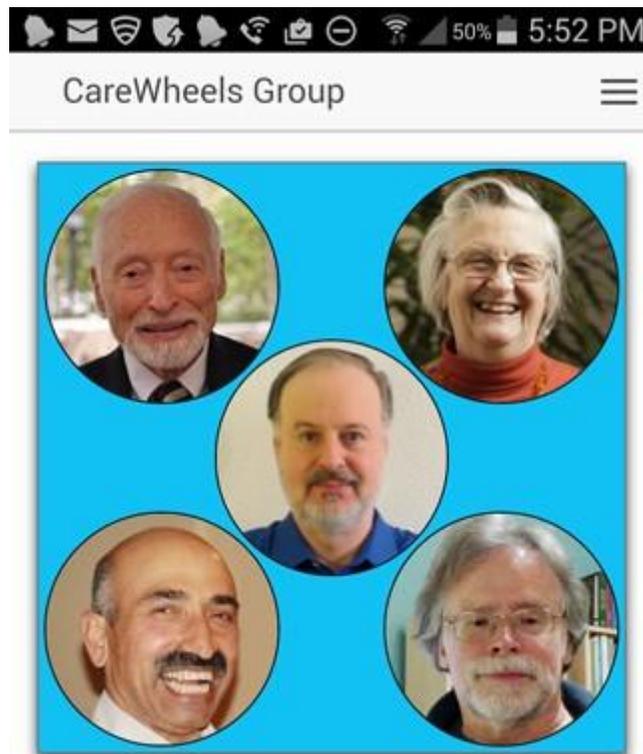




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[CareWheels.org/CareBank](http://CareWheels.org/CareBank)



## The Value of CareBanking

According to the [United Nations report Population Ageing 2015](#), population aging is poised to become one of the most significant social transformations of the 21st century, with implications for most sectors of society. The Report further states that growth in the number of elders is a global phenomenon, especially in Europe and in North America, where by 2030 elders will account for more than 25% of their populations. The Report then identifies the proliferation of technologies such as mobile devices that offer new channels for reaching elders and bridge the digital divide to help prevent, treat or mitigate age-related chronic conditions and diseases.

As Americans grow older, 92% of those surveyed by AARP said that they want to remain in their own homes for as long as possible. Two thirds of today's elders are living alone. Many have small, dispersed families without spouses, siblings or children to provide caregiving resources. Today, elders living in isolation within our communities are one of the largest and fastest-growing underserved populations. Most elders are aging in their homes by choice or necessity, while home health care services are not scaling-up to meet their rising needs. Presently we face rising home care workforce shortages.

Our society has insufficient resources to provide professional, institutional care services for every elder, nor does every elder want or need them. Increasing dependence on increasingly costly professional services leads to financial hardship and social isolation; hence the value of social networks increases as we age. People who are integrated into social networks tend to

experience less anxiety and loneliness. Anxiety in elders has been linked to suffering from illness, cognitive decline, sleep disturbances and hospitalization. Loneliness is a common source of anxiety and poor quality-of-life, a key predictor of cognitive decline, depression, substance abuse and suicide.

CareWheels is developing innovative tools and services that support successful aging-in-place. Our research has demonstrated the synergistic benefits of an interdependent peer-care model, which we call I-Care (Interdependent-Care). I-Care empowers elders – our absolutely greatest growing natural resource – with the knowledge, skills, tools and connections to both give and receive care and support services from the comfort of home, using social technologies including TeleCare and TimeBanking to convert their untapped resources to provide mutual care.

CareWheels developed the CareBank to harness TeleCare and TimeBank social network technologies. TeleCare is a technology-mediated service that uses smart-home sensors to continuously assess a person’s wellbeing. TimeBanks are mutual service networks that monetize interpersonal exchanges as time-based credits to reward mutual service and enhance community services by converting surplus human capital into shared social capital with which to provide essential services like caregiving.

The CareBank rewards people as key assets in the mutual production of affordable home care and support services, allowing people to live in their own homes. The CareBank enables people to exchange services that they might otherwise not be able to afford and to invest by paying-it-forward. Engagement in mutual care facilitates social connectedness and community involvement, two of the most powerful determinants of health and well-being. In this way, I-Care tackles social isolation and financial hardship for the burgeoning population of elders, allowing more people to age-in-place in their homes and remain connected to their communities.

## The CareBank App and Platform

The CareBank platform consists of a mobile app, sensor system and server that provide TeleCare and online TimeBank services. The CareBank integrates peer-to-peer TeleCare assessment with TimeBank micro-credit. Our key innovation is the integration of several recommendations of the [President’s Council of Advisors on Science and Technology on Independence, Technology, and Connection in Older Age](#).

### Independence, Technology, and Connection in Older Age



The President’s Council of Advisors on Science and Technology, March 2016

Excerpt (pg.11)

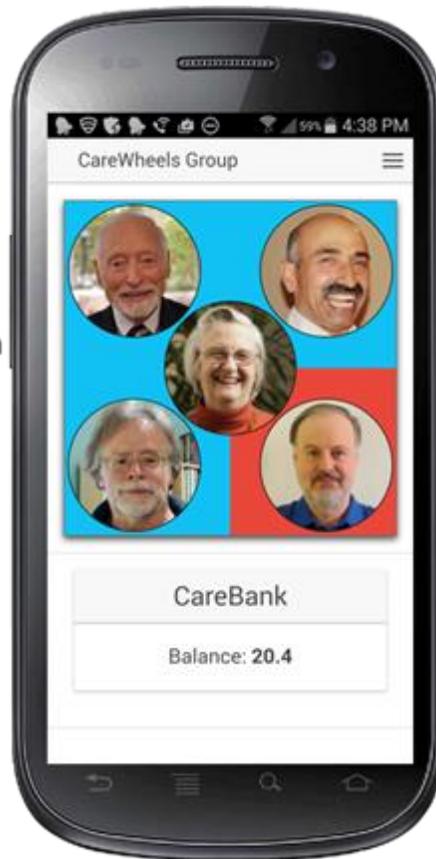
“A few examples illustrate technology’s usefulness. ...**Remote monitoring, wearables, and sensors** can help seniors age in place while ensuring their safety and maintaining their health. ...Online “**time banks**” can allow seniors to donate services now in order to access help from others when they need it.”

The CareBank integrates TeleCare remote sensor monitoring and TimeBanking to convert our surplus human capital into shared social capital, empowering people to live interdependently, take better care of each other, and uphold the social determinants of health.

# CareBank = TeleCare + TimeBank

## TeleCare

- Elder circle of peers
- Engage in co-production
- Provide mutual care
- Support aging-in-place
- Color = current state of each peer in the circle



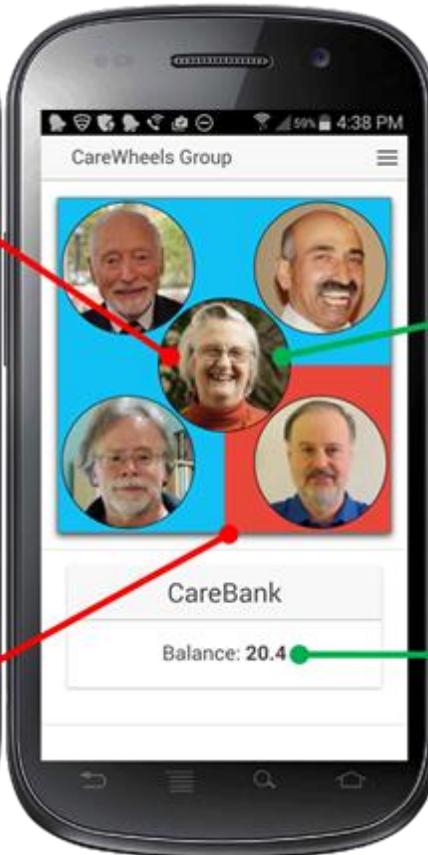
## TimeBanking

- Values peers as assets
- Human to social capital
- Monetizes care services
- Rebuilds core economy
- Automates accounting and big data collection

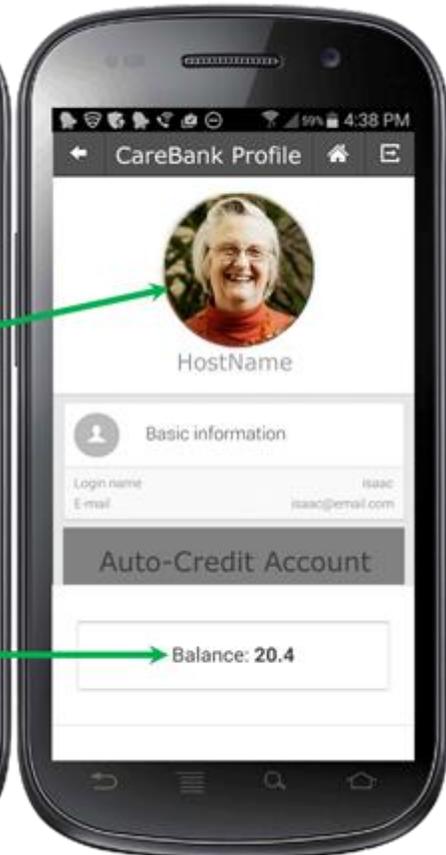
## TeleCare Screen



## Main Screen



## TimeBank Screen



On the Main Screen the CareBank hub-and-spokes network is represented as a CareWheels Group. Each user of the CareBank is placed at the center of their own social care group, surrounded by the other members of their group, such that each user sees themselves at the center of their CareWheel surrounded by their fellow group members. If the TeleCare sensors detect anomalies such as missed meals or meds, the background color surrounding a member's photo will change to indicate an appropriate yellow or red alert. Simply tapping the member's photo on the Main Screen invokes the TeleCare Screen revealing the member's status and cause of the alert. For example, in this screen-shot the member missed their midday meal, causing a yellow alert. After five hours of yellow alert without taking a meal, the status escalated to red alert, prompting other CareWheels Group members to call and help resolve the anomaly. While members are actively engaged in monitoring and responding to anomalies, their TimeBank accounts are being automatically micro-credited in the background.

Each person's needs will determine the choice of sensors to deploy. A variety of sensors including: activity (behavioral) sensors, physiological (vital signs) sensors and environmental (temperature) sensors may be used to detect anomalies (variations of habitual behavior or other abnormalities). An anomaly may be a deviation from any expected activity pattern or behavior, an abnormal physiological function or a deviation from preset environmental conditions. Anomaly detection methods convert sensor data into actionable information using data processing algorithms that may be based on logic, rules, statistical inference, verification of habitual behavior or a combination of methods.

The remuneration method may be based on peer-to-peer micro-payments, credits and debits, dual currency systems or a combination of methods. Dual currency systems that use a combination of national currency and an alternative currency such as Time Dollars offer flexible means to remunerate service providers, for example: payment in US Dollars for groceries and payment in Time Dollars for time spent cooking and delivering meals.

In this way, the CareBank supports people's desire to age-in-place safely in their own homes and communities. It constitutes a new use of existing technologies that transforms conventional care services from a business-to-consumer model into peer-to-peer care, by equipping elders with TeleCare technology and remunerating them as key assets in the mutual production of affordable care and support services. The CareBank enables people to exchange services that they might otherwise not be able to afford while investing in their own community by paying-it-forward. Mutual care helps tackle social isolation and financial hardship, allowing more people to age-in-place safely in their own homes and remain connected to their communities. Engagement in mutual care facilitates social connectedness and community involvement, two of the most powerful determinants of health and well-being. CareBanking has the potential to improve elders' quality-of-life and reduce health care costs by detecting anomalies to avert crises, thus reducing preventable emergency room visits, hospital admissions and post discharge hospital readmissions.

## 7 Advantages of CareBanking:

1. Supports people who wish to live independently at home by networking them together to live more interdependently in their communities.
2. Advances TeleCare by involving the beneficiaries as active subjects who are engaged in the mutual production of care services rather than objectifying them as passive recipients of monitoring services.
3. Empowers people living with disabilities and chronic health conditions, especially frail elders, with technologies to give and receive care services from the comfort of their homes.
4. Engages people in meaningful working relationships that provide a renewed sense of purpose to the lives of people who may otherwise suffer from social isolation and its related comorbidities.
5. Generates rich data sets from both TeleCare sensor data streams and TimeBank transaction records with which to iterate CareBank design, evaluate efficacy and measure Return On Investment.
6. Scales to meet the emergent needs of the aging demographic cohorts by empowering them with technologies and employing them to provide mutual care through social care networks.
7. Saves money and reduces needless suffering by preemptively averting crises to reduce the high costs of avoidable emergency room visits and preventable hospital (re)admissions.

CareBanking will help resolve the caregiver shortage, escalating cost and social isolation crises at their source, by leveraging elder power to provide new caregiving resources that are capable of scaling to meet the emergent needs of our aging society and reconnecting people to take better care of themselves by taking good care of each other.

Leonard Nimoy said it simply:

The Vulcan Mr. Spock said: *Live long and prosper.*



The Elder Leonard Nimoy said: *The miracle is this: The more we share the more we have.*



[CareWheels "Disruptive Aging" Presentation](#) to the Oregon Gerontological Association 2016

For more information, please see CareWheels Founder Claude Goodman's presentation to the OGA Annual Conference on September 30, 2016 in which he explored the disruptive potential of Gerontechnology and presented the CareBank model of Interdependent Care.

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