

# **State of Technology in Aging Services According to Field Experts and Thought Leaders**

**By:**

Majd Alwan, Ph.D.,

Center for Aging Services Technologies (CAST)

American Association of Homes and Services for the Aging (AAHSA)

and

Jeremy Nobel, M.D., M.P.H.,

Harvard School of Public Health

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to Field Experts and Thought Leaders**



**Center for Aging Services Technologies**

A program of the  
American Association of Homes  
and Services for the Aging (AAHSA)

2519 Connecticut Ave., NW  
Washington, DC 20008-1520  
Phone (202) 508-9416  
Fax (202) 220-0032

Web site: [www.agingtech.org](http://www.agingtech.org)

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## 1. INTRODUCTION

In Phase I of this project, a vision for Information Technology Enabled Care for seniors was developed. Important stakeholders in the care process, including informal caregivers, were identified. Each stakeholder group learned about the value of technology-enabled care from their perspective in the care process.

Technologies were divided into three broad categories:

- Safety enhancing technologies
- Technologies for health and wellness
- Social connectedness technologies

Phase I report reviewed existing and “under development” technologies in each category along with their advantages, disadvantages, conditional requirements for actualizing their potential and evidence of their value from published literature, where available.

In Phase II, 16 industry “thought leaders” and experts were interviewed to refine the opportunity for accelerating the development of aging-services information technologies. These experts also helped to identify and categorize barriers and obstacles that hinder technology adoption and use in the field. Stakeholder awareness, intrinsic technical performance capability, consensus on value and understanding and acceptance of operationally sustainable models were all identified

as being necessary for the proliferation of information technologies in aging services.

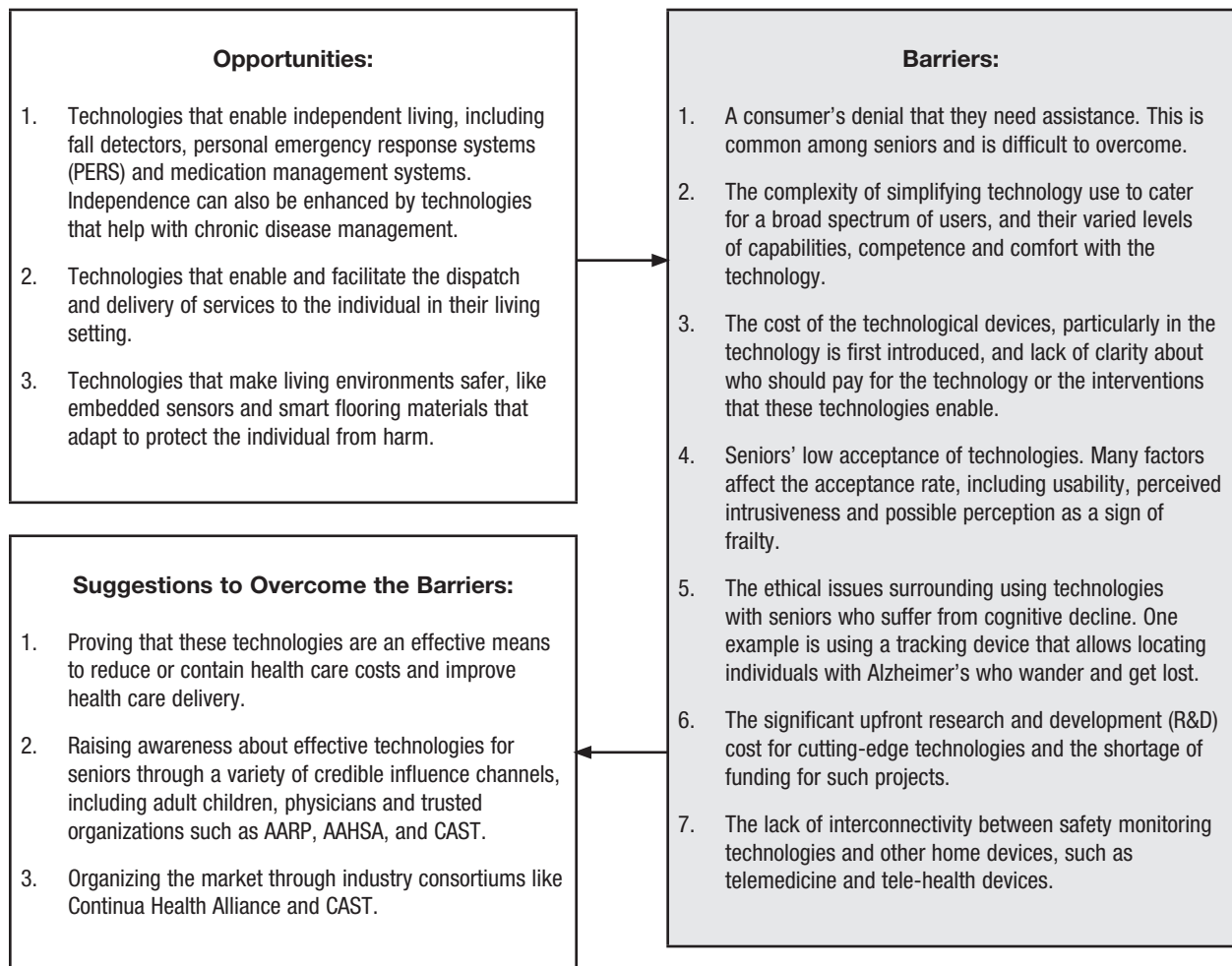
The research team conducted a gap analysis to identify deficiencies in the awareness, technical capabilities and operating models for “aging in place” technologies. The experts were asked to suggest immediate as well as longer-term activities that could close the gaps in these areas. Experts were also asked to identify promising business models that would facilitate the deployment and effective use of these technologies, with some attention to social and economic “forcing functions” that may affect the proliferation of these technologies.

Responses were synthesized, summarized and presented in four sections:

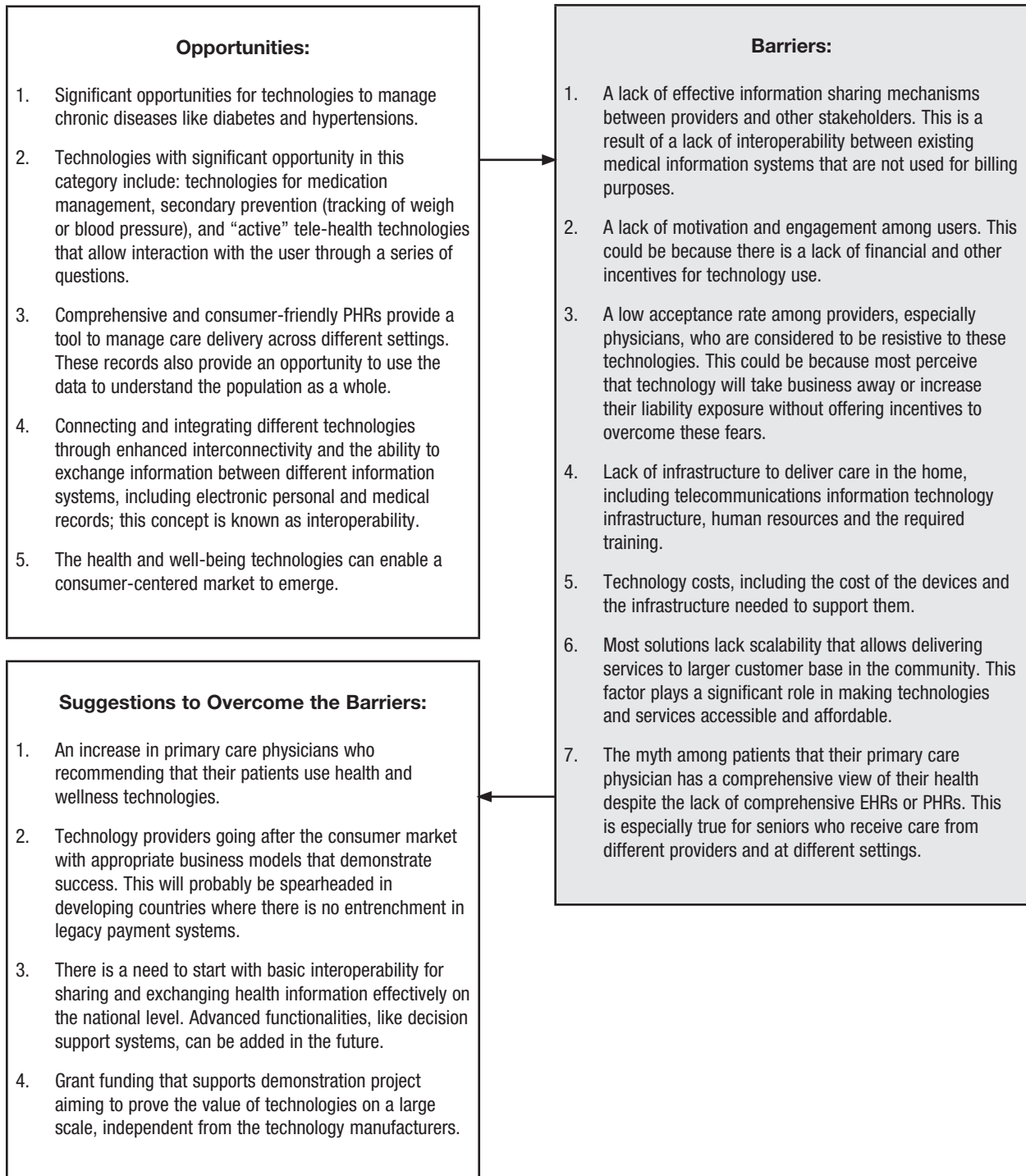
- Opportunities, Related Barriers and Overcoming Them
- Critical Gaps in Current Environment
  - Awareness
  - Technical Solutions
  - Consensus on Value
  - Accepted Business and Operating Models
- Promising Business Models
- Forcing Functions to Drive Progress

## 2. OPPORTUNITIES, BARRIERS AND OVERCOMING THEM:

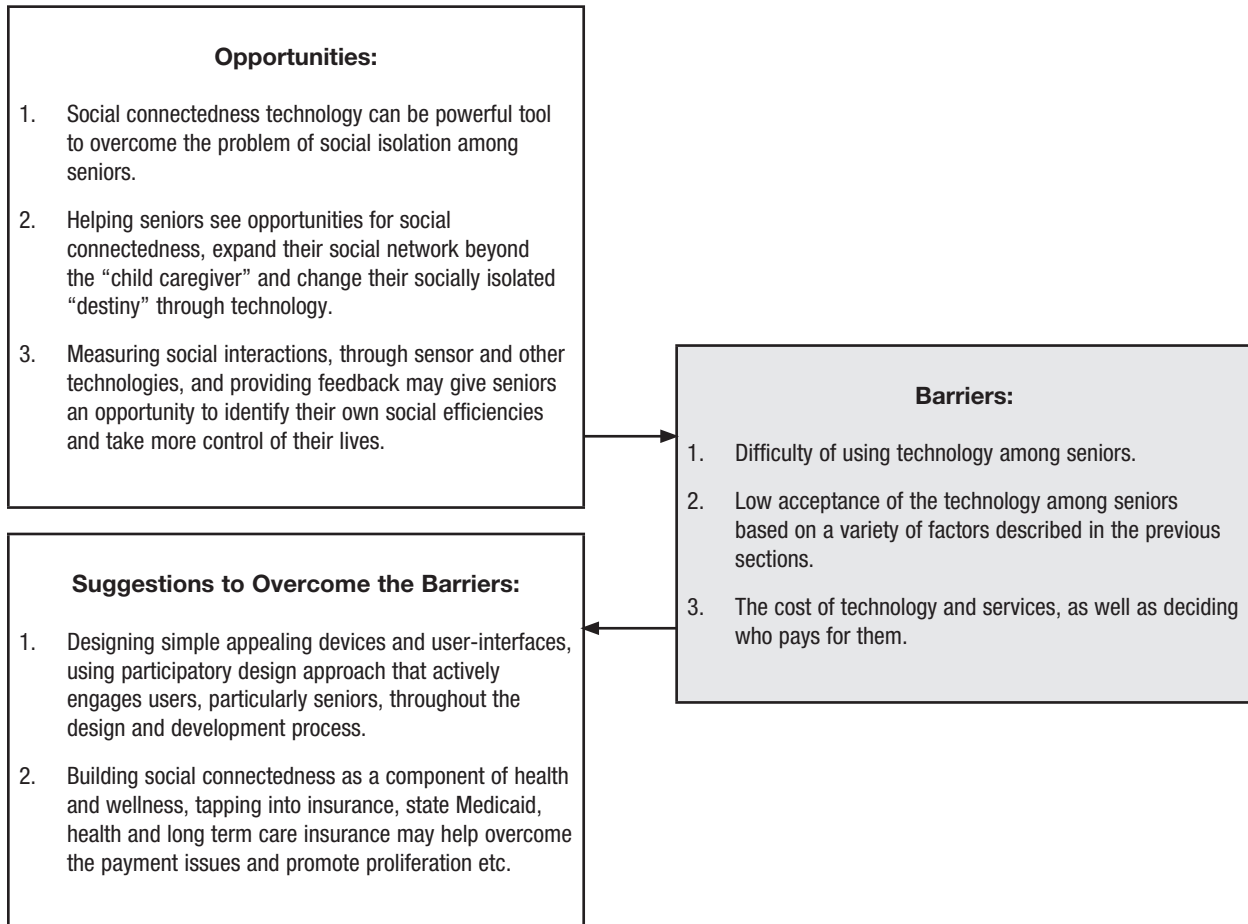
### 2.1. Safety Technologies – Opportunities And Barriers:



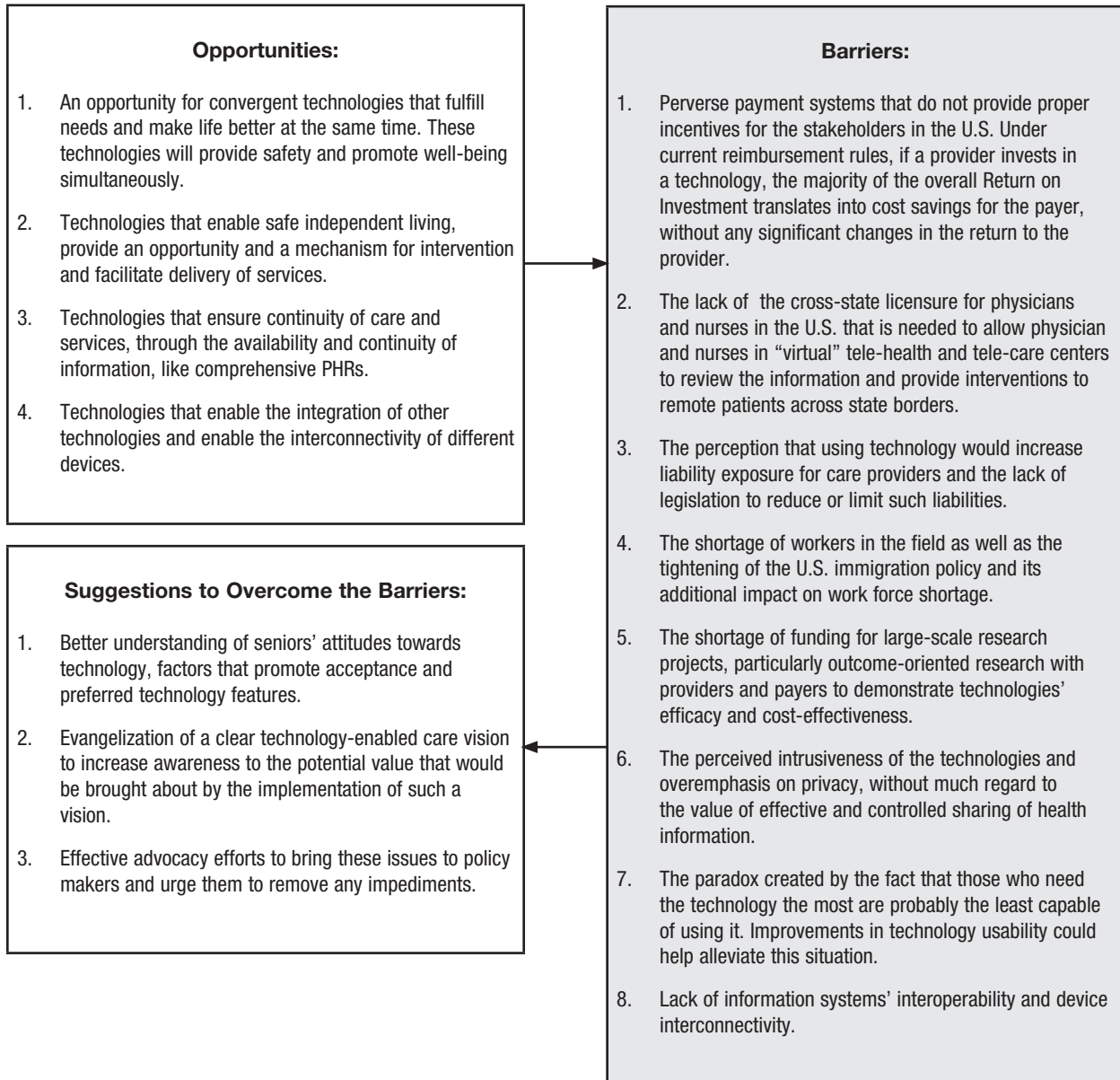
## 2.2. Health and Wellness Technologies – Opportunities and Barriers:



### 2.3. Social Connectedness Technologies — Opportunities and Barriers:



## 2.4. Aging-Services Technologies (Global Observations) – Opportunities and Barriers:



*Note:* Other countries may not have some of the above mentioned barriers.

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### 3. CRITICAL GAPS IN THE CURRENT ENVIRONMENT:

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Addressing the following critical gaps in the current environment was deemed essential to accelerating “Aging in Place” technology’s proliferation and success:

1. **Awareness** of the existence of “Aging in Place” technologies by potential users and other stakeholders.
2. **Availability of technical solutions** with acceptable characteristics including robustness, reliability, usability, install-ability and the ability to work in the intended setting/environment, that will allow them to be successful.
3. **Consensus on value**, which describes the agreement by the stakeholders that the technology delivers on its promised value proposition and is worthwhile.
4. **Accepted business and operating models** that support the ability to design, implement, evaluate, optimize, and sustain effective “Aging in Place” technologies.

The interviewees were asked to identify the gaps and give recommendations to bridge the gaps in these four critical areas.

#### 3.1. Safety Technologies–Evaluating the Gaps:

##### 3.1.1. Safety Technologies–Awareness

Shortage of awareness was generally acknowledged among experts. There may be awareness among pioneers, but conveying the vision to constituents and other organizations is both challenging and costly.

The recommendations to bridge the awareness gap can be summarized as follows:

1. There is a role for public policy, as well as major industry, to raise awareness about existing safety technologies and their value to seniors.
2. Promoting a culture of under-promising and over-delivering in the safety technologies industry would reflect positively on the awareness, and ultimately the proliferation, of these technologies.
3. Learning from the United Kingdom model in using the results of outcome-oriented pilots to raise awareness to these technologies and their potential value.

4. Raising awareness through exhibits and demonstrations through professional organizations and consortiums.

### **3.1.2. Safety Technologies–Technical Solutions:**

The gaps in the robustness, ease of installation, usability of the technologies as well as the complexity of the products and the information about them were acknowledged.

The recommendations to bridge the gap include:

1. There is a need to understand how seniors interact with technology and use the lessons learned to design technologies that would promote use among seniors.
2. More extensive on-line and hands-on training to caregivers and opportunities to experience the technology in the field. Learning from their feedback would not only improve the design of the technologies, but also enhance the processes of technical support.
3. Resolving lack of interconnectivity between safety technologies and other home-based technologies to support the integration of information.

### **3.1.3. Safety Technologies–Consensus on Value:**

The lack of global consensus on value was acknowledged, but it should be noted that this gap has not stopped companies from bringing products to market. More effort is needed to prove the value of this category of technologies industry-wide.

The recommendation to bridge the gap includes:

1. More outcome-oriented research demonstration projects through various funding sources including foundations, the VA and U.S. Department of Defense that demonstrate the benefit to stakeholders.

### **3.1.4. Safety Technologies–Business and Operating Models:**

There was a consensus that the main impediment for operational models was the legacy payment models that do not provide incentives for the stakeholders to invest or put processes and operations in place to make the most of these technologies.

The recommendations to bridge the gap include:

1. Starting a dialogue with “payers” to have models that have better alignment/ distribution of incentives that will make it more conducive to use technologies.

2. Shifting to evidence-based practice by providers may expedite the development of such operating models because the evidence supporting the models' effectiveness and efficacy would be readily available.
3. Shifting the paradigm from long-term care to long-term housing. This shift will stimulate thinking about integrating and proactively using these technologies in the home earlier in life.
4. Encouraging organizations that developed successful models, including processes, services, resources and revenue sharing, to license their models to others. One example is the well-established "Call Center" model.

### **3.2. Health and Wellness Technologies–Evaluating the Gaps**

#### **3.2.1. Health and Wellness Technologies–Awareness:**

There is an awareness gap among providers about technologies' value and technical capabilities.

The recommendations to bridge these gaps include:

1. Increasing awareness of value, once demonstrated, to the general public through a national awareness campaign.
2. Educating providers on the technical capabilities of technologies.

#### **3.2.2. Health and Wellness Technologies–Technical Solutions:**

There are gaps in interconnectivity and interoperability, usability (user interface design, and data presentation), ease of installation by consumers and home health nurses, and effective technical support.

The recommendations to bridge these gaps include:

1. Using a participatory design approach to design and build products to commoditize these technologies and increase their adoption.
2. Designing technologies with the greatest common divisors in mind to support wide proliferation and adoption. One example would be using plain old telephone system lines as opposed to high speed fiber optic connectivity.
3. Enhancing interconnectivity between different technologies, such as telemedicine and tele-health devices, through standard communications protocols.

4. Developing standard terminology and harmonizing standards for EHRs and PHRs to allow providers and other stakeholders to exchange health information efficiently and effectively.
5. Using OpenSource, which allows sharing the source code of all software components implemented, as the building blocks for health information technology infrastructure for accelerated health information interoperability and information exchange.

### **3.2.3. Health and Wellness Technologies–Consensus on Value:**

The consensus on value gap was widely acknowledged as the area where most efforts need to concentrate; most evidence is on small samples and in the form of case studies. Moreover, there is shortage of efficacy proof for stakeholders to consider.

However, it was pointed out that proving value is related to the misalignment of incentives issue that is inherent to the current payment system in the United States. This finding raises the question of “to whom should we prove the value of technology?” In the authors’ opinion, the value to all the different stakeholders should be addressed.

The recommendation to bridge this gap includes:

1. Funding large independent demonstration projects in concentration communities that incorporate health economics specialists, with payer participation, to show value.

### **3.2.4. Health and Wellness Technologies–Business and Operating Models:**

Misalignment of incentives, and the lack of sustainability of operations it causes, and the lack of national infrastructure for health information technology were acknowledged. Packaged service models are promising and facilitate adoption for providers, particularly those who lack the infrastructure.

The recommendations to bridge these gaps include:

1. Clarifying and augmenting the Human Insurance Portability and Accountability Act to allow and encourage electronic access and sharing of information (even in the existing format, using the “copy charge” to subsidize the physicians’ ability to interface and read the information in the interim).
2. Exploring with models and health plans that encourage network providers to share information with clients, and incorporating incentives for compliant users as well as penalties for users who are persistently non-compliant into the design of benefits.

3. Limiting providers' liability exposure because of technology through the appropriate legislation.
4. Re-examining, and possibly reengineering, care delivery processes with all their components (including human resources and their training) before applying automation and information technologies to them.

### **3.3. Social Connectedness Technologies–Evaluating the Gaps:**

#### **3.3.1. Social Connectedness Technologies–Awareness:**

The gap in awareness of available technologies as well as marketing channels for existing products, especially among seniors, was widely acknowledged by interviewees.

The recommendations to bridge these gaps include:

1. Increasing awareness of available technologies, and their marketing channels, through trusted information resources, including care providers, consortiums, as well as consumer and professional organizations.

#### **3.3.2. Social Connectedness Technologies–Technical Solutions:**

The gaps in the robustness, install-ability, usability of the technologies, the security and privacy concerns, and the lack of (and the substantial need for) technical support were widely acknowledged. In addition, the difficulty in learning and interpreting sensory data to understand social behavior was also pointed out.

The recommendations to bridge these gaps include:

1. Simplified device and user interface designs through participatory design approach that engages the users, particularly seniors.
2. Offering training on the use of technology for seniors, as part of the deployment and commissioning of services.
3. Offering enhanced technical support that is accessible and suitable for seniors to eliminate the abandonment of use of the technology due to the lack of accessible technical support.
4. Improving interconnectivity between social connectedness technologies and other home-based technologies (such as telemedicine devices and/ or safety technologies).

### **3.3.3. Social Connectedness Technologies–Consensus on Value:**

Consensus on value is lacking and needed, and misalignment of incentives might be a hurdle to achieving such consensus. However, consensus on value was not viewed as a gateway for this category of technologies (unlike safety, and health and wellness technologies, where it is the consensus on value is considered more important).

The recommendations to bridge the gap include:

1. There is a need to demonstrate value including convenience, simplicity, and safety through outcome-oriented demonstration projects. The qualification of convenience as an aspect of the value proposition was unique to the social connectedness technologies and is noteworthy.
2. A conference convening industry leaders with government, technology companies, consumers, physicians, payers, family and other informal caregivers, industry consortiums (CAST and Continua) might help define the value proposition problems and brainstorm recommendations to attain such consensus.

### **3.3.4. Social Connectedness Technologies–Business and Operating Models:**

Experts and thought leaders agreed that the biggest hurdle to the operating models was the lack of clarity on who pays for, who to sell to (seniors, caregivers etc), who installs, and who supports these technology.

The recommendations to bridge the gap include:

1. Linking social connectedness technologies to health and wellness is one way to get successful operating models to secure payment for these technologies, apart from private pay (the currently prevalent operating model for most technologies).
2. There is a potential for major employers to support these technologies if there is demonstrated value to them and their employees (to solve the lost productivity due to absenteeism and presenteeism phenomena of workers caring for aging parents).

### **3.4. Aging-Services Technologies (Global Observations)–Evaluating the Gaps:**

#### **3.4.1. Aging-Services Technologies (Global Observations)–Awareness:**

Awareness of aging services technologies, especially their value, is generally lacking.

The recommendation to bridge the gap includes:

1. Raising awareness through “trusted” agents including adult children and physicians, or organizations, possibly by launching an awareness campaigns to the states and nationwide.

#### **3.4.2. Aging-Services Technologies (Global Observations)–Technical Solutions:**

The gaps in the robustness, install-ability, usability, scalability of the technologies as well as the understanding of needed infrastructure among providers were acknowledged.

The recommendations to bridge these gaps include:

1. Continua’s standards effort will help overcome some of the technical interconnectivity issues. However, more Venture Capital is needed to enhance and expand Continua’s effort industry-wide.
2. More effort is needed to raise the awareness of the long-term care (LTC) sector to the technical and infra-structure requirements for these technologies.
3. A systematic approach to R&D that uses participatory design and engages users is needed.

#### **3.4.3. Aging-Service Technologies (Global Observations)–Consensus on Value:**

The lack of consensus on value (the little available evidence is on small sample size) was acknowledged, and its connection to misalignment of incentives in the payment (reimbursement system) was pointed out.

The recommendation to bridge the gap includes:

1. Planning and funding large-scale demonstration projects with significant financial analysis to prove the ROI is needed to show the value of, and satisfaction with, the technology.

#### **3.4.4. Aging-Services Technologies (Global Observations)–Business and Operating Models:**

There was a consensus that the main gap for operating models was the lack of clarity on who pays for, who to sell to (seniors, caregivers, providers etc.), who installs, and who supports these technology, who intervenes, and how each player is compensated (and by whom); in addition, it

was pointed out that this lack of clarity is probably due to the entrenchment in legacy payment (reimbursement) models.

The recommendations to bridge these gaps include:

1. Planning experiments with large care providers and payers to find the right business and operational model(s) that have the appropriate incentives to stakeholders.
2. Developing a “Grand Challenge” competition for business schools to create business and operational models and a “road map” to implementing such models may result in innovative operating models that break free from entrenched legacy models.

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#### **4. PROMISING BUSINESS MODELS:**

##### **4.1. Safety Technologies–Promising Business Models:**

1. Delivering safety monitoring services through established care providers with track record and reputation in the community is a promising model for service delivery.
2. Using technology as a service enabler in a PACE-like model that combines social and medical aspects and has better alignment of incentives.
3. Using a form of integrated funding, like PACE or Special Needs Plans (SNPs) and a commitment to align incentives to properly finance long-term care.
4. Investigating the potential for a consumer-driven market.

##### **4.2. Health and Wellness Technologies–Promising Business Models:**

1. Developing a hybrid payment system that combines aspects of prospective payment and pay for performance systems.
2. The Veterans’ Affairs (VA) Health System has good incentive alignment and a an effective Personal Health Record that can be possibly adapted to all federal employees and Medicare population, and may be possibly licensed to be implemented by others using OpenSource; however, the salaried physicians’ aspect is not replicable outside the VA.
3. Using PACE-like models that combine social and medical aspects with a alignment of incentives.

4. Establishing Medicare demonstration projects that offer providers incentives for using technology.
5. Developing a PERS model to sell additional products and services as a possible market entry strategy.

#### **4.3. Social Connectedness Technologies–Promising Business Models:**

1. Developing Private pay marketing to adult children as “convenience” and “safety” enhancing tools.
2. Using trusted referral channels was identified as a plausible market entry strategy.
3. Integrating social connectedness technologies with other health and wellness technologies and having Medicaid cover part of the cost (similar to subsidizing heating oil cost for seniors) to overcome the payment hurdle and making the technologies accessible.
4. The social connectedness technologies could offer a marketing competitive edge/ differentiator in assisted-living. This could be factored into providers’ operating models for subsidies.

#### **4.4. Aging-Services Technologies (Global Observations)–Promising Business Models:**

1. Technologies are evolving, and so are the business models. There is a need for socio-economic, cultural and economic models of care. These models will likely evolve in Asia, where there isn’t entrenchment in out-dated care models or payment systems.
2. In the United States, there are promising aspects of models like PACE, the VA health system, Medicare Advantage, Medicare Advantage for Special Needs Populations, pay for performance, as opposed to pay for service. These models value the knowledge of the healthcare professional and the relationship of trust with their clients, and offer a better alignment of incentives.
3. There is also hope that Medicaid programs will evolve quicker than others to be more conducive of the use of technology due to more extreme pressures.

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## 5. FORCING FUNCTIONS TO DRIVE ADOPTION OF AGING SERVICES TECHNOLOGIES:

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Forcing functions generally cut across categories of technologies and thus are summarized aggregately.

Experts identified the following forcing functions:

1. Demographic trends and economics: increasing number of seniors, rising care costs, growing burdens of care and chronic illnesses family caregivers, mounting pressures on cutting fees and shortage of caregivers are all trends that must be considered.
2. Demonstrated value, customer sensitivity, awareness through large trusted organizations and the marketplace could be the most effective forcing functions.
3. New generation of baby boomers as elders demanding a different lifestyle in their “retirement” years.
4. Technology-enabled care’s position as a strategic growth area for large technology companies and making significant investment in the market.
5. Large employers with an incentive program could be a catalyst in the marketplace.
6. The experience and lessons learned from other countries who are dealing with aging populations successfully both in Europe and Japan.

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## 6. CONCLUSIONS:

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Interviewed thought-leaders universally acknowledged that demographic trends and the attractive potential benefit of IT to support aging services constitute powerful forcing functions to drive their adoption. This opportunity makes it an imperative for us to consider technology-enabled care to curb skyrocketing care costs and provide care, comfort and safety for the projected increase in the senior population despite the predicted shortage of care professionals.

The current inefficient and inadequate payment and reimbursement systems in the United States surfaced as the most critical barrier for the adoption of these technologies. There was no consensus on a single promising business model conducive of technology that existed today; however, there was a consensus on promising aspects of existing business models that could be extended and modified to address the need.

The expert interviews indicated that requirements for the success of these technologies, and hence enabling the technology-enabled care vision, were highly varied, touching on technical, economic, organizational, societal and readiness concerns. Important requirements included interconnectivity between different and disparate clinical information technology systems, needed to guarantee completeness and continuity of information between the home and long-term care settings and assuring continuity of care.

Additional critical success factors included the need to address organizational integration and adoption of new work-flow strategies, development of innovative business models to sustain operations, and the training and availability of technical support personnel to manage new processes, delivered in both managed and non-managed environments.

In addition, acceptance and usability of the technology by end-users, were cited as critical for the proliferation of technology. There was a consensus that these technical issues could be overcome by taking a systematic approach to R&D that involves the participation of seniors, caregivers, and providers in the products' design and development cycle.

Most thought-leaders emphasized the need to both identify and learn from the "best practices" selected from among already ongoing efforts, as well as the need to continue to plan and execute additional outcome-oriented field pilots and larger-scale demonstration projects. Paramount is the need to target new discovery efforts towards the creation and quantification of sustainable value from a multi-stakeholder perspective. That perspective includes a need to involve those who must fit the bill for "Aging in Place" technologies, with a goal to quantify the technology's value and demonstrate economic

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and non-economic benefits. Cost-effectiveness evidence was considered key for the emergence of innovative business and operating models, and for driving changes in reimbursement policies.

Moreover, the need to raise awareness through “trusted agents”, effective advocacy campaigns and other convening strategies to emphasize the potential value of “Aging in Place” technologies were recurring themes in the responses of the interviewees.

Finally, raising awareness of the interdependencies of organizational, economic and infrastructural requirements of these approaches, and giving potential providers of these services a reliable way to “just get started” in the planning and implementation of initial efforts was viewed as essential. Several interviewees suggested that the development and distribution of educational orientation material, planning and implementation guides and tools, and evaluation frameworks could accelerate the adoption and effective use of IT-enabled strategies for aging-services.

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**Jeff Rideout**, Chief Medical Officer, Health Evolution Partners

**Andrew Sixsmith**, Professor and Director, Gerontology Research Centre, Simon Fraser University at Harbour Centre

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**About Blue Shield of California Foundation:**

# blue shield of california foundation

An Independent Licensee  
of the Blue Shield Association

Blue Shield of California Foundation is committed to making health care effective, safe and accessible for all Californians, particularly underserved people, and to ending domestic violence.

**Goals:**

- Universal health coverage for all Californians
- Health care that is effective, safe, affordable and accessible
- Domestic violence prevention

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## ABOUT CAST

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The Center for Aging Services Technologies (CAST) is leading the charge to expedite the development, evaluation and adoption of emerging technologies that will transform the aging experience.

### **CAST four focus areas:**

1. Driving a global vision of how technologies can improve the quality of life for seniors while reducing health care costs;
2. Accelerating technology research and development through pilot evaluations with seniors;
3. Advocating to remove barriers to the rapid commercialization of proven solutions; and
4. Promoting dialogue about standards to ensure interoperability and widespread access to aging-services technologies.

CAST is now an international coalition of more than 400 technology companies, aging-services organizations, businesses, research universities and government representatives working together under the auspices of the American Association of Homes and Services for the Aging ([www.aahsa.org](http://www.aahsa.org)). The members of AAHSA help millions of individuals and their families every day through mission-driven, not-for-profit organizations dedicated to providing the services that people need, when they need them, in the place they call home.

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## CONTACT CAST

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Majd Alwan, Ph.D, Director  
(202) 508-9463  
[malwan@agingtech.org](mailto:malwan@agingtech.org)

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Washington, DC 20008-1520  
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Phone (202) 508-9463  
Fax (202) 220-0032