figure 5 – Caregiver Coordination and Escalation Architecture



v
[507 Emergency Contact]

Illustrator Notes:

- Hierarchical escalation tree.

Figure 6 – AI-Assisted Welfare Verification Architecture

Recommended Layout:

[601 Historical Behavior]

[602 Response History]

[603 Sensor Data]

[604 Caregiver Rules]

[605 Environmental Data]

\ | | | /

v

[606 AI Analysis Engine]

|

v

[607 Welfare Confidence]

|

v

[608 Escalation Recommendation]

|

v

[609 Welfare Determination]

Illustrator Notes:

- Funnel inputs into AI engine.

Figure 7 – Welfare Verification Initiation Process

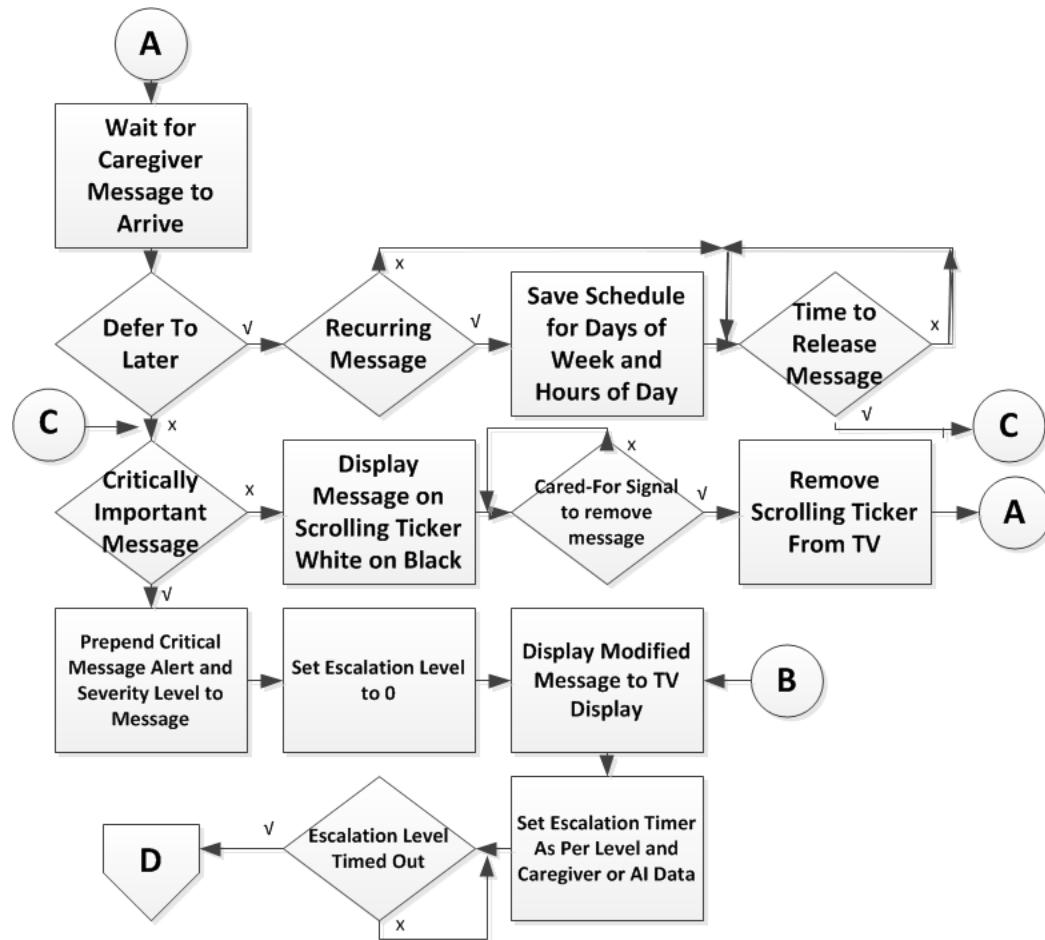


Figure 8 – Progressive Intervention and Escalation Process

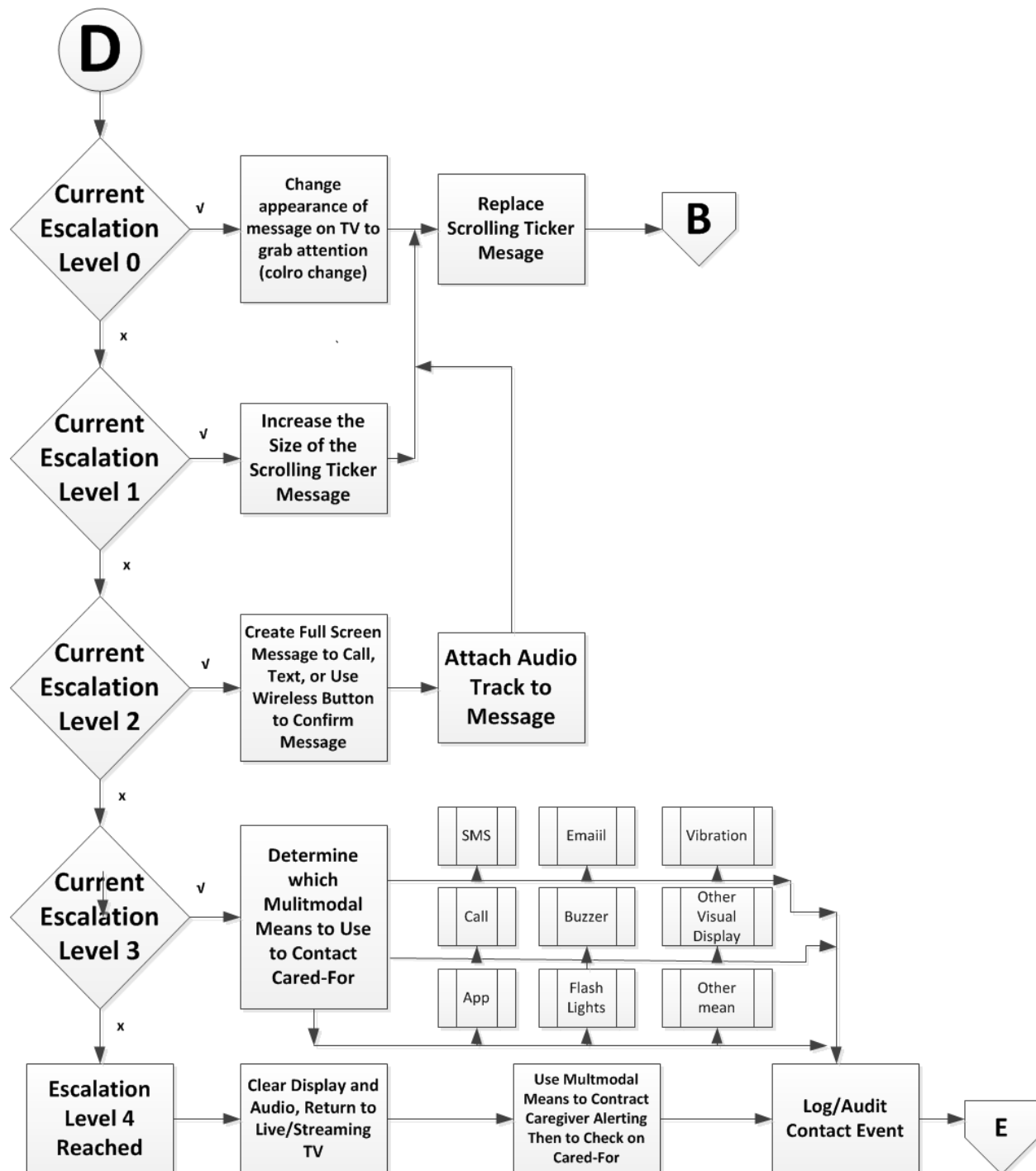


Figure 9 – Confirmation Processing and Escalation Termination Process

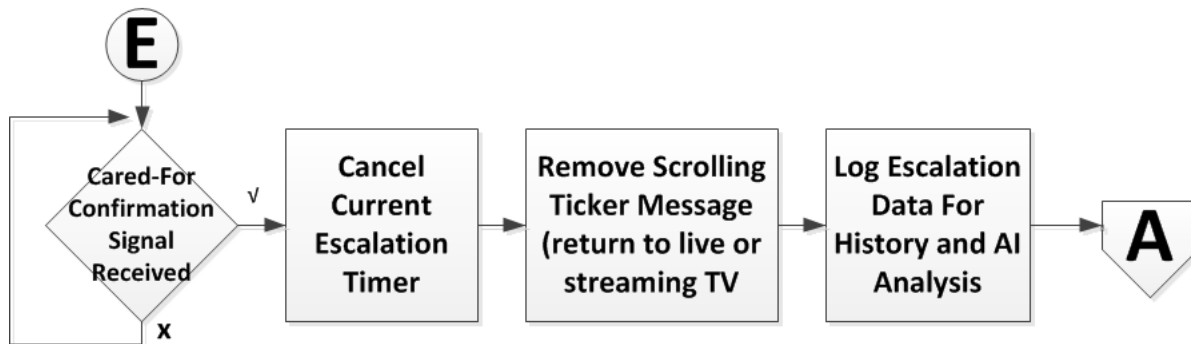
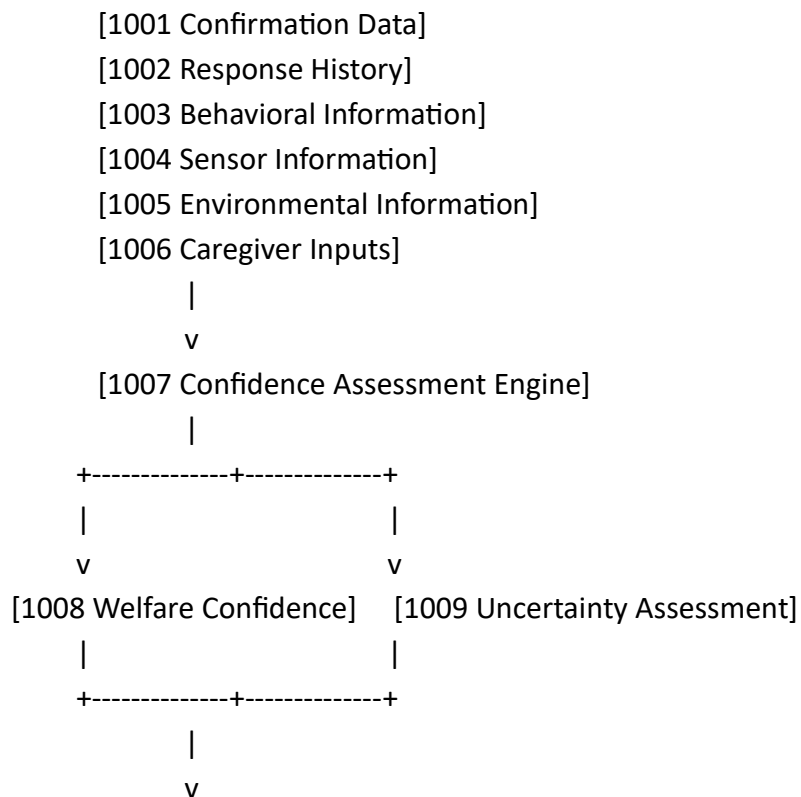
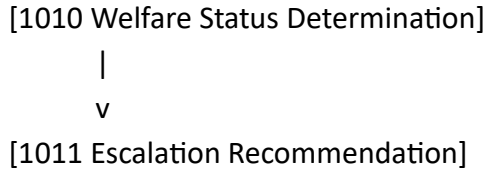


Figure 10 – Welfare Confidence and Uncertainty Assessment Architecture

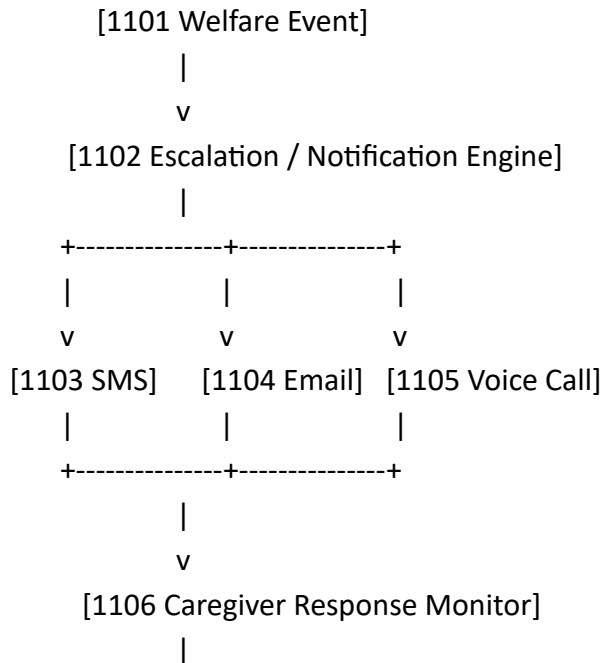


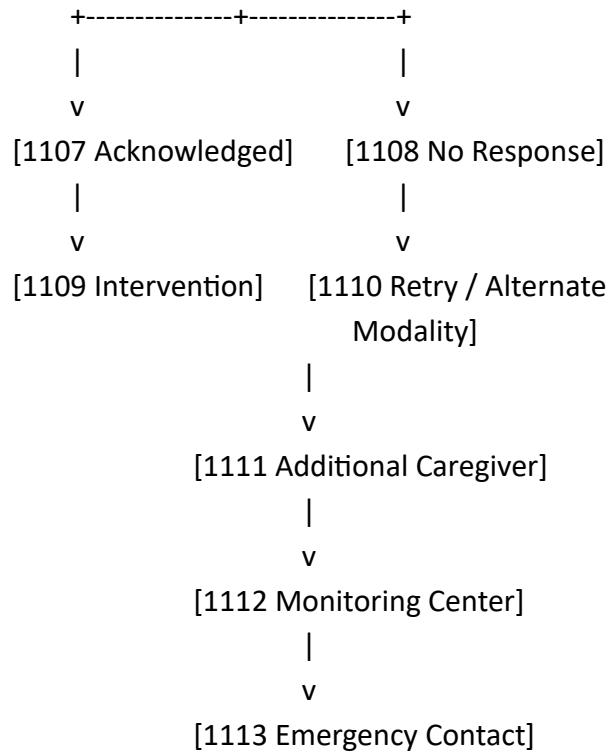


Illustrator Notes:

- Multiple information sources should funnel into the Confidence Assessment Engine.
- Confidence and Uncertainty should be shown as separate outputs.
- Welfare Status Determination should receive inputs from both Confidence and Uncertainty.
- Escalation Recommendation should be generated from the Welfare Status Determination.
- Emphasize the progressive reduction of uncertainty and increasing welfare confidence.

Figure 11 – Multi-Modal Caregiver Notification and Engagement Architecture





=====

4. BACKGROUND OF THE INVENTION

The present invention relates generally to welfare monitoring, caregiver assistance systems, remote verification systems, communication systems, notification systems, and automated escalation systems. More particularly, the invention relates to systems and methods for determining the welfare status of an individual through progressive verification techniques utilizing a television-based interface and one or more associated communication, sensing, response, and escalation mechanisms.

Advances in medicine, pharmaceuticals, healthcare delivery, nutrition, sanitation, and public health have significantly increased life expectancy throughout much of the world. As a result, populations in many countries are aging at an unprecedented rate. Government agencies, healthcare providers, insurers, caregivers, and families are increasingly faced with the challenges associated with supporting a growing population of older adults who desire to maintain independence while continuing to reside within their homes and communities.

At the same time, demographic trends in many regions have resulted in smaller family units, lower birth rates, increased workforce participation, and greater geographic separation among family members. Adult children frequently reside in different cities, states, or countries than their aging parents. Consequently, the responsibility for monitoring the welfare of an elderly individual is often performed remotely and with limited direct observation.

A substantial percentage of older adults live alone or spend significant portions of their day without direct human interaction. While many such individuals remain healthy and independent, others may experience age-related conditions including reduced mobility, sensory impairments, chronic illness, cognitive decline, memory impairment, dementia, Alzheimer's disease, Parkinson's disease, stroke-related limitations, medication-related confusion, or other conditions that may impair their ability to perform routine daily activities or seek assistance when needed.

The prevalence of dementia and Alzheimer's disease continues to increase as populations age. Individuals experiencing cognitive decline may forget appointments, fail to take medications, miss meals, become disoriented, fail to respond to communications, or experience difficulty operating modern communication devices. These conditions can significantly increase caregiver burden and create uncertainty regarding the welfare status of the individual.

Caregiving responsibilities are frequently assumed by spouses, adult children, relatives, friends, neighbors, volunteers, healthcare providers, assisted living personnel, or professional monitoring organizations. Such responsibilities may include confirming daily activity, medication compliance, appointment attendance, meal consumption, wakefulness, mobility, responsiveness, and general well-being. The time required to perform such monitoring may become substantial and may interfere with employment, travel, family responsibilities, and personal health of the caregiver.

In many cultures and societies, caring for elderly family members is considered a significant familial responsibility. Some governmental jurisdictions have enacted laws or policies intended to encourage or require support of elderly parents. Regardless of whether such obligations arise from legal, cultural, moral, or personal considerations, the challenge of determining the welfare of a remotely located individual continues to increase as populations age and family members become geographically dispersed.

Numerous technologies have been developed in an effort to address portions of this problem. Existing systems include telephone-based welfare checks, text messaging systems, electronic mail systems, smartphone applications, medical alert systems, emergency call buttons, wearable devices, fall detection systems, motion sensors, occupancy sensors, video monitoring systems, remote patient monitoring systems, smart speakers, home automation systems, and combinations thereof.

While such systems may provide useful functions, each typically addresses only a limited aspect of welfare monitoring. Telephone calls may be unanswered for reasons unrelated to an emergency. Text messages may be overlooked, ignored, misunderstood, or inaccessible to individuals with visual, cognitive, or technical limitations. Smartphone applications frequently require technical proficiency, account management, software updates, charging, and ongoing interaction that may be difficult for some users. Wearable emergency devices generally require the individual to wear the device and intentionally activate it. Fall detection systems may identify only certain categories of events and may fail to detect numerous situations in which assistance is required. Motion sensors and environmental monitoring systems may indicate activity without providing confirmation of the individual's actual condition or intentions. Video monitoring systems may create privacy concerns and may not be acceptable in many environments.

Many prior-art systems are reactive in nature. Such systems often depend upon the occurrence of a known event, such as a detected fall, activation of an emergency button, generation of an

alarm condition, or transmission of a request for assistance. However, welfare concerns frequently arise before any known emergency has been identified. In many circumstances, a caregiver's primary concern is not responding to a known emergency but determining whether an emergency or welfare concern may exist in the first place.

Accordingly, a distinction exists between emergency detection and welfare verification.

Emergency detection systems typically react to a detected event. Welfare verification systems seek to determine whether an individual is safe, responsive, and functioning normally when the existence of an emergency remains unknown. Existing technologies provide limited capability for proactively determining welfare status in a reliable and scalable manner.

Another limitation of existing systems is that they frequently rely upon a single communication channel or a single response mechanism. If that communication channel is unavailable, ignored, misunderstood, forgotten, disabled, or inaccessible, the system may fail to obtain meaningful information regarding the individual's condition. Furthermore, many systems lack mechanisms for progressively increasing the level of intervention when uncertainty regarding welfare status persists.

Television receivers and television-connected devices remain among the most widely used and familiar electronic devices in the home. Unlike many personal electronic devices, televisions are often located in primary living areas, incorporate large displays, provide audio capabilities, and are routinely utilized by individuals across a broad range of ages and technical abilities. Despite

the widespread presence of televisions within residential environments, existing welfare monitoring systems have generally failed to utilize the television as a primary interface for progressive welfare verification and escalation.

Accordingly, there remains a need for improved systems and methods capable of proactively determining the welfare status of an individual, reducing caregiver burden, supporting independent living, utilizing familiar household interfaces, combining multiple communication and verification mechanisms, and progressively escalating intervention when uncertainty regarding an individual's welfare remains unresolved.

The present invention addresses these and other deficiencies of the prior art.

Another challenge faced by caregivers is uncertainty regarding the actual welfare status of a cared-for individual. In many situations, the caregiver does not know whether a communication was received, viewed, understood, acknowledged, acted upon, ignored, forgotten, or missed due to a medical or environmental circumstance. For example, an unanswered telephone call, an unreturned text message, a missed appointment reminder, or a lack of communication may be caused by a wide range of factors including temporary unavailability, technical issues, hearing impairment, visual impairment, cognitive decline, confusion, illness, injury, loss of consciousness, or other circumstances. As a result, caregivers frequently expend substantial time and effort attempting to determine whether the absence of a response represents a benign situation or a condition requiring intervention.

The uncertainty associated with remote caregiving may create significant emotional, logistical, and financial burdens. Caregivers often perform repeated welfare checks through telephone calls, text messages, electronic mail, video calls, home visits, or contact with neighbors, relatives, or healthcare providers in an attempt to obtain reassurance regarding the condition of the cared-for individual. Such activities may consume considerable time and resources while still failing to provide a reliable determination of the individual's welfare status.

A further limitation of many existing systems is that they are primarily designed to deliver information rather than determine welfare status. Conventional reminder systems, messaging systems, notification systems, and communication platforms are generally concerned with transmitting information from one party to another. While such systems may provide evidence that a message was sent, delivered, displayed, or otherwise transmitted, they frequently provide little or no information regarding whether the recipient actually perceived the communication, comprehended its significance, acknowledged its receipt, acted upon its contents, or remains capable of responding.

Consequently, a distinction exists between communication delivery and welfare verification. Successful delivery of a message does not necessarily establish that the intended recipient is safe, responsive, attentive, cognitively aware, physically capable, or otherwise functioning normally. Similarly, the absence of a response does not necessarily indicate an emergency, but may instead indicate a need for additional information gathering or intervention. Existing systems generally provide limited capability for distinguishing among these possibilities.

A further deficiency of existing systems is the absence of mechanisms capable of performing caregiver-initiated welfare verification when no known emergency condition exists. In many situations, a caregiver simply desires to determine whether a cared-for individual is safe, responsive, aware, capable of communication, or otherwise functioning normally. Existing technologies frequently require the occurrence of a triggering event, alarm condition, detected fall, emergency activation, or other predefined circumstance before meaningful intervention occurs. Consequently, caregivers are often left without an effective means to proactively verify the welfare status of an individual whose condition is unknown.

There further remains a need for systems capable of performing progressive verification rather than relying upon a single communication attempt, a single sensor indication, or a single response mechanism. Because welfare status may not always be determinable from a single interaction, a more effective approach may involve obtaining information from multiple sources, through multiple communication channels, over multiple stages of interaction. Such an approach may increase confidence in the resulting welfare determination while reducing the likelihood of both missed emergencies and unnecessary interventions.

Accordingly, there remains a need for systems capable of progressively reducing uncertainty regarding the welfare status of a remotely located individual. Such systems should be capable of initiating welfare verification in the absence of a known emergency, obtaining information through one or more direct or indirect verification mechanisms, adapting verification efforts

based upon available information, and escalating intervention when sufficient confidence regarding the individual's welfare status cannot be achieved.

The present invention addresses these and other deficiencies of the prior art by providing systems and methods for progressive welfare verification, uncertainty reduction, multi-modal status determination, and escalating intervention directed toward establishing the welfare status of an individual whose condition may otherwise remain unknown.

Existing technologies also provide limited capability for progressively reducing uncertainty regarding an individual's welfare status. Many systems perform a single communication attempt, generate a single notification, monitor a single sensor condition, or respond to a single detected event. When such efforts fail to establish the welfare status of the individual, caregivers are frequently left to determine manually what actions should be taken next. As a result, there remains a need for systems capable of employing progressively increasing levels of verification, communication, monitoring, and intervention in order to obtain greater confidence regarding the welfare status of an individual whose condition is uncertain.

.

=====

5. SUMMARY OF THE INVENTION

The present invention provides systems, methods, apparatus, and computer-implemented processes for performing progressive welfare verification and escalating intervention for

individuals whose welfare status may be uncertain. The invention is directed toward determining the welfare status of a cared-for individual through one or more verification processes designed to progressively reduce uncertainty regarding the individual's condition, responsiveness, safety, well-being, availability, or need for assistance.

In various embodiments, the invention enables a caregiver, family member, healthcare provider, monitoring service, automated scheduling system, artificial intelligence system, or other authorized entity to initiate a welfare verification process. The welfare verification process may be initiated in response to a scheduled event, a caregiver request, a detected condition, a lack of expected activity, an inferred behavioral anomaly, or other circumstances in which verification of an individual's welfare status is desired.

In one aspect of the invention, a welfare verification request is communicated to a cared-for individual through one or more interaction mechanisms. Such interaction mechanisms may include, but are not limited to, television-based interfaces, television-connected devices, smart televisions, mobile devices, telephones, computers, wearable devices, home automation systems, audio systems, visual displays, network-connected devices, or other communication platforms capable of interacting with the cared-for individual.

In a preferred embodiment, the welfare verification request is communicated through a television-based interface. Because televisions are widely available, familiar, and routinely utilized by individuals across a broad range of ages and technical abilities, a television-based

interaction mechanism may provide an effective means for obtaining welfare verification information from individuals who may have difficulty utilizing smartphones, computers, or other modern communication devices.

The invention may obtain verification information through one or more direct or indirect verification mechanisms. Direct verification mechanisms may include acknowledgements, confirmations, responses, selections, button activations, voice responses, telephone responses, text responses, mobile application responses, or other intentional interactions. Indirect verification mechanisms may include activity monitoring, sensor information, environmental conditions, device utilization patterns, behavioral observations, location information, wearable device information, historical activity patterns, inferred behavioral indicators, artificial intelligence analysis, or combinations thereof.

In another aspect of the invention, welfare verification may be performed progressively through multiple stages of interaction. The invention may utilize one or more communication attempts, one or more verification mechanisms, one or more information sources, and one or more decision processes in order to progressively increase confidence regarding the welfare status of the cared-for individual. Information obtained during one stage of verification may influence subsequent verification actions, intervention decisions, communication methods, escalation procedures, confidence assessments, or welfare determinations.

The invention may further perform welfare status determination based upon one or more collected responses, observations, activities, inferred conditions, confidence measurements, behavioral indicators, or other information associated with the cared-for individual. Welfare status determination may include assessing whether the individual is responsive, unresponsive, available, unavailable, active, inactive, safe, potentially at risk, potentially in need of assistance, or otherwise exhibiting conditions relevant to the individual's welfare.

In another aspect of the invention, escalating intervention procedures may be employed when sufficient confidence regarding the welfare status of the individual cannot be achieved.

Escalating intervention may include additional verification attempts, increased message prominence, alternative communication channels, contact with caregivers, contact with family members, contact with neighbors, contact with healthcare providers, contact with monitoring services, contact with emergency services, or other intervention actions intended to obtain additional information or assistance.

The invention may employ configurable rules, policies, schedules, thresholds, priorities, response criteria, confidence criteria, escalation criteria, artificial intelligence techniques, machine learning techniques, behavioral analysis techniques, or combinations thereof to determine appropriate verification actions and intervention procedures. Such determinations may be based upon historical behavior, known routines, caregiver preferences, medical conditions, environmental conditions, prior responses, learned behavioral patterns, or other relevant information.

Among the objectives of the invention are reducing caregiver burden, improving caregiver confidence, supporting independent living, facilitating aging in place, improving welfare determination, reducing uncertainty regarding an individual's condition, enabling proactive intervention, improving communication effectiveness, and increasing the likelihood that welfare concerns are identified and addressed in a timely manner.

The invention may be implemented using a variety of hardware, software, communication, sensing, monitoring, and interaction technologies. While certain embodiments described herein utilize television-based interaction as a preferred mechanism for communicating with and obtaining information from a cared-for individual, the invention is not limited thereto. Other embodiments may utilize alternative communication devices, sensing technologies, monitoring systems, interaction mechanisms, or future technologies capable of supporting progressive welfare verification and escalating intervention.

The foregoing summary is intended to provide a general understanding of certain aspects of the invention and is not intended to limit the scope of the invention as defined by the claims.

Additional features, embodiments, advantages, objectives, and implementations of the invention will become apparent from the following detailed description, accompanying drawings, and appended claims.

=====

6. BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other features, aspects, and advantages of the present invention will become more apparent from the following description, taken in conjunction with the accompanying drawings, in which:

Figure 1 illustrates an example overall architecture of a progressive welfare verification and escalating intervention system in accordance with one embodiment of the invention.

Figure 2 illustrates an example progressive verification and welfare determination architecture in which information is gathered, analyzed, and utilized to reduce uncertainty regarding the welfare status of a cared-for individual.

Figure 3 illustrates an example multi-modal communication and verification architecture incorporating a plurality of communication channels, verification mechanisms, acknowledgement mechanisms, sensors, and interaction interfaces.

Figure 4 illustrates an example television-based welfare verification system architecture in accordance with a preferred embodiment of the invention.

Figure 5 illustrates an example caregiver coordination and escalation architecture showing caregiver hierarchies, escalation policies, monitoring entities, and intervention pathways.

Figure 6 illustrates an example artificial intelligence-assisted welfare verification architecture configured to analyze historical behavior, responsiveness information, environmental data, and other information to assist in welfare determination and escalation decisions.

Figure 7 illustrates an example welfare verification initiation process as a flow diagram of an embodiment in which a welfare verification event is created, scheduled, prioritized, and prepared for presentation to a cared-for individual.

Figure 8 illustrates an example progressive intervention and escalation process as a flow diagram of an embodiment in which communication modalities and intervention activities are progressively increased to reduce uncertainty regarding welfare status.

Figure 9 illustrates an example confirmation processing and escalation termination process as a flow diagram of an embodiment in which confirmation information is received, validated, recorded, and utilized to terminate escalation activities and update welfare determination records.

Figure 10 illustrates an example Welfare Confidence Engine configured to evaluate confirmations, behavioral observations, communication history, sensor information, caregiver inputs, environmental information, and artificial intelligence analysis in order to generate welfare confidence scores, uncertainty measurements, escalation recommendations, and welfare determination outputs.

The drawings are provided for purposes of illustration and explanation and are not intended to limit the scope of the invention. Those skilled in the art will recognize that additional embodiments, configurations, architectures, processes, communication methods, verification

mechanisms, escalation procedures, and implementation variations figure 5 may be employed without departing from the spirit and scope of the invention.

Figure 11 illustrates an example Multi-Modal Caregiver Notification and Engagement Architecture configured to communicate welfare-related information to one or more caregivers through multi-modal communication mechanisms and escalating engagement procedures.

=====

7. DETAILED DESCRIPTION OF THE INVENTION

The following definitions are provided to facilitate understanding of the invention and are not intended to limit the scope of the invention unless expressly stated otherwise.

As used herein, the term "cared-for individual" refers to any person whose welfare status may be monitored, verified, evaluated, assessed, inferred, or otherwise determined through operation of the invention. The cared-for individual may include, without limitation, an elderly individual, family member, parent, child, patient, spouse, relative, friend, neighbor, employee, student, resident, traveler, healthcare recipient, or any other individual whose welfare may be of interest.

The term "caregiver" refers to any person, organization, monitoring service, healthcare provider, governmental entity, family member, friend, volunteer, artificial intelligence system, automated system, or other entity authorized to initiate, receive, monitor, evaluate, or respond to welfare verification activities.

The term "welfare status" refers generally to a determination, assessment, estimate, confidence level, or indication regarding an individual's safety, responsiveness, availability, health, awareness, activity level, condition, need for assistance, or other factors relevant to the individual's well-being.

The term "welfare verification" refers to any process intended to obtain information regarding the welfare status of an individual.

The term "progressive verification" refers to a verification process in which information is obtained through one or more stages, interactions, observations, communications, monitoring activities, or intervention activities designed to progressively increase confidence regarding welfare status.

The term "escalating intervention" refers to the use of progressively increasing levels of communication, monitoring, notification, attention-getting mechanisms, verification attempts, or third-party involvement intended to reduce uncertainty regarding welfare status.

The term "confirmation" refers to any direct or indirect indication that a welfare verification request, message, notification, alert, instruction, inquiry, or communication has been received, acknowledged, understood, acted upon, or otherwise addressed.

The term "communication channel" refers to any mechanism capable of conveying information to or from an individual, including visual, audio, tactile, electronic, network, wireless, wired, mechanical, or future communication technologies.

The term "verification mechanism" refers to any method by which welfare status information may be obtained, inferred, estimated, observed, measured, detected, communicated, or otherwise determined.

The term "welfare confidence" refers to a measure, score, probability, assessment, or indication representing the degree of confidence associated with a welfare determination.

The term "welfare uncertainty" refers to the degree to which the actual condition, status, responsiveness, safety, or well-being of a cared-for individual remains unknown.

The term "confidence threshold" refers to a configurable confidence level that may be used to determine whether escalation should continue, be modified, or be terminated.

The term "verification state" refers to an operational stage within a progressive welfare verification process.

The term "intervention state" refers to an operational stage associated with escalating intervention activities.

Unless expressly stated otherwise, references to televisions, displays, telephones, smartphones, wearable devices, sensors, networks, communication systems, artificial intelligence systems, and other technologies are intended to be illustrative examples and not limitations of the invention. In addition, unless explicitly stated otherwise, communication-related techniques disclosed herein may be applied to communications directed toward cared-for individuals,

caregivers, monitoring organizations, healthcare providers, emergency contacts, family members, service providers, or other participants in the welfare-verification ecosystem

General System Architecture

Referring now to Figure 1, an example of the overall progressive welfare verification architecture is illustrated including caregiver 101, welfare verification engine 102, confidence assessment engine 103, escalation engine 104, logging system 105, artificial intelligence engine 106, communication manager 107, and cared-for individual 108.

The invention provides a progressive welfare verification and escalating intervention architecture configured to determine the welfare status of a cared-for individual while reducing uncertainty regarding that individual's condition.

In one embodiment, the invention includes one or more caregiver interfaces 101, one or more welfare verification engines 102, one or more communication management systems 107, one or more escalation engines 104, one or more logging systems 105, one or more confirmation processing systems, one or more welfare determination systems 205, and one or more interaction devices associated with the cared-for individual.

A caregiver interface 101 may allow one or more caregivers to initiate welfare verification requests, review verification status, configure escalation rules, establish notification procedures,

review historical activity, examine verification logs, and manage one or more cared-for individuals.

A welfare verification engine 102 may generate, schedule, coordinate, evaluate, and manage welfare verification activities. Such activities may be initiated manually by a caregiver, automatically according to schedules, in response to detected conditions, in response to behavioral anomalies, or in response to other triggering events.

A communication management system 107 may be configured to communicate welfare verification requests, messages, reminders, alerts, notifications, instructions, inquiries, and escalation actions through one or more communication channels.

An escalation engine 104 may determine when additional verification actions should occur and may coordinate escalating intervention procedures when sufficient confidence regarding welfare status has not been achieved.

A welfare determination system 205 may evaluate information collected through one or more verification mechanisms and determine one or more welfare status indicators, confidence levels, risk levels, intervention recommendations, escalation requirements, or related assessments.

A logging system 105 may record substantially all activities associated with welfare verification, including verification requests, communication attempts, message presentations, escalation events, confirmations, acknowledgements, responses, intervention activities, and welfare

determinations. The logging system 105 may further maintain chronological audit trails linking verification request 201, confidence assessment 204, welfare determination 205, and escalating intervention 206, thereby documenting the progression of a welfare verification event.

In certain embodiments, the invention may further utilize one or more databases, repositories, data stores, historical archives, knowledge stores, or other storage mechanisms configured to maintain caregiver information, cared-for individual information, communication histories, escalation histories, confirmation records, welfare confidence measurements, behavioral profiles, responsiveness metrics, intervention records, audit logs, artificial intelligence training data, machine learning models, and other information utilized by the invention. Such information may be stored locally, remotely, within cloud-based infrastructures, within distributed architectures, or within combinations thereof.

Progressive Welfare Verification

Referring now to Figure 2, welfare verification may proceed through verification request 201, information collection 202, verification activities 203, confidence assessment 204, welfare determination 205, and escalating intervention 206.

In operation, a welfare verification request may be generated for a cared-for individual. The request may be generated in response to a scheduled event, medication reminder, appointment reminder, caregiver request, wellness check, detected condition, behavioral anomaly, inactivity condition, emergency event, post-surgical monitoring requirement, dementia-related care plan, assisted living protocol, healthcare procedure, or any other circumstance in which verification of welfare status may be desirable.

Upon generation of a welfare verification request, the invention may communicate information to the cared-for individual through one or more interaction mechanisms.

Unlike conventional messaging systems whose primary objective is delivery of information, the present invention seeks to obtain information regarding the welfare status of the cared-for individual.

Accordingly, the communication itself may be viewed as one component of a larger welfare verification process.

The invention may collect information from direct responses, indirect responses, observed activities, monitored conditions, inferred behaviors, historical information, environmental conditions, sensor data, communication patterns, caregiver input, artificial intelligence analysis, or other sources of information relevant to welfare status determination.

Information collected during the verification process may be used to progressively reduce uncertainty regarding the welfare status of the cared-for individual. In certain embodiments,

verification request 201 initiates collection of information 202 through one or more verification activities 203. The resulting information may be evaluated through confidence assessment 204 and welfare determination 205, with escalating intervention 206 invoked whenever confidence remains below a desired threshold.

Preferred Television-Based Embodiment

Referring now to Figure 4, caregiver device 401 may communicate with server platform 402 which delivers welfare verification information through television interface 403 to cared-for individual 404. Escalation timer 405, message repository 406, acknowledgement interfaces 407, logging system 408, and caregiver notification system 409 may support operation of the embodiment.

In a preferred embodiment, a television-based interaction system is utilized as a primary mechanism for communicating welfare verification requests to a cared-for individual.

A message may be displayed on a television screen associated with the cared-for individual. The message may be displayed as a ticker, banner, overlay, side panel, pop-up window, notification area, scrolling message, partial-screen display, full-screen display, or other visual presentation mechanism. In one embodiment, television interface 403 retrieves message content from message repository 406 and presents such content to cared-for individual 404 while acknowledgement interfaces 407 monitors SMS messages, for confirmation activity.

In one embodiment, lower-priority messages may be displayed as scrolling information appearing simultaneously with live television programming, recorded programming, streamed programming, gaming content, internet content, or other video content. Such messages may occupy a portion of the display while allowing the underlying content to remain visible.

Different visual characteristics may be utilized to indicate different urgency levels, welfare concerns, verification requirements, escalation states, or response expectations.

Such characteristics may include color, text size, font style, animation, flashing indicators, graphical symbols, icons, message prefixes, screen location, motion effects, borders, transparency levels, display duration, or combinations thereof.

For example, informational messages may utilize one set of visual indicators, reminder messages may utilize another set of visual indicators, confirmation-required messages may utilize additional indicators, and high-priority welfare verification requests may utilize yet another set of visual indicators.

As escalation progresses, the invention may increase visual prominence by enlarging text, changing colors, increasing animation effects, repositioning messages, increasing display frequency, increasing display duration, or ultimately replacing some or all displayed programming with welfare verification content.

In certain embodiments, the invention may temporarily suspend, interrupt, obscure, replace, pause, mute, reduce, or otherwise alter television programming in order to increase the likelihood that a welfare verification request will be observed.

Audio cues may also be utilized. Such cues may include tones, chimes, spoken messages, synthesized speech, recorded speech, music, alarms, sounds, verbal instructions, attention-getting audio signals, or combinations thereof.

The intensity, duration, frequency, repetition rate, or urgency of audio cues may increase as escalation progresses.

Confirmation and Response Mechanisms

The invention may utilize numerous confirmation mechanisms through which a cared-for individual may acknowledge, confirm, respond to, or otherwise address a welfare verification request.

In one embodiment, confirmation may be performed through a television remote control.

In another embodiment, confirmation may be performed through a smartphone application operating in a cared-for mode. A single interaction with a displayed confirmation control may indicate acknowledgement, terminate escalation activities, remove the welfare verification request from the television display, update caregiver records, and record a confirmation event.

In another embodiment, confirmation may be performed through an SMS response, telephone response, voice response, email response, internet response, mobile device response, or computer response.

In another embodiment, confirmation may be performed through a dedicated wireless confirmation device configured to communicate through cellular networks, Wi-Fi networks, Bluetooth networks, satellite networks, mesh networks, radio networks, wired networks, or combinations thereof.

Additional embodiments may utilize wearable devices, medical alert devices, smart watches, gesture recognition systems, cameras, voice recognition systems, QR code scanning systems, near-field communication systems, biometric systems, environmental sensors, occupancy sensors, motion sensors, pressure sensors, home automation systems, vehicle systems, appliance systems, or other mechanisms capable of providing information relevant to welfare verification.

Upon confirmation, the invention may terminate escalation activities, update welfare status records, generate caregiver notifications, remove displayed messages, record audit information, calculate response metrics, update historical behavior profiles, and perform other actions associated with successful welfare verification. Confirmation information received through acknowledgement interfaces 407 may be recorded by logging system 408 and communicated to

caregiver notification system 409, thereby permitting caregiver device 401 to receive near real-time status updates.

Logging and Audit Trail

The invention may maintain one or more audit logs configured to record activities associated with welfare verification.

Such records may include verification request creation, message delivery attempts, television display events, communication attempts, escalation transitions, caregiver notifications, confirmations, acknowledgements, response times, intervention actions, confidence measurements, welfare determinations, and related activities.

These records may provide evidence that verification attempts occurred, establish historical response patterns, support caregiver review, facilitate auditing, assist regulatory compliance, improve system operation, and provide input to artificial intelligence systems.

The resulting audit trail may constitute an important component of the welfare verification process by documenting the progressive efforts undertaken to determine welfare status.

Escalation States and Escalation Engine

In various embodiments, the invention utilizes one or more escalation states configured to progressively increase verification efforts, communication prominence, information gathering activities, intervention activities, and welfare assessment procedures. The escalation states are

intended to progressively reduce uncertainty regarding the welfare status of a cared-for individual when sufficient confidence regarding that individual's condition has not yet been achieved.

Unlike conventional messaging systems that merely deliver information, the present invention employs a progressive welfare verification methodology in which communication activities, confirmation activities, monitoring activities, and intervention activities may be adapted based upon responses, non-responses, observed conditions, confidence levels, historical behaviors, caregiver-defined policies, artificial intelligence recommendations, or other factors relevant to welfare status determination.

The invention may utilize an escalation engine configured to manage transitions between escalation states. The escalation engine may evaluate one or more factors including elapsed time, message priority, urgency level, response history, confirmation status, sensor information, behavioral indicators, confidence measurements, historical patterns, caregiver preferences, artificial intelligence recommendations, or combinations thereof. Based upon such evaluations, the escalation engine may determine whether additional verification activities should be performed, whether intervention should be increased, whether alternative communication channels should be utilized, or whether welfare status can be determined with sufficient confidence. As illustrated by Figures 7, 8, and 9, the escalation engine 104 may coordinate message presentation, escalation timers, intervention transitions, confirmation processing, and escalation termination activities throughout the welfare verification lifecycle.

In one preferred embodiment, the escalation process begins with an initial welfare verification state. During this state, a welfare verification request, reminder, notification, alert, instruction, inquiry, or other message may be presented to the cared-for individual using minimally intrusive communication methods. For example, a message may be displayed as a scrolling ticker, banner, overlay, side panel, notification area, or other display mechanism on a television screen while allowing normal viewing of live television programming, streaming content, recorded programming, gaming content, internet content, or other media. The objective of this initial state is to obtain acknowledgement or confirmation while minimizing disruption to the cared-for individual's normal activities. As shown in Figure 7, a verification event may be scheduled, prioritized, displayed, assigned an escalation level, and associated with one or more escalation timers before progressing to subsequent intervention states.

If confirmation is not received within a predetermined period of time, the invention may transition to one or more enhanced visual verification states. During such states, the invention may increase the prominence of displayed information by enlarging text, modifying colors, increasing animation, introducing flashing indicators, changing message position, displaying graphical symbols, presenting message prefixes, increasing display duration, increasing display frequency, or otherwise enhancing visibility. In certain embodiments, different visual characteristics may correspond to different message priorities, welfare concerns, escalation states, confidence levels, or intervention requirements.

Messages presented by the invention may include severity indicators intended to communicate the relative importance of the message. Such indicators may include textual prefixes, graphical icons, color coding, visual effects, audio cues, or combinations thereof. Examples may include informational messages, reminders, important notifications, confirmation-required messages, welfare verification requests, urgent notifications, emergency-related communications, or other classifications. Different message classifications may utilize different escalation policies, response expectations, timing intervals, and intervention procedures.

If confirmation remains absent, the invention may transition to one or more audio-assisted verification states. During such states, attention-getting audio signals may be utilized to increase the likelihood that the cared-for individual becomes aware of the welfare verification request. Such audio signals may include tones, chimes, alarms, recorded speech, synthesized speech, music, spoken instructions, verbal prompts, repeating announcements, or other audio mechanisms. In certain embodiments, audio prominence may progressively increase as escalation continues. Figure 8 illustrates representative escalation levels in which message prominence, message size, audio presentation, and communication modalities may be progressively increased.

In some embodiments, the invention may enter a full-screen verification state in which some or all existing television content is interrupted, obscured, replaced, paused, muted, reduced, suspended, or otherwise modified to increase attention toward the welfare verification request. During such a state, the television may become dedicated substantially or entirely to

presentation of welfare verification information. Visual and audio elements may be combined to maximize the likelihood of obtaining a response from the cared-for individual.

If sufficient confidence regarding welfare status is still not achieved, the invention may initiate one or more external communication escalation states. Such states may employ alternative communication channels including telephone calls, SMS messages, mobile application notifications, email messages, voice communications, audio announcement device, lighting control system, device notifications, smart speaker announcements, social messaging systems, internet messaging systems, home automation systems, or other communication mechanisms capable of reaching the cared-for individual through additional modalities.

The invention may continue escalating through progressively increasing levels of intervention. In one embodiment, one or more caregivers may be notified that welfare verification efforts have not produced sufficient confirmation. Such notifications may include details regarding prior communication attempts, escalation history, response history, confidence measurements, welfare assessments, message content, timestamps, and other information relevant to the caregiver's decision-making process.

If uncertainty regarding welfare status persists, the invention may initiate third-party intervention procedures. Such procedures may involve contacting family members, neighbors, volunteers, healthcare providers, assisted living personnel, monitoring services, social services,

emergency contacts, emergency responders, governmental agencies, or other entities capable of assisting in determining the welfare status of the cared-for individual.

The duration associated with each escalation state may be predetermined, dynamically determined, caregiver-configurable, context-dependent, or adaptively determined by artificial intelligence systems. For example, a routine reminder message may permit relatively long response intervals, whereas a medication confirmation request, post-surgical monitoring event, severe weather warning, welfare check request, or emergency notification may utilize shorter escalation intervals. Different cared-for individuals may utilize different escalation schedules based upon their unique needs, medical conditions, behavioral patterns, cognitive abilities, historical responsiveness, caregiver preferences, or other factors.

In certain embodiments, the invention may maintain one or more confidence measurements associated with welfare status determination. Such measurements may represent a confidence level, welfare score, responsiveness score, risk score, intervention score, uncertainty score, or other indicator reflecting the degree of confidence that the welfare status of the cared-for individual has been adequately determined. Information obtained from communication attempts, confirmations, behavioral observations, sensor information, historical patterns, environmental information, caregiver input, and artificial intelligence analysis may contribute to such measurements.

One significant aspect of the invention is that escalation is not performed solely to increase message visibility. Rather, escalation is performed as part of a progressive welfare verification process intended to obtain additional information and reduce uncertainty regarding welfare status. Each escalation state may provide additional opportunities to gather information, obtain responses, infer conditions, increase confidence, and determine whether further intervention is necessary.

The escalation process may terminate upon receipt of a confirmation, achievement of a predetermined confidence threshold, completion of a welfare determination, caregiver intervention, third-party intervention, expiration of escalation procedures, or satisfaction of one or more termination criteria. Upon termination, the invention may update welfare status records, record audit information, generate notifications, modify historical behavior profiles, update confidence measurements, and perform other actions associated with completion of the welfare verification process. As illustrated in Figure 9, receipt of a cared-for confirmation signal may cancel escalation timers, remove displayed welfare verification content, and record escalation results for future analysis before the process returns to a monitoring state.

Accordingly, the escalation engine serves as a central component of the invention by coordinating progressive verification activities, reducing uncertainty regarding welfare status, adapting intervention efforts based upon available information, and facilitating welfare status determination through escalating communication and verification procedures.

In various embodiments, the escalation process may employ one or more communication mechanisms, one or more alerting mechanisms, one or more verification mechanisms, or combinations thereof. Such mechanisms may include visual notifications, television displays, scrolling messages, overlays, banners, audio announcements, tones, alarms, telephone calls, text messages, electronic mail, mobile application notifications, wearable device notifications, smart-speaker interactions, home-automation actions, lighting controls, vibration devices, caregiver notifications, third-party notifications, or other mechanisms capable of obtaining information regarding the welfare status of a cared-for individual. The selection, sequence, timing, duration, intensity, and combination of such mechanisms may vary between escalation states and may be determined according to caregiver-defined policies, confidence measurements, uncertainty measurements, responsiveness measurements, welfare classifications, artificial intelligence recommendations, historical behavior patterns, or other escalation criteria.

Escalation State Definitions

In various embodiments, the invention may utilize a plurality of escalation states representing progressively increasing levels of verification activity, communication prominence, intervention effort, information gathering, caregiver involvement, or third-party participation. The number, sequence, duration, purpose, and characteristics of escalation states may vary among embodiments and are not limited to any particular implementation.

In one preferred embodiment, the escalation process may begin with an Initial Welfare Verification State. During this state, a welfare verification request is communicated to the cared-for individual using minimally intrusive methods intended to obtain confirmation while minimizing disruption to normal activities. Such communications may include prepending a confirmation request, using icons, using audio cues, reversing parts of text between the background and foreground color, via scrolling messages, informational displays, reminder notifications, visual indicators, or other unobtrusive presentation methods.

If sufficient confirmation is not obtained, the invention may transition to an Enhanced Visual Verification State. During this state, visual prominence may be increased through modifications to color, size, animation, display frequency, display duration, graphical indicators, message positioning, visual effects, or combinations thereof.

If confirmation remains absent, the invention may transition to an Audio-Assisted Verification State. Audio signals may be introduced or intensified to increase awareness of the welfare verification request. Such signals may include tones, alarms, recorded messages, synthesized speech, music, verbal instructions, or other attention-getting mechanisms.

In some embodiments, the invention may subsequently enter a Full-Screen Verification State in which television programming or other displayed content is partially or completely interrupted in order to prioritize welfare verification activities. During this state, visual and audio presentation methods may be combined to maximize the probability of obtaining a response.

If sufficient confidence regarding welfare status is still not achieved, the invention may enter an External Communication Escalation State. During this state, alternative communication channels may be utilized, including telephone calls, SMS messages, electronic mail, smartphone notifications, wearable device notifications, smart speaker interactions, internet messaging systems, or other communication mechanisms.

The invention may subsequently enter a Caregiver Escalation State in which one or more caregivers are informed that prior verification efforts have not achieved sufficient confidence regarding welfare status. Caregivers may be provided with information describing prior communication attempts, escalation history, confirmation history, confidence measurements, response patterns, and other relevant information.

In certain circumstances, the invention may enter a Third-Party Intervention State. During this state, one or more additional individuals or organizations may be contacted, including family members, neighbors, healthcare providers, monitoring services, assisted living personnel, emergency contacts, emergency responders, governmental agencies, or other entities capable of assisting in determining welfare status.

Although the foregoing example describes seven representative escalation states, the invention is not limited thereto. Any number of escalation states, escalation paths, escalation branches, escalation levels, adaptive escalation sequences, or dynamically generated escalation procedures may be utilized.

Escalation Timing and Transition Criteria

Transitions between escalation states may occur according to one or more escalation timing rules and transition criteria.

In some embodiments, escalation timing may be predetermined. In other embodiments, escalation timing may be configurable by a caregiver, healthcare provider, monitoring organization, administrator, artificial intelligence system, or other authorized entity.

Escalation timing may vary according to message type, message priority, urgency level, time of day, day of week, location, behavioral history, medical condition, cognitive condition, response history, environmental conditions, risk level, welfare confidence level, or other factors.

For example, a routine informational reminder may permit relatively long response intervals before escalation occurs. In contrast, medication reminders, post-surgical monitoring events, welfare checks, severe weather notifications, emergency instructions, or high-priority communications may utilize substantially shorter escalation intervals.

In certain embodiments, escalation timing may be adjusted dynamically. Historical response information associated with the cared-for individual may be evaluated to determine expected response patterns. Escalation timing may then be modified based upon observed behavior, allowing the invention to adapt to the unique characteristics of each individual.

Transitions between escalation states may be triggered by elapsed time, absence of confirmation, partial confirmation, confidence measurements, sensor information, behavioral

observations, caregiver intervention, artificial intelligence recommendations, environmental conditions, external events, or combinations thereof.

Welfare Confidence Assessment and Uncertainty Reduction

In one aspect of the invention, the escalation process may be driven by one or more welfare confidence assessments.

Rather than merely determining whether a message has been delivered, the invention seeks to determine the welfare status of a cared-for individual. Accordingly, the invention may maintain one or more confidence measurements representing the degree of certainty associated with a welfare determination.

Such measurements may be referred to as confidence scores, welfare scores, responsiveness scores, uncertainty scores, intervention scores, risk scores, welfare indicators, status indicators, or other measures capable of representing confidence regarding welfare status.

Confidence measurements may be influenced by a variety of information sources including confirmations, response times, communication activity, television activity, application activity, telephone activity, sensor information, wearable device information, environmental information, behavioral patterns, historical response history, caregiver observations, artificial intelligence analysis, and other information relevant to welfare assessment.

The invention may continuously evaluate available information and progressively reduce uncertainty regarding welfare status. As additional information is collected, confidence

measurements may increase or decrease. Escalation decisions may be based in whole or in part upon such measurements.

In some embodiments, escalation may continue until a predetermined confidence threshold has been achieved. In other embodiments, escalation may continue until confirmation is obtained, caregiver intervention occurs, welfare status is determined, third-party intervention occurs, or one or more termination criteria have been satisfied.

In certain embodiments, confidence assessment engine 103 continuously evaluates information obtained during the welfare verification process and generates one or more welfare confidence measurements, uncertainty measurements, risk assessments, responsiveness indicators, or welfare determination inputs. Confidence assessment engine 103 may evaluate direct confirmations, indirect confirmations, behavioral indicators, sensor information, historical response patterns, environmental information, and other welfare-related data in order to determine whether sufficient confidence regarding welfare status has been achieved.

A significant advantage of the invention is that welfare verification is not limited to determining whether a communication was delivered. Instead, the invention seeks to progressively gather information from multiple sources and utilize such information to increase confidence regarding the actual welfare status of the cared-for individual. Accordingly, the invention provides a systematic methodology for reducing uncertainty and determining welfare status through progressive verification and escalating intervention.

Responsiveness Determination

In various embodiments, the invention may evaluate one or more measures of responsiveness associated with a cared-for individual. Responsiveness may represent the ability, willingness, frequency, timeliness, consistency, or reliability with which an individual responds to welfare verification activities.

Responsiveness measurements may be derived from direct confirmations, indirect confirmations, response latency, communication activity, application activity, television activity, sensor information, historical behavior, caregiver observations, artificial intelligence analysis, or combinations thereof.

The invention may calculate one or more responsiveness indicators including response frequency, average response latency, maximum response latency, missed confirmation rates, escalation frequency, caregiver intervention frequency, time-of-day responsiveness, day-of-week responsiveness, seasonal responsiveness, and other metrics relevant to welfare determination.

In certain embodiments, responsiveness thresholds may be established. Failure to satisfy a responsiveness threshold may contribute to escalation decisions, welfare confidence calculations, welfare state determinations, caregiver notifications, intervention recommendations, or combinations thereof.

Historical responsiveness patterns may be maintained and compared against current behavior to identify changes, trends, deterioration, improvement, anomalies, or other conditions relevant to welfare assessment.

Accordingly, responsiveness determination may constitute an independent source of information utilized by the invention to evaluate welfare status and reduce uncertainty regarding the condition of the cared-for individual.

Welfare Status Determination

In various embodiments, the invention may classify the welfare status of a cared-for individual into one or more welfare categories.

Such categories may include a Normal State, Reduced Responsiveness State, Concern State, Elevated Concern State, Intervention Required State, Emergency State, or other classifications appropriate to a particular implementation.

A Normal State may indicate that sufficient information has been obtained to establish a high degree of confidence regarding welfare status.

A Reduced Responsiveness State may indicate delayed responses, reduced interaction levels, increased response latency, missed confirmations, or other indications that responsiveness differs from established behavioral patterns.

A Concern State may indicate that sufficient uncertainty exists to warrant increased monitoring, additional verification activities, escalation actions, caregiver involvement, or additional information gathering.

An Elevated Concern State may indicate increasing evidence suggesting potential welfare issues, increasing uncertainty, or failure of prior verification efforts.

An Intervention Required State may indicate that caregiver involvement, monitoring service involvement, or other intervention activities are recommended or required.

An Emergency State may indicate that available information suggests immediate welfare concerns requiring urgent action.

The invention may transition between welfare states based upon confirmations, responsiveness measurements, confidence measurements, sensor information, behavioral observations, environmental information, caregiver input, artificial intelligence analysis, or combinations thereof.

The welfare classifications described herein are intended to be illustrative and may be expanded, reduced, modified, subdivided, combined, or otherwise adapted without departing from the scope of the invention.

Caregiver-Controlled Escalation Policies

Referring now to Figure 5, escalation policy manager 501 may coordinate primary caregiver 502, secondary caregiver 503, family contacts 504, monitoring center 505, healthcare provider 506, and emergency contact 507 according to configured escalation policies.

In various embodiments, the invention permits one or more caregivers, administrators, healthcare providers, monitoring organizations, family members, artificial intelligence systems, or other authorized entities to establish, modify, manage, and control escalation policies associated with welfare verification activities.

Escalation policies may define the manner in which welfare verification requests are processed, communicated, monitored, evaluated, escalated, and resolved. Such policies may be established on a per-user basis, per-message basis, per-event basis, per-device basis, per-group basis, or according to other criteria.

In one embodiment, caregivers may configure one or more escalation states, escalation sequences, escalation timing intervals, communication methods, notification destinations, response requirements, intervention criteria, confidence thresholds, welfare thresholds, risk thresholds, escalation termination criteria, or combinations thereof.

Different categories of messages may utilize different escalation policies. For example, informational messages may utilize limited escalation activities, while medication reminders, appointment reminders, welfare verification requests, post-surgical monitoring activities, severe

weather alerts, emergency notifications, or healthcare-related communications may utilize more aggressive escalation procedures.

Caregivers may specify one or more preferred communication channels for both the cared-for individual and one or more caregivers. Such channels may include television-based interfaces, telephones, mobile devices, text messaging systems, electronic mail systems, wearable devices, smart speakers, internet messaging systems, social messaging systems, home automation systems, or other communication mechanisms.

In certain embodiments, caregivers may define one or more escalation contact lists specifying the order in which individuals or organizations should be contacted if welfare status remains uncertain. Such contact lists may include spouses, children, relatives, neighbors, healthcare providers, monitoring services, emergency contacts, assisted living personnel, emergency responders, governmental organizations, or other designated parties.

The invention may further permit caregivers to define escalation schedules that vary according to time of day, day of week, holidays, location, health status, medical condition, environmental conditions, behavioral patterns, activity schedules, travel schedules, or other factors.

Accordingly, escalation policies may be customized to the unique needs of each cared-for individual.

In certain embodiments, caregiver coordination may involve multiple caregivers organized according to one or more escalation hierarchies. For example, a primary caregiver, secondary caregiver, family member, healthcare provider, monitoring service, assisted-living staff member, or other authorized individual may be contacted according to predetermined escalation rules.

The invention may further support professional monitoring centers, healthcare organizations, home healthcare providers, senior living facilities, hospitals, rehabilitation facilities, government agencies, volunteer organizations, community support groups, or other entities responsible for welfare monitoring activities.

Escalation responsibilities may be transferred, shared, delegated, prioritized, or coordinated among multiple caregivers and organizations according to caregiver-defined policies, organizational policies, artificial intelligence recommendations, scheduling information, geographic proximity, availability status, or other criteria.

AI-Assisted Escalation and Welfare Determination

Referring now to Figure 6, historical behavior data 601, response history 602, sensor data 603, caregiver rules 604, and environmental data 605 may be evaluated by AI analysis engine 606 to

generate welfare confidence determinations 607, escalation recommendations 608, and welfare determination outputs 609.

In certain embodiments, the invention may utilize one or more artificial intelligence systems, machine learning systems, expert systems, predictive analytics systems, behavioral analysis systems, neural networks, statistical models, rule-based systems, or combinations thereof to assist in welfare verification and welfare status determination.

Artificial intelligence systems may analyze historical verification activities, response histories, confirmation histories, communication patterns, behavioral patterns, television viewing patterns, telephone activity, mobile device activity, sensor information, wearable device information, environmental information, caregiver observations, medical information, or other data relevant to welfare determination. Historical behavior data 601, response history 602, sensor data 603, caregiver rules 604, and environmental data 605 may be processed by AI analysis engine 606 to generate welfare confidence determinations 607, escalation recommendations 608, and welfare determination outputs 609.

The invention may utilize such information to identify patterns associated with normal behavior, expected responsiveness, routine activities, preferred communication channels, preferred response mechanisms, periods of inactivity, or other characteristics associated with the cared-for individual.

In one embodiment, artificial intelligence systems may dynamically modify escalation timing intervals based upon historical response behavior. For example, if a cared-for individual typically responds to welfare verification requests within ten minutes during daytime hours but requires substantially longer response periods during evening hours, the invention may automatically adjust escalation timing to reflect such observed behavior.

Artificial intelligence systems may further identify behavioral anomalies that may indicate increased welfare concerns. Examples may include unusual inactivity, unexpected communication patterns, missed confirmations, missed medication acknowledgements, changes in television viewing habits, unusual sensor activity, changes in response latency, or other deviations from established behavioral patterns.

The invention may further utilize artificial intelligence systems to calculate one or more welfare confidence scores, uncertainty measurements, risk assessments, escalation recommendations, intervention recommendations, caregiver notifications, or welfare status determinations.

Artificial intelligence systems may additionally recommend preferred communication methods based upon prior success rates. For example, the system may determine that one cared-for individual responds most reliably to television-based notifications while another individual responds more effectively to telephone calls, wearable notifications, or mobile application alerts.

Artificial intelligence engine 106 may operate independently or in conjunction with AI analysis engine 606 to identify behavioral trends, predict response probabilities, recommend escalation actions, estimate welfare confidence levels, identify anomalies, optimize communication pathways, and improve welfare determination accuracy over time. Artificial intelligence engine 106 may further utilize machine learning models trained using historical welfare verification data, escalation outcomes, caregiver interactions, confirmation histories, and behavioral observations.

Artificial intelligence systems may further perform predictive risk scoring, response probability prediction, adaptive communication channel selection, behavioral anomaly detection, personalized confidence threshold generation, learned escalation optimization, caregiver workload balancing, and intervention recommendation generation.

Accordingly, artificial intelligence may assist the invention in progressively reducing uncertainty, optimizing escalation activities, improving welfare determination accuracy, reducing unnecessary interventions, and increasing the likelihood of timely identification of welfare concerns.

Alternative Embodiments

Although a preferred embodiment of the invention utilizes television-based interaction, the invention is not limited to television-based systems.

In alternative embodiments, welfare verification requests may be presented through smartphones, tablet computers, personal computers, smart speakers, wearable devices, medical devices, home automation systems, vehicle information systems, augmented reality devices, virtual reality devices, robotics systems, kiosks, digital signage systems, public displays, appliances, network-connected devices, or other interaction mechanisms.

Similarly, confirmation activities may be performed using a wide variety of mechanisms including remote controls, mobile applications, telephones, text messages, email systems, voice commands, gesture recognition systems, biometric systems, QR code scanning systems, camera systems, wearable devices, smart watches, medical alert devices, occupancy sensors, motion sensors, pressure sensors, environmental sensors, location systems, home automation systems, vehicle systems, appliance systems, or future technologies capable of providing information relevant to welfare verification.

In certain embodiments, welfare verification may rely primarily upon direct confirmation from the cared-for individual. In other embodiments, welfare verification may rely primarily upon inferred behavior, environmental observations, sensor information, wearable information, or artificial intelligence analysis.

The invention may be implemented using cloud-based architectures, distributed computing architectures, edge computing systems, local computing devices, hybrid computing systems,

centralized monitoring systems, decentralized monitoring systems, peer-to-peer systems, or combinations thereof.

Additional embodiments may be employed by insurance organizations, governmental welfare agencies, veterans assistance programs, child welfare programs, lone-worker safety systems, traveler safety programs, educational institutions, and other organizations responsible for monitoring, verifying, or improving welfare status.

Accordingly, the embodiments described herein are intended to be illustrative rather than limiting.

Operational Examples

The following examples are provided solely to illustrate operation of the invention and are not intended to limit the scope of the invention.

Example 1 – Medication Compliance Verification

A caregiver schedules a medication reminder for a cared-for individual. At the scheduled time, the invention presents a welfare verification request through a television-based interface. If confirmation is received, the event is logged and the escalation process terminates. If confirmation is not received, escalation activities progressively increase until sufficient confidence regarding medication compliance and welfare status is achieved.

Example 2 – Daily Welfare Verification

A caregiver initiates a daily welfare verification request. The invention presents a message through a television interface requesting acknowledgement. If confirmation is received, welfare status records are updated. If confirmation is not received, escalating verification activities may include enhanced visual presentation, audio alerts, telephone calls, mobile notifications, caregiver notifications, and third-party intervention activities.

Example 3 – Dementia Care Monitoring

A cared-for individual experiencing cognitive decline receives scheduled reminders relating to medication, meals, appointments, hydration, or other activities. Escalation policies are configured to increase intervention levels more rapidly than would be utilized for a fully independent individual. Artificial intelligence systems may evaluate historical responsiveness and adjust escalation timing accordingly.

Example 4 – Post-Surgical Monitoring

A healthcare provider or caregiver schedules periodic welfare verification requests following a surgical procedure. The invention may require confirmation at predefined intervals. Failure to obtain confirmation may trigger escalating intervention activities intended to determine whether additional assistance is required.

Example 5 – Severe Weather Notification

The invention receives information regarding a severe weather event affecting the cared-for individual. A high-priority welfare verification request is presented. Escalation timing intervals

are shortened, communication prominence is increased, and alternative communication channels are utilized until sufficient confidence regarding welfare status and receipt of the warning has been achieved.

Advantages of the Invention

The invention provides numerous advantages over conventional communication systems, reminder systems, wellness monitoring systems, emergency notification systems, and escalation systems.

Unlike conventional messaging systems whose primary purpose is message delivery, the present invention seeks to determine welfare status through progressive verification activities designed to reduce uncertainty regarding the condition of a cared-for individual.

Unlike reminder systems that merely issue reminders, the invention evaluates whether sufficient evidence has been obtained to establish confidence regarding welfare status and may initiate escalating intervention activities when such confidence is not achieved.

Unlike many wellness monitoring systems that rely primarily upon passive sensing technologies, the invention may actively engage the cared-for individual through one or more communication modalities and confirmation mechanisms.

Unlike traditional escalation systems that follow fixed communication paths, the invention may utilize adaptive escalation procedures, caregiver-defined policies, confidence assessments, responsiveness analysis, historical behavior analysis, and artificial intelligence recommendations.

Unlike systems that merely deliver communications, the present invention employs progressive uncertainty reduction to determine welfare status through the accumulation and evaluation of information obtained from multiple verification mechanisms and communication modalities.

The invention further provides advantages through multi-modal verification, progressive intervention, auditable welfare determination records, caregiver coordination, adaptive escalation timing, machine-learning-assisted optimization, and welfare confidence assessment methodologies.

Accordingly, the invention provides a comprehensive framework for determining welfare status through progressive verification and escalating intervention while accommodating a wide variety of communication technologies, interaction mechanisms, caregiving environments, and future technological developments.

Multi-Modal Caregiver Notification and Engagement

While much of the invention is directed toward determining, estimating, predicting, verifying, classifying, monitoring, or otherwise assessing the welfare status of a cared-for individual, an equally important aspect of the invention is ensuring that welfare-related information, intervention requests, escalation notifications, emergency conditions, caregiver responsibilities, and other status information are reliably communicated to one or more caregivers.

In various embodiments, the invention may employ one or more caregiver communication mechanisms, one or more caregiver notification mechanisms, or combinations thereof to communicate welfare-related information to one or more caregivers. Such communication mechanisms may include telephone calls, text messages, electronic mail, mobile application notifications, push notifications, voice communications, video communications, smart-speaker notifications,

wearable-device notifications, monitoring-center notifications, home-automation notifications, messaging platforms, television-based notifications, or other communication mechanisms.

Figure 11 illustrates one embodiment of a Multi-Modal Caregiver Notification and Engagement Architecture. In the illustrated embodiment, a welfare event, welfare determination, escalation event, intervention request, confirmation failure, emergency condition, or other welfare-related condition may initiate caregiver notification activities. A Notification and Engagement Engine (1102) may select one or more communication mechanisms including, but not limited to, text messaging (1103), electronic mail (1104), voice communications (1105), mobile application notifications, wearable-device notifications, monitoring-center notifications, home-automation notifications, smart-speaker notifications, or other communication mechanisms. Such communication mechanisms may be utilized individually, simultaneously, sequentially, conditionally, adaptively, repeatedly, or according to one or more escalation policies.

The invention may monitor caregiver responses through a Caregiver Response Monitor (1106) to determine whether a caregiver has received, viewed,

acknowledged, accepted, delegated, rejected, ignored, or otherwise responded to a caregiver communication. When a desired caregiver response is obtained (1107), the invention may initiate, coordinate, track, or verify intervention activities (1109). When a desired caregiver response is not obtained (1108), the invention may perform repeated communication attempts, select alternative communication mechanisms (1110), escalate communications to additional caregivers (1111), monitoring organizations, healthcare providers, emergency contacts (1112), emergency services, or other entities capable of taking action.

In various embodiments, the communication mechanisms selected, communication sequence, communication timing, communication frequency, retry intervals, escalation pathways, caregiver selection, caregiver prioritization, and caregiver engagement strategies may be determined according to caregiver-defined policies, caregiver availability information, caregiver responsiveness information, confidence measurements, uncertainty measurements, welfare classifications, historical caregiver behavior, artificial intelligence recommendations, or other decision criteria. Accordingly, Figure 11 illustrates that reliable delivery of welfare-related information to one or more caregivers may

constitute an important invention objective that complements the determination of the welfare status of the cared-for individual.

The caregiver notification architecture illustrated in Figure 11 may itself constitute a progressive escalation architecture independent of welfare verification activities.

The invention may employ multi-modal caregiver communication strategies in which multiple communication mechanisms are utilized either simultaneously, sequentially, conditionally, repeatedly, adaptively, or according to one or more escalation policies. In some embodiments, communication attempts may continue through a first communication mechanism until a caregiver acknowledgement is obtained. In other embodiments, alternative communication mechanisms may be selected when prior communication attempts fail to obtain a caregiver acknowledgement, caregiver response, caregiver acceptance, caregiver engagement, or other caregiver action.

The invention may determine whether a caregiver has received, viewed, acknowledged, accepted, rejected, delegated, ignored, partially completed, or otherwise responded to a communication. Failure to obtain a desired caregiver response may result in repeated communication attempts, escalation to

alternative caregivers, escalation to additional caregivers, escalation to professional monitoring organizations, escalation to emergency contacts, escalation to emergency services, or initiation of other intervention activities.

Communication mechanism selection, communication timing, communication frequency, communication repetition, communication intensity, communication sequencing, escalation pathways, caregiver prioritization, caregiver selection, caregiver routing, caregiver delegation, and caregiver engagement strategies may be determined according to caregiver-defined policies, caregiver availability information, caregiver responsiveness information, historical caregiver behavior, confidence measurements, uncertainty measurements, welfare classifications, escalation states, artificial intelligence recommendations, time-of-day criteria, geographic information, or other decision criteria.

In various embodiments, the invention may optimize not only determination of the welfare status of the cared-for individual, but also successful delivery of welfare-related information to one or more caregivers capable of taking appropriate action. Accordingly, caregiver notification reliability, caregiver engagement reliability, caregiver acknowledgement reliability, and caregiver

intervention reliability may themselves be measured, monitored, optimized, and utilized as inputs to subsequent welfare-verification and escalation decisions.

In various embodiments, the invention may maintain detailed records associated with caregiver communication activities, caregiver notification activities, caregiver acknowledgement activities, caregiver response activities, caregiver acceptance activities, caregiver delegation activities, caregiver intervention activities, and other caregiver engagement activities. Such records may be maintained within the audit trail architecture and may include communication mechanisms utilized, communication timing, communication frequency, communication outcomes, acknowledgement timing, response timing, intervention timing, escalation pathways, caregiver actions, caregiver decisions, and other caregiver-related information.

The invention may determine caregiver communication effectiveness measurements, caregiver responsiveness measurements, caregiver engagement measurements, caregiver acknowledgement measurements, caregiver intervention measurements, caregiver notification reliability measurements, or other caregiver performance measurements. Such measurements may be

maintained for individual caregivers, groups of caregivers, organizations, monitoring centers, emergency contacts, healthcare providers, or other caregiver entities.

Artificial intelligence techniques, machine-learning techniques, predictive analytics techniques, statistical analysis techniques, behavioral analysis techniques, or combinations thereof may be utilized to analyze historical caregiver communication information and caregiver engagement information. Such analysis may be utilized to identify communication preferences, communication effectiveness patterns, caregiver responsiveness patterns, caregiver availability patterns, caregiver engagement patterns, escalation effectiveness patterns, intervention effectiveness patterns, or other caregiver-related behavioral characteristics.

Based upon such analysis, the invention may generate personalized caregiver communication strategies, personalized caregiver notification strategies, personalized caregiver escalation strategies, personalized caregiver routing strategies, personalized caregiver retry strategies, personalized caregiver engagement strategies, or other caregiver-specific communication procedures

intended to increase the probability of successfully notifying an appropriate caregiver within a desired time period.

The invention may further adapt communication mechanisms, communication sequencing, communication timing, communication frequency, communication intensity, escalation pathways, caregiver prioritization, caregiver selection, retry intervals, notification formats, or other caregiver engagement parameters based upon historical caregiver behavior and ongoing caregiver performance measurements. Accordingly, the invention may continuously optimize not only welfare determination activities but also caregiver notification effectiveness, caregiver engagement effectiveness, caregiver acknowledgement effectiveness, and caregiver intervention effectiveness.

In various embodiments, communication techniques, notification techniques, escalation techniques, verification techniques, confidence-assessment techniques, uncertainty-assessment techniques, responsiveness-determination techniques, artificial-intelligence techniques, communication-routing techniques, communication-optimization techniques, communication-effectiveness techniques, acknowledgement techniques, behavioral-analysis techniques,

historical-analysis techniques, retry techniques, prioritization techniques, and other communication-related techniques described herein with respect to communications directed toward a cared-for individual may likewise be applied, in whole or in part, to communications directed toward one or more caregivers.

Similarly, communication techniques, notification techniques, escalation techniques, routing techniques, optimization techniques, acknowledgement techniques, engagement techniques, behavioral-analysis techniques, artificial-intelligence techniques, historical-analysis techniques, and other communication-related techniques described herein with respect to communications directed toward one or more caregivers may likewise be applied, in whole or in part, to communications directed toward a cared-for individual.

Accordingly, unless explicitly stated otherwise, techniques described herein for communicating with, notifying, engaging, verifying, monitoring, escalating, prioritizing, routing, optimizing, or otherwise interacting with a cared-for individual may similarly be utilized for communicating with, notifying, engaging, verifying, monitoring, escalating, prioritizing, routing, optimizing, or otherwise interacting with one or more caregivers, and vice versa.

Concluding Remarks

While the invention has been described with reference to certain preferred embodiments, including television-based welfare verification systems, progressive intervention systems, caregiver coordination systems, artificial intelligence-assisted welfare determination systems, and other illustrative implementations, those skilled in the art will recognize that numerous modifications, variations, substitutions, combinations, and alternative implementations may be made without departing from the spirit and scope of the invention.

The embodiments described herein are intended to illustrate principles of progressive welfare verification, welfare status determination, responsiveness assessment, uncertainty reduction, escalating intervention, multi-modal communication, caregiver coordination, confirmation processing, and related methodologies. The invention is not limited to any particular communication technology, display technology, verification mechanism, acknowledgement mechanism, escalation methodology, artificial intelligence implementation, network architecture, hardware platform, software platform, database structure, user interface, or system configuration.

Although certain embodiments utilize television-based interaction as a preferred mechanism for communicating with a cared-for individual, the invention may be implemented using any present or future communication modality, verification modality, interaction mechanism,

sensing technology, computing platform, network technology, monitoring technology, or combination thereof capable of supporting welfare verification and escalating intervention activities.

Similarly, although specific examples of escalation states, welfare classifications, responsiveness metrics, confidence measurements, communication pathways, intervention procedures, caregiver structures, and artificial intelligence techniques have been described, such examples are intended to be illustrative rather than limiting. Additional states, classifications, metrics, thresholds, communication methods, intervention mechanisms, verification techniques, analytical models, and operational procedures may be employed without departing from the scope of the invention.

Accordingly, the scope of the invention should not be limited by the particular embodiments disclosed herein, but rather should be interpreted in view of the full breadth and spirit of the inventive concepts described throughout this specification and any claims that may ultimately be presented.

=====

6. REFERENCES

Information cited in the following reference material, and others, have been used in support of the claims and statements made in this application.

1. **World Health Organization — Ageing and Health.** WHO reports that by 2030, 1 in 6 people worldwide will be age 60 or older, and that the population age 60+ is expected to double to 2.1 billion by 2050. ([World Health Organization](#))
2. **United Nations Population Fund — Ageing.** UNFPA states that the global share of people age 65+ nearly doubled from 1974 to 2024 and is projected to double again by 2074. ([United Nations Population Fund](#))
3. **Administration for Community Living — 2023 Profile of Older Americans.** ACL reported that people age 65+ represented 17.3% of the U.S. population in 2022 and are expected to reach 22% by 2040. ([ACL](#))
4. **ACL — Older Adults Living Alone.** The ACL profile states that about 28%, or 16.2 million, older adults living in the community lived alone in 2023. ([ACL](#))
5. **AARP — 2024 Home and Community Preferences Survey.** AARP found that 75% of Americans age 50+ want to remain in their current home and 73% want to remain in their community as long as possible. ([AARP](#))
6. **CDC — Dementia Caregiving as a Public Health Strategy.** CDC reports that about 1 in 5 adults are caregivers and that unpaid caregiving represents hundreds of billions of dollars in annual value. ([CDC](#))
7. **Alzheimer’s Association — 2025 Alzheimer’s Disease Facts and Figures.** The report states that nearly 12 million Americans provided unpaid care to people living with

dementia in 2024, totaling more than 19 billion hours of care valued at about \$413 billion. ([Alzheimer's Association](#))

8. **Alzheimer's Association — Alzheimer's and Dementia Caregiver Burden.** The association notes that nearly 13 million Americans provide unpaid care for a family member or friend with dementia. ([Alzheimer's Association](#))
9. **Alzheimer's Association / NIH PMC — 2025 Facts and Figures.** An estimated 7.2 million Americans age 65+ are living with Alzheimer's dementia, with projected growth in coming decades. ([Alzheimer's & Dementia](#))
10. **TV-Messenger.com — Dementia & Alzheimer's.** TV Messenger's dementia page notes that many caregivers spend substantial time reminding loved ones about medications, appointments, and other daily needs. ([TV Messenger](#))
11. **JMIR — In-Home Monitoring Technology for Aging in Place.** This review describes in-home monitoring technologies as important tools for supporting aging in place and identifying health-related issues. ([IJMR](#))
12. **JMIR Aging — In-Home Positioning for Remote Home Health Monitoring.** This article describes remote home monitoring technologies used to support older adults aging in place and detect physical or cognitive decline. ([JMIR Aging](#))
13. **AARP — Medical Alert Systems.** AARP describes medical alert systems and automatic fall detection, useful as prior-art context for emergency-response systems. ([AARP](#))

14. **National Council on Aging — Medical Alert Features.** NCOA summarizes common medical alert features such as emergency buttons, two-way communication, and 24/7 monitoring. ([National Council on Aging](#))

15. **China Elder Care / Filial Support Law.** China’s 2013 elder-care law is widely described as requiring adult children to provide mental and financial support or maintain contact with elderly parents, showing the social and legal importance of elder care obligations. ([PMC](#))

=====

7. CLAIMS

1. A system for determining a welfare status of an individual, comprising:
one or more processors;
one or more communication interfaces; and
memory storing instructions which, when executed by the one or more processors, cause the system to:
 - (a) initiate a welfare verification activity associated with the individual;
 - (b) acquire welfare-related information through one or more verification stages;
 - (c) evaluate the acquired welfare-related information;
 - (d) progressively reduce uncertainty regarding the welfare status of the individual based upon the acquired welfare-related information;
 - (e) determine a welfare status of the individual based upon the acquired welfare-related information; and
 - (f) initiate an additional verification activity or an intervention activity when a confidence level associated with the determined welfare status fails to satisfy a threshold condition.
2. A system for escalating welfare-related interventions, comprising:

one or more processors; and

memory storing instructions which, when executed by the one or more processors, cause the system to:

- (a) establish a plurality of escalation states;
- (b) determine transitions between the plurality of escalation states;
- (c) initiate intervention activities associated with respective escalation states;
- (d) modify escalation activities according to one or more of responsiveness measurements, confidence measurements, welfare classifications, historical behavior information, caregiver-defined policies, or verification outcomes; and
- (e) suspend, restart, terminate, rollback, or complete an escalation process according to one or more escalation criteria.

3. A system for welfare verification utilizing a television interface, comprising:

a television display interface;

one or more processors; and

memory storing instructions which, when executed by the one or more processors, cause the system to:

- (a) present welfare verification information on a television display;
- (b) receive acknowledgement information through one or more acknowledgement mechanisms;
- (c) modify presentation of the welfare verification information according to an acknowledgement status;
- (d) initiate or interact with an escalation process when acknowledgement information is not received; and
- (e) utilize the acknowledgement information to determine or assist in determining a welfare status of an individual.

4. A system for multi-modal welfare verification, comprising:

one or more processors;

a plurality of communication, sensing, verification, or interaction interfaces; and
memory storing instructions which, when executed by the one or more processors, cause the system to:

- (a) select one or more verification modalities for obtaining welfare-related information associated with an individual;
- (b) communicate with, receive information from, or monitor the individual through the selected one or more verification modalities;
- (c) coordinate information obtained from a plurality of verification modalities;
- (d) determine a welfare status of the individual based at least in part upon information obtained through the plurality of verification modalities; and
- (e) adapt selection, sequencing, or use of the verification modalities based upon information obtained during a welfare verification process.

5. A system for welfare confidence assessment, comprising:

one or more processors;

one or more information sources configured to provide welfare-related information associated with an individual; and

memory storing instructions which, when executed by the one or more processors, cause the system to:

- (a) receive welfare-related information from the one or more information sources;
- (b) generate one or more confidence measurements associated with a welfare determination;
- (c) evaluate the one or more confidence measurements against one or more confidence criteria;
- (d) modify, update, or reassess the one or more confidence measurements based upon subsequently received welfare-related information; and
- (e) utilize the one or more confidence measurements to guide verification activity, escalation activity, intervention activity, or welfare status determination.

6. A system for progressive reduction of uncertainty regarding welfare status, comprising:

one or more processors;

one or more information acquisition interfaces; and

memory storing instructions which, when executed by the one or more processors, cause the system to:

- (a) determine an uncertainty condition associated with a welfare status of an individual;
- (b) acquire information from one or more information sources relevant to the uncertainty condition;
- (c) evaluate, weight, or combine the acquired information;
- (d) update an uncertainty measurement associated with the welfare status of the individual;
- (e) repeat information acquisition or evaluation until the uncertainty measurement satisfies one or more uncertainty criteria or intervention criteria; and
- (f) determine a welfare status or initiate an intervention activity based at least in part upon the uncertainty measurement.

7. A system for determining responsiveness of an individual, comprising:

one or more processors;

one or more information acquisition interfaces; and

memory storing instructions which, when executed by the one or more processors, cause the system to:

- (a) obtain responsiveness-related information associated with the individual;
- (b) determine one or more responsiveness measurements associated with the individual;
- (c) analyze historical responsiveness information associated with the individual;
- (d) establish one or more responsiveness baselines;
- (e) identify responsiveness trends, deviations, anomalies, or predicted responsiveness conditions; and
- (f) utilize the one or more responsiveness measurements to influence welfare determinations, verification activities, intervention activities, or escalation activities.

8. A system for classifying welfare status of an individual, comprising:

one or more processors; and

memory storing instructions which, when executed by the one or more processors, cause the system to:

- (a) receive information associated with the individual;
- (b) assign the individual to one or more welfare states based upon the received information;
- (c) determine transitions between welfare states;
- (d) maintain a welfare-state history associated with the individual;
- (e) determine state persistence, recovery, escalation, or change conditions; and
- (f) utilize the assigned welfare state to guide verification activities, escalation activities, intervention activities, or caregiver actions.

9. A system for determining welfare status utilizing artificial intelligence, comprising:

one or more processors;

one or more data sources; and

memory storing instructions which, when executed by the one or more processors, cause the system to:

- (a) obtain welfare-related information associated with an individual;
- (b) apply one or more artificial intelligence, machine-learning, predictive analytics, behavioral modeling, anomaly detection, or risk-scoring techniques to the welfare-related information;
- (c) generate one or more welfare-related assessments, predictions, recommendations, or determinations;
- (d) adapt the one or more assessments, predictions, recommendations, or determinations based upon subsequently obtained information; and
- (e) utilize the one or more assessments, predictions, recommendations, or determinations to influence welfare verification, welfare classification, intervention activities, or escalation activities.

10. A system for optimizing escalation activities utilizing artificial intelligence, comprising:

one or more processors; and

memory storing instructions which, when executed by the one or more processors, cause the system to:

- (a) evaluate information associated with an escalation process;
- (b) apply one or more artificial intelligence, machine-learning, predictive modeling, reinforcement learning, or optimization techniques;
- (c) determine one or more escalation timing recommendations, escalation pathway recommendations, communication recommendations, intervention recommendations, or escalation outcome predictions;
- (d) modify escalation activities according to the recommendations or predictions; and
- (e) improve future escalation activities based upon historical escalation outcomes.

11. A system for coordinating welfare-related activities among a plurality of responsible parties, comprising:

one or more processors; and

memory storing instructions which, when executed by the one or more processors, cause the system to:

- (a) identify a plurality of caregivers, monitoring organizations, healthcare providers, emergency contacts, or other responsible parties associated with an individual;
- (b) assign or transfer responsibility among the plurality of responsible parties;
- (c) route welfare-related information, notifications, interventions, or escalation activities among the plurality of responsible parties;
- (d) coordinate responses from the plurality of responsible parties; and
- (e) manage escalation reassignment, responsibility reassignment, or coordinated intervention activities.

12. A system for maintaining an audit trail associated with welfare-related activities, comprising:

one or more processors;

one or more data storage devices; and

memory storing instructions which, when executed by the one or more processors, cause the system to:

(a) record welfare verification activities, escalation activities, confirmation events, welfare determinations, caregiver activities, or intervention outcomes;

(b) maintain a chronological record of the recorded activities and events;

(c) retrieve and analyze the chronological record;

(d) generate accountability, compliance, reporting, historical, or analytical information from the chronological record; and

(e) utilize the chronological record to support future welfare-related determinations, interventions, audits, investigations, or decision-making activities.

13. The system of claim 1, wherein the welfare verification activity is initiated according to a scheduled verification schedule.

14. The system of claim 1, wherein the welfare verification activity is initiated in response to a triggering event.

15. The system of claim 1, wherein the welfare verification activity is initiated periodically.

16. The system of claim 1, wherein the welfare verification activity is initiated according to one or more caregiver-defined verification policies.

17. The system of claim 1, wherein the welfare-related information includes historical behavior information associated with the individual.

18. The system of claim 1, wherein the system performs one or more verification retries when sufficient welfare-related information has not been obtained.

19. The system of claim 1, wherein the welfare verification activity is abandoned when one or more abandonment criteria are satisfied.

20. The system of claim 1, wherein the welfare verification activity is assigned a verification priority level.

21. The system of claim 1, wherein the welfare verification activity is associated with an expiration criterion.
22. The system of claim 1, wherein the welfare verification activity may be cancelled according to one or more cancellation criteria.
23. The system of claim 1, wherein the welfare verification activity may be rescheduled according to one or more rescheduling criteria.
24. The system of claim 1, wherein the welfare verification activity is associated with a recurring verification schedule.
25. The system of claim 1, wherein initiation of the intervention activity is based upon one or more verification escalation thresholds.
26. The system of claim 1, wherein the confidence level is evaluated against one or more verification confidence thresholds.
27. The system of claim 1, wherein completion of the welfare verification activity requires satisfaction of one or more verification completion confidence levels.
28. The system of claim 1, wherein the system generates a verification outcome score associated with the welfare verification activity.
29. The system of claim 1, wherein the system manages a lifecycle of the welfare verification activity from initiation through completion.
30. The system of claim 1, wherein the welfare verification activity is coordinated among a plurality of systems.
31. The system of claim 1, wherein the welfare verification activity comprises presenting verification information on a television display.
32. The system of claim 31, wherein the verification information is presented as a television ticker.
33. The system of claim 31, wherein the verification information is presented as a television overlay.
34. The system of claim 31, wherein the verification information is presented in a full-screen television presentation.

35. The system of claim 1, wherein determination of the welfare status includes progressively reducing uncertainty regarding the welfare status through multiple verification stages.
36. The system of claim 1, wherein the welfare verification activity utilizes information obtained from a plurality of verification modalities.
37. The system of claim 1, wherein additional verification activities are selected based upon information acquired during preceding verification stages.
38. The system of claim 2, wherein the escalation process utilizes one or more escalation timers.
39. The system of claim 2, wherein the plurality of escalation states comprise a plurality of escalation levels.
40. The system of claim 2, wherein transitions between escalation states are determined according to predefined escalation transition criteria.
41. The system of claim 2, wherein an escalation activity comprises a visual intervention.
42. The system of claim 2, wherein an escalation activity comprises an audio intervention.
43. The system of claim 2, wherein an escalation activity comprises a communication intervention.
44. The system of claim 2, wherein an escalation activity comprises notifying a caregiver.
45. The system of claim 2, wherein an escalation activity comprises notifying a third party.
46. The system of claim 2, wherein an escalation activity comprises initiating an emergency notification.
47. The system of claim 2, wherein escalation activities are selected according to one or more caregiver-defined policies.
48. The system of claim 2, wherein escalation activities are selected according to one or more confidence measurements.

49. The system of claim 2, wherein escalation activities are selected according to one or more responsiveness measurements.
50. The system of claim 2, wherein escalation activities are selected according to one or more welfare classifications.
51. The system of claim 2, wherein escalation activities are selected according to one or more uncertainty measurements.
52. The system of claim 2, wherein escalation activities are selected according to a message severity level.
53. The system of claim 2, wherein escalation timing is selected by a caregiver.
54. The system of claim 2, wherein an escalation pathway is selected by a caregiver.
55. The system of claim 2, wherein the escalation process may be paused.
56. The system of claim 2, wherein the escalation process may be resumed following a pause condition.
57. The system of claim 2, wherein the escalation process is terminated according to one or more termination criteria.
58. The system of claim 2, wherein an escalation pathway is selected from a plurality of escalation pathways.
59. The system of claim 2, wherein intervention activities are prioritized according to one or more intervention prioritization criteria.
60. The system of claim 2, wherein an escalation activity comprises interruption of television programming.
61. The system of claim 60, wherein the interruption comprises replacement of television programming with welfare-related information.
62. The system of claim 60, wherein the interruption comprises insertion of welfare-related audio into television programming.
63. The system of claim 2, wherein escalation activities progressively increase in intensity as escalation states advance.
64. The system of claim 2, wherein advancement between escalation states is based upon failure to obtain a required acknowledgement.

65. The system of claim 2, wherein advancement between escalation states is based upon expiration of an escalation timer.
66. The system of claim 3, wherein the welfare verification information is presented as a scrolling ticker on the television display.
67. The system of claim 3, wherein the welfare verification information is presented as a television overlay.
68. The system of claim 3, wherein the welfare verification information is presented as a banner on the television display.
69. The system of claim 3, wherein the welfare verification information is presented as a pop-up message on the television display.
70. The system of claim 3, wherein the welfare verification information is presented within a side panel on the television display.
71. The system of claim 3, wherein the welfare verification information is presented as a full-screen display.
72. The system of claim 3, wherein presentation of the welfare verification information interrupts television programming.
73. The system of claim 72, wherein the interrupted television programming is replaced with welfare verification information.
74. The system of claim 3, wherein welfare verification information is accompanied by an audio presentation.
75. The system of claim 74, wherein the audio presentation replaces audio associated with television programming.
76. The system of claim 3, wherein presentation characteristics of the welfare verification information are selected according to a severity level.
77. The system of claim 76, wherein the presentation characteristics comprise color prioritization.

78. The system of claim 76, wherein the presentation characteristics comprise text-size prioritization.
79. The system of claim 76, wherein the presentation characteristics comprise one or more priority indicators.
80. The system of claim 76, wherein the presentation characteristics comprise one or more severity indicators.
81. The system of claim 3, wherein the welfare verification information remains displayed according to a message persistence timer.
82. The system of claim 3, wherein presentation of the welfare verification information is controlled according to caregiver-defined display policies.
83. The system of claim 3, wherein acknowledgement information is received through a wireless button.
84. The system of claim 3, wherein acknowledgement information is received through a mobile application.
85. The system of claim 3, wherein acknowledgement information is received through a text messaging service.
86. The system of claim 3, wherein acknowledgement information is received through a telephone communication.
87. The system of claim 3, wherein acknowledgement information is received through a television remote control.
88. The system of claim 3, wherein acknowledgement information is received through a voice interface.
89. The system of claim 3, wherein television content is paused while the welfare verification information is displayed.
90. The system of claim 3, wherein television content is muted while the welfare verification information is displayed.
91. The system of claim 3, wherein a television channel is automatically changed in response to a welfare verification event.

92. The system of claim 3, wherein streaming content is interrupted to present welfare verification information.
93. The system of claim 92, wherein the interrupted streaming content is replaced with welfare verification information.
94. The system of claim 3, wherein a display format is dynamically selected according to message severity.
95. The system of claim 3, wherein an audio presentation format is dynamically selected according to message severity.
96. The system of claim 3, wherein message persistence is dynamically adjusted according to message severity.
97. The system of claim 3, wherein interaction with the welfare verification information is performed through navigation of a television remote control.
98. The system of claim 3, wherein interaction with the welfare verification information is performed through a voice interface.
99. The system of claim 3, wherein interaction with the welfare verification information is performed through a companion mobile application.
100. The system of claim 3, wherein the television display serves as a primary welfare-verification interface for the individual.
101. The system of claim 4, wherein the plurality of verification modalities comprise a television modality.
102. The system of claim 4, wherein the plurality of verification modalities comprise a telephone modality.
103. The system of claim 4, wherein the plurality of verification modalities comprise a text messaging modality.
104. The system of claim 4, wherein the plurality of verification modalities comprise an electronic mail modality.

105. The system of claim 4, wherein the plurality of verification modalities comprise a mobile application modality.
106. The system of claim 4, wherein the plurality of verification modalities comprise a voice communication modality.
107. The system of claim 4, wherein the plurality of verification modalities comprise a video communication modality.
108. The system of claim 4, wherein the plurality of verification modalities comprise a wearable-device modality.
109. The system of claim 4, wherein the plurality of verification modalities comprise a sensor modality.
110. The system of claim 4, wherein the plurality of verification modalities comprise a QR-code modality.
111. The system of claim 4, wherein the plurality of verification modalities comprise a biometric modality.
112. The system of claim 4, wherein the plurality of verification modalities comprise a camera modality.
113. The system of claim 4, wherein the plurality of verification modalities comprise a smart-speaker modality.
114. The system of claim 4, wherein the plurality of verification modalities are utilized simultaneously.
115. The system of claim 4, wherein the plurality of verification modalities are utilized sequentially.
116. The system of claim 4, wherein selection of the plurality of verification modalities is adaptive.
117. The system of claim 4, wherein the plurality of verification modalities are prioritized according to modality prioritization criteria.

118. The system of claim 4, wherein respective verification modalities are weighted according to confidence measurements.
119. The system of claim 4, wherein one verification modality may be substituted for another verification modality.
120. The system of claim 4, wherein failure of a first verification modality causes selection of a fallback verification modality.
121. The system of claim 4, wherein selection of verification modalities is optimized according to historical effectiveness.
122. The system of claim 4, wherein availability of verification modalities is determined prior to modality selection.
123. The system of claim 4, wherein effectiveness scores are maintained for respective verification modalities.
124. The system of claim 4, wherein a plurality of devices participate in coordinated utilization of the verification modalities.
125. The system of claim 4, wherein one of the plurality of verification modalities comprises a television interface utilized to obtain welfare-related information.
126. The system of claim 5, wherein the one or more confidence measurements comprise confidence scores.
127. The system of claim 5, wherein the one or more confidence measurements are generated using weighted welfare-related information.
128. The system of claim 5, wherein the one or more confidence criteria comprise confidence thresholds.
129. The system of claim 5, wherein the one or more confidence measurements are modified according to confidence decay criteria.
130. The system of claim 5, wherein the one or more confidence measurements increase in response to receipt of additional welfare-related information.

131. The system of claim 5, wherein historical confidence measurements are maintained.
132. The system of claim 5, wherein confidence persistence measurements are maintained.
133. The system of claim 5, wherein trends associated with the one or more confidence measurements are analyzed.
134. The system of claim 5, wherein confidence measurements associated with direct verification activities are weighted differently than confidence measurements associated with indirect verification activities.
135. The system of claim 5, wherein confidence measurements associated with sensor information are weighted according to sensor characteristics.
136. The system of claim 5, wherein confidence measurements associated with caregiver-provided information are weighted according to caregiver-related criteria.
137. The system of claim 5, wherein the one or more confidence measurements are recalculated in response to receipt of additional welfare-related information.
138. The system of claim 5, wherein the one or more confidence measurements are generated using artificial intelligence techniques.
139. The system of claim 5, wherein one or more confidence measurements are refreshed in response to a confidence refresh event.
140. The system of claim 5, wherein one or more confidence measurements are inherited from a prior welfare verification activity.
141. The system of claim 5, wherein one or more confidence measurements are generated using information obtained through a plurality of verification modalities.
142. The system of claim 5, wherein one or more confidence trend thresholds are utilized to influence welfare-related decisions.
143. The system of claim 5, wherein changes in confidence measurements are monitored over time.

144. The system of claim 5, wherein acceleration or deceleration of confidence measurements is determined.
145. The system of claim 5, wherein selection of a verification modality is based at least in part upon one or more confidence measurements.
146. The system of claim 5, wherein caregiver notification is initiated based at least in part upon one or more confidence measurements.
147. The system of claim 5, wherein intervention activity is initiated based at least in part upon one or more confidence measurements.
148. The system of claim 5, wherein at least one confidence measurement is generated from acknowledgement information received through a television interface.
149. The system of claim 6, wherein an uncertainty history is maintained for the individual.
150. The system of claim 6, wherein trends associated with uncertainty measurements are analyzed.
151. The system of claim 6, wherein uncertainty decay measurements are determined.
152. The system of claim 6, wherein uncertainty thresholds are associated with respective welfare states.
153. The system of claim 6, wherein a change in uncertainty measurement causes selection of a different verification modality.
154. The system of claim 6, wherein an uncertainty condition triggers caregiver notification.
155. The system of claim 6, wherein an uncertainty condition triggers an escalation activity.
156. The system of claim 6, wherein selection of a verification activity is based at least in part upon an uncertainty measurement.
157. The system of claim 6, wherein selection of an intervention activity is based at least in part upon an uncertainty measurement.
158. The system of claim 6, wherein information from a plurality of information sources is combined to reduce uncertainty.
159. The system of claim 6, wherein acquired information is weighted according to source reliability.

160. The system of claim 6, wherein uncertainty measurements are updated after each verification stage.
161. The system of claim 6, wherein uncertainty measurements are maintained as numerical scores.
162. The system of claim 6, wherein uncertainty measurements are maintained as categorical uncertainty levels.
163. The system of claim 6, wherein reduction of uncertainty is utilized to determine whether an escalation activity should be initiated.
164. The system of claim 6, wherein reduction of uncertainty is utilized to determine whether a welfare verification activity should continue.
165. The system of claim 6, wherein uncertainty measurements are generated using artificial intelligence techniques.
166. The system of claim 6, wherein uncertainty is reduced through acknowledgement information received from a television interface.
167. The system of claim 6, wherein uncertainty measurements are utilized to prioritize verification activities.
168. The system of claim 6, wherein uncertainty measurements are utilized to prioritize intervention activities.
169. The system of claim 7, wherein responsiveness measurements are assigned to one or more responsiveness categories.
170. The system of claim 7, wherein responsiveness measurements are evaluated against one or more responsiveness thresholds.
171. The system of claim 7, wherein confidence measurements are associated with responsiveness determinations.
172. The system of claim 7, wherein responsiveness recovery rates are determined.
173. The system of claim 7, wherein responsiveness deterioration rates are determined.
174. The system of claim 7, wherein personalized responsiveness baselines are established for the individual.
175. The system of claim 7, wherein responsiveness prediction confidence values are generated.

176. The system of claim 7, wherein welfare classifications are determined at least in part from responsiveness measurements.
177. The system of claim 7, wherein response latency is measured.
178. The system of claim 7, wherein historical response latency is maintained.
179. The system of claim 7, wherein responsiveness is evaluated according to time-of-day criteria.
180. The system of claim 7, wherein responsiveness is evaluated according to day-of-week criteria.
181. The system of claim 7, wherein failure-to-respond measurements are maintained.
182. The system of claim 7, wherein responsiveness scores are generated.
183. The system of claim 7, wherein trends associated with responsiveness measurements are analyzed.
184. The system of claim 7, wherein responsiveness anomalies are detected.
185. The system of claim 7, wherein future responsiveness conditions are predicted.
186. The system of claim 7, wherein responsiveness measurements influence escalation activities.
187. The system of claim 7, wherein responsiveness measurements influence welfare determinations.
188. The system of claim 7, wherein responsiveness measurements are determined from acknowledgement information received through a television interface.
189. The system of claim 8, wherein transitions between welfare states are determined according to one or more state transition thresholds.
190. The system of claim 8, wherein transitions between welfare states are determined according to state transition timing criteria.
191. The system of claim 8, wherein persistence of a welfare state is measured.
192. The system of claim 8, wherein one or more confidence levels are associated with respective welfare states.
193. The system of claim 8, wherein future welfare states are predicted.
194. The system of claim 8, wherein recovery from a welfare state is predicted.

195. The system of claim 8, wherein escalation activities are selected according to a current welfare state.
196. The system of claim 8, wherein caregiver notification policies are selected according to a current welfare state.
197. The system of claim 8, wherein a first welfare state corresponds to normal operation.
198. The system of claim 8, wherein a second welfare state corresponds to reduced responsiveness.
199. The system of claim 8, wherein a third welfare state corresponds to elevated concern.
200. The system of claim 8, wherein a fourth welfare state corresponds to intervention required.
201. The system of claim 8, wherein a fifth welfare state corresponds to an emergency condition.
202. The system of claim 8, wherein welfare state histories are maintained.
203. The system of claim 8, wherein welfare states are determined at least in part from responsiveness measurements.
204. The system of claim 8, wherein welfare states are determined at least in part from confidence measurements.
205. The system of claim 8, wherein welfare states are determined at least in part from uncertainty measurements.
206. The system of claim 8, wherein welfare states influence selection of verification modalities.
207. The system of claim 8, wherein welfare states influence escalation timing.
208. The system of claim 8, wherein welfare states are determined at least in part from acknowledgement information received through a television interface.
209. The system of claim 9, wherein personalized behavioral baselines are established for the individual.
210. The system of claim 9, wherein adaptive response thresholds are utilized.
211. The system of claim 9, wherein anomaly confidence scores are generated.

- 212. The system of claim 9, wherein welfare prediction confidence scores are generated.
- 213. The system of claim 9, wherein machine-learning models are adapted according to newly acquired information.
- 214. The system of claim 9, wherein federated learning techniques are utilized.
- 215. The system of claim 9, wherein artificial intelligence determinations are combined with rule-based determinations.
- 216. The system of claim 9, wherein artificial intelligence techniques are utilized to select verification activities.
- 217. The system of claim 9, wherein behavioral anomalies are identified.
- 218. The system of claim 9, wherein historical behavior information is utilized to determine welfare status.
- 219. The system of claim 9, wherein risk scores are generated.
- 220. The system of claim 9, wherein predictive analytics are utilized to forecast welfare conditions.
- 221. The system of claim 9, wherein artificial intelligence techniques determine personalized welfare profiles.
- 222. The system of claim 9, wherein artificial intelligence techniques identify deviations from personalized welfare profiles.
- 223. The system of claim 9, wherein artificial intelligence techniques influence escalation decisions.
- 224. The system of claim 9, wherein artificial intelligence techniques influence intervention decisions.
- 225. The system of claim 9, wherein artificial intelligence techniques determine confidence measurements.
- 226. The system of claim 9, wherein artificial intelligence techniques determine uncertainty measurements.
- 227. The system of claim 9, wherein artificial intelligence techniques analyze acknowledgement information received through a television interface.
- 228. The system of claim 9, wherein artificial intelligence techniques generate recommendations for caregiver actions.

- 229. The system of claim 10, wherein artificial intelligence techniques select escalation pathways.
- 230. The system of claim 10, wherein artificial intelligence techniques select communication modalities.
- 231. The system of claim 10, wherein artificial intelligence techniques select intervention timing.
- 232. The system of claim 10, wherein artificial intelligence techniques generate escalation recommendations.
- 233. The system of claim 10, wherein artificial intelligence techniques generate caregiver recommendations.
- 234. The system of claim 10, wherein escalation outcomes are utilized for machine-learning training.
- 235. The system of claim 10, wherein escalation effectiveness measurements are utilized for machine-learning training.
- 236. The system of claim 10, wherein reinforcement-learning techniques are utilized to optimize escalation activities.
- 237. The system of claim 10, wherein historical escalation outcomes are analyzed.
- 238. The system of claim 10, wherein escalation success probabilities are generated.
- 239. The system of claim 10, wherein intervention success probabilities are generated.
- 240. The system of claim 10, wherein communication modalities are ranked according to predicted effectiveness.
- 241. The system of claim 10, wherein escalation pathways are ranked according to predicted effectiveness.
- 242. The system of claim 10, wherein escalation timing is dynamically modified according to predicted outcomes.
- 243. The system of claim 10, wherein artificial intelligence techniques determine escalation priorities.
- 244. The system of claim 10, wherein artificial intelligence techniques identify ineffective escalation pathways.
- 245. The system of claim 10, wherein artificial intelligence techniques recommend escalation pathway modifications.

- 246. The system of claim 10, wherein artificial intelligence techniques recommend intervention modifications.
- 247. The system of claim 10, wherein artificial intelligence techniques analyze caregiver response behavior.
- 248. The system of claim 10, wherein artificial intelligence techniques analyze escalation activities involving television-based welfare verification.
- 249. The system of claim 11, wherein availability of a caregiver is determined.
- 250. The system of claim 11, wherein caregivers are prioritized according to caregiver prioritization criteria.
- 251. The system of claim 11, wherein caregiver response times are monitored.
- 252. The system of claim 11, wherein caregiver response timeout conditions are detected.
- 253. The system of claim 11, wherein responsibility for an intervention activity is delegated from a first caregiver to a second caregiver.
- 254. The system of claim 11, wherein acceptance of delegated responsibility is recorded.
- 255. The system of claim 11, wherein caregiver workloads are balanced among a plurality of caregivers.
- 256. The system of claim 11, wherein caregiver collaboration workflows are maintained.
- 257. The system of claim 11, wherein professional monitoring organizations participate in welfare-related activities.
- 258. The system of claim 11, wherein a caregiver hierarchy is maintained.
- 259. The system of claim 11, wherein escalation activities are routed according to the caregiver hierarchy.
- 260. The system of claim 11, wherein welfare notifications are routed according to caregiver availability.
- 261. The system of claim 11, wherein caregiver acknowledgements are recorded.
- 262. The system of claim 11, wherein caregiver acceptance of intervention responsibility is recorded.

- 263. The system of claim 11, wherein responsibility is automatically reassigned when a caregiver fails to respond.
- 264. The system of claim 11, wherein responsibility is transferred according to caregiver-defined policies.
- 265. The system of claim 11, wherein intervention activities are coordinated among a plurality of caregivers.
- 266. The system of claim 11, wherein healthcare providers participate in coordinated intervention activities.
- 267. The system of claim 11, wherein emergency contacts participate in coordinated intervention activities.
- 268. The system of claim 11, wherein caregiver coordination activities involve welfare-verification information obtained through a television interface.
- 269. The system of claim 12, wherein the chronological record comprises immutable audit records.
- 270. The system of claim 12, wherein integrity of audit records is verified.
- 271. The system of claim 12, wherein escalation pathways are recorded and audited.
- 272. The system of claim 12, wherein welfare-state transitions are recorded and audited.
- 273. The system of claim 12, wherein confidence measurement histories are recorded and audited.
- 274. The system of claim 12, wherein verification outcomes are recorded and audited.
- 275. The system of claim 12, wherein intervention outcomes are recorded and audited.
- 276. The system of claim 12, wherein historical escalation events may be reconstructed from audit records.
- 277. The system of claim 12, wherein audit records are retained in long-term archival storage.
- 278. The system of claim 12, wherein audit records are utilized for machine-learning training.
- 279. The system of claim 12, wherein caregiver activities are recorded and audited.

- 280. The system of claim 12, wherein acknowledgement events are recorded and audited.
- 281. The system of claim 12, wherein communication activities are recorded and audited.
- 282. The system of claim 12, wherein audit records are utilized for compliance reporting.
- 283. The system of claim 12, wherein audit records are utilized for regulatory reporting.
- 284. The system of claim 12, wherein audit records are utilized for historical trend analysis.
- 285. The system of claim 12, wherein audit records are utilized for accountability verification.
- 286. The system of claim 12, wherein audit records are utilized to support future welfare determinations.
- 287. The system of claim 12, wherein audit records include activities associated with television-based welfare verification.
- 288. The system of claim 12, wherein audit records include activities associated with escalation processes.
- 289. The system of claim 12, wherein audit records include activities associated with caregiver coordination.
- 290. The system of claim 12, wherein audit records include activities associated with confidence assessments.
- 291. The system of claim 12, wherein audit records include activities associated with uncertainty assessments.
- 292. The system of claim 12, wherein audit records include activities associated with artificial-intelligence-assisted determinations.
- 293. The system of claim 3, wherein the television interface serves as a primary welfare communication interface within a residence.
- 294. The system of claim 293, wherein welfare-related communications are preferentially directed to the television interface before being directed to one or more alternative communication devices.

295. The system of claim 293, wherein the television interface functions as a household welfare terminal for receiving welfare-related communications.
296. The system of claim 293, wherein the television interface functions as a centralized welfare communication hub for a plurality of welfare-related activities.
297. The system of claim 293, wherein the television interface coordinates communications between an individual and one or more caregivers.
298. The system of claim 293, wherein the television interface serves as a primary acknowledgement interface for welfare verification activities.
299. The system of claim 293, wherein the television interface serves as a primary intervention interface for escalation activities.
300. The system of claim 293, wherein the television interface is utilized for welfare verification, welfare acknowledgement, intervention presentation, and escalation communications.

301. A caregiver notification and engagement system comprising:

one or more processors;

a memory storing instructions executable by the one or more processors;

wherein the one or more processors are configured to:

receive welfare-related information associated with a cared-for individual;

determine that one or more caregivers should be notified regarding the welfare-related information;

select one or more caregiver communication mechanisms from a plurality of available communication mechanisms;

initiate one or more caregiver communications utilizing the selected communication mechanisms;

determine whether one or more caregiver engagement criteria have been satisfied;

when the one or more caregiver engagement criteria have not been satisfied, perform one or more additional caregiver communication attempts utilizing the same communication mechanisms, one or more alternative communication mechanisms, or combinations thereof; and

continue caregiver communication activities until one or more caregiver engagement criteria are satisfied or one or more caregiver escalation criteria are satisfied.

- 302. The system of claim 301, wherein the plurality of caregiver communication mechanisms comprise text messaging.
- 303. The system of claim 301, wherein the plurality of caregiver communication mechanisms comprise telephone communications.
- 304. The system of claim 301, wherein the plurality of caregiver communication mechanisms comprise electronic mail communications.
- 305. The system of claim 301, wherein the plurality of caregiver communication mechanisms comprise mobile application notifications.
- 306. The system of claim 301, wherein the plurality of caregiver communication mechanisms comprise push notifications.
- 307. The system of claim 301, wherein the plurality of caregiver communication mechanisms comprise voice communications.
- 308. The system of claim 301, wherein the plurality of caregiver communication mechanisms comprise video communications.
- 309. The system of claim 301, wherein the plurality of caregiver communication mechanisms comprise wearable-device notifications.
- 310. The system of claim 301, wherein the plurality of caregiver communication mechanisms comprise smart-speaker notifications.
- 311. The system of claim 301, wherein the plurality of caregiver communication mechanisms comprise home-automation notifications.
- 312. The system of claim 301, wherein a plurality of caregiver communication mechanisms are utilized sequentially.
- 313. The system of claim 301, wherein a plurality of caregiver communication mechanisms are utilized simultaneously.
- 314. The system of claim 301, wherein communication mechanisms are selected according to caregiver-defined notification policies.
- 315. The system of claim 301, wherein communication mechanisms are selected according to caregiver availability information.
- 316. The system of claim 301, wherein communication mechanisms are selected according to historical caregiver responsiveness information.
- 317. The system of claim 301, wherein communication mechanisms are selected according to caregiver communication preference information.

- 318. The system of claim 301, wherein one or more caregiver communication attempts are repeated when a caregiver acknowledgement is not obtained.
- 319. The system of claim 301, wherein one or more caregiver communication attempts are repeated when a caregiver response is not obtained.
- 320. The system of claim 301, wherein alternative caregiver communication mechanisms are selected when prior caregiver communication attempts fail.
- 321. The system of claim 301, wherein caregiver communication attempts continue until a caregiver acknowledgement criterion is satisfied.
- 322. The system of claim 301, wherein caregiver communication attempts continue until a caregiver engagement criterion is satisfied.
- 323. The system of claim 301, wherein caregiver communication attempts continue until a caregiver acceptance criterion is satisfied.
- 324. The system of claim 301, wherein caregiver communications are escalated to one or more additional caregivers.
- 325. The system of claim 301, wherein caregiver communications are escalated to a professional monitoring organization.
- 326. The system of claim 301, wherein caregiver communications are escalated to one or more emergency contacts.
- 327. The system of claim 301, wherein caregiver communications are escalated to emergency services.
- 328. The system of claim 301, wherein caregiver communication activities are recorded within an audit trail.
- 329. The system of claim 301, wherein caregiver acknowledgement activities are recorded within an audit trail.
- 330. The system of claim 301, wherein caregiver engagement activities are recorded within an audit trail.
- 331. The system of claim 301, wherein caregiver communication effectiveness measurements are maintained.
- 332. The system of claim 301, wherein caregiver notification reliability measurements are maintained.
- 333. The system of claim 301, wherein caregiver acknowledgement reliability measurements are maintained.
- 334. The system of claim 301, wherein caregiver engagement measurements are maintained.
- 335. The system of claim 301, wherein caregiver intervention effectiveness measurements are maintained.

- 336. The system of claim 301, wherein historical caregiver communication information is recorded and analyzed.
- 337. The system of claim 301, wherein historical caregiver responsiveness information is recorded and analyzed.
- 338. The system of claim 301, wherein historical caregiver acknowledgement information is recorded and analyzed.
- 339. The system of claim 301, wherein historical caregiver intervention information is recorded and analyzed.
- 340. The system of claim 301, wherein caregiver communication preference profiles are maintained.
- 341. The system of claim 301, wherein caregiver communication mechanisms are selected according to caregiver communication preference profiles.
- 342. The system of claim 301, wherein caregiver-specific retry schedules are maintained.
- 343. The system of claim 301, wherein caregiver-specific escalation pathways are maintained.
- 344. The system of claim 301, wherein caregiver communication routing is determined according to historical caregiver behavior.
- 345. The system of claim 301, wherein caregiver prioritization is determined according to historical caregiver behavior.
- 346. The system of claim 301, wherein caregiver communication timing is determined according to historical caregiver behavior.
- 347. The system of claim 301, wherein caregiver communication frequency is determined according to historical caregiver behavior.
- 348. The system of claim 301, wherein caregiver communication mechanisms are selected using artificial intelligence techniques.
- 349. The system of claim 301, wherein caregiver communication sequencing is selected using artificial intelligence techniques.
- 350. The system of claim 301, wherein caregiver retry intervals are selected using artificial intelligence techniques.
- 351. The system of claim 301, wherein caregiver escalation pathways are selected using artificial intelligence techniques.
- 352. The system of claim 301, wherein caregiver communication effectiveness is predicted using artificial intelligence techniques.

- 353. The system of claim 301, wherein caregiver responsiveness is predicted using artificial intelligence techniques.
- 354. The system of claim 301, wherein caregiver acknowledgement probability is predicted using artificial intelligence techniques.
- 355. The system of claim 301, wherein caregiver engagement probability is predicted using artificial intelligence techniques.
- 356. The system of claim 301, wherein caregiver intervention probability is predicted using artificial intelligence techniques.
- 357. The system of claim 301, wherein communication attempts are dynamically modified based upon caregiver responsiveness measurements.
- 358. The system of claim 301, wherein communication attempts are dynamically modified based upon caregiver engagement measurements.
- 359. The system of claim 301, wherein communication attempts are dynamically modified based upon caregiver acknowledgement measurements.
- 360. The system of claim 301, wherein communication attempts are dynamically modified based upon caregiver intervention measurements.
- 361. The system of claim 301, wherein communication attempts are dynamically modified based upon caregiver notification reliability measurements.
- 362. The system of claim 301, wherein the system learns caregiver-specific communication strategies from historical caregiver interactions.
- 363. The system of claim 301, wherein the system generates caregiver-specific communication recommendations.
- 364. The system of claim 301, wherein the system generates caregiver-specific escalation recommendations.
- 365. The system of claim 301, wherein caregiver communication activities, caregiver engagement activities, caregiver acknowledgement activities, caregiver intervention activities, and caregiver escalation activities are utilized to continuously optimize future caregiver notification activities.

8. ABSTRACT

A system and method for progressive welfare verification and escalating intervention are disclosed. The invention is configured to determine, assess, infer, estimate, or otherwise evaluate the welfare status of a cared-for individual through one or more verification activities, communication activities, monitoring activities, and intervention activities. Welfare verification requests may be communicated through one or more communication modalities including visual, audio, electronic, network-based, wireless, sensor-based, or other interaction mechanisms.

The invention may utilize progressive verification procedures in which information is obtained from a plurality of sources and used to reduce uncertainty regarding the welfare status of the cared-for individual. An escalation engine may transition through multiple escalation states, progressively increasing communication prominence, verification efforts, information gathering activities, caregiver involvement, and intervention activities until sufficient confidence regarding welfare status is achieved or one or more termination criteria are satisfied.

In various embodiments, welfare status determinations may be based upon confirmations, responsiveness measurements, historical behavior analysis, confidence assessments, sensor information, environmental information, caregiver input, artificial intelligence

analysis, or combinations thereof. The invention may further maintain auditable records of verification activities, escalation actions, confirmations, and welfare determinations.

In one preferred embodiment, welfare verification requests are communicated through a television-based interface and may be progressively escalated through visual, audio, and multi-modal interaction mechanisms. The invention may be implemented in healthcare, caregiving, senior living, wellness monitoring, post-surgical monitoring, hospitality, institutional, residential, commercial, and other environments.