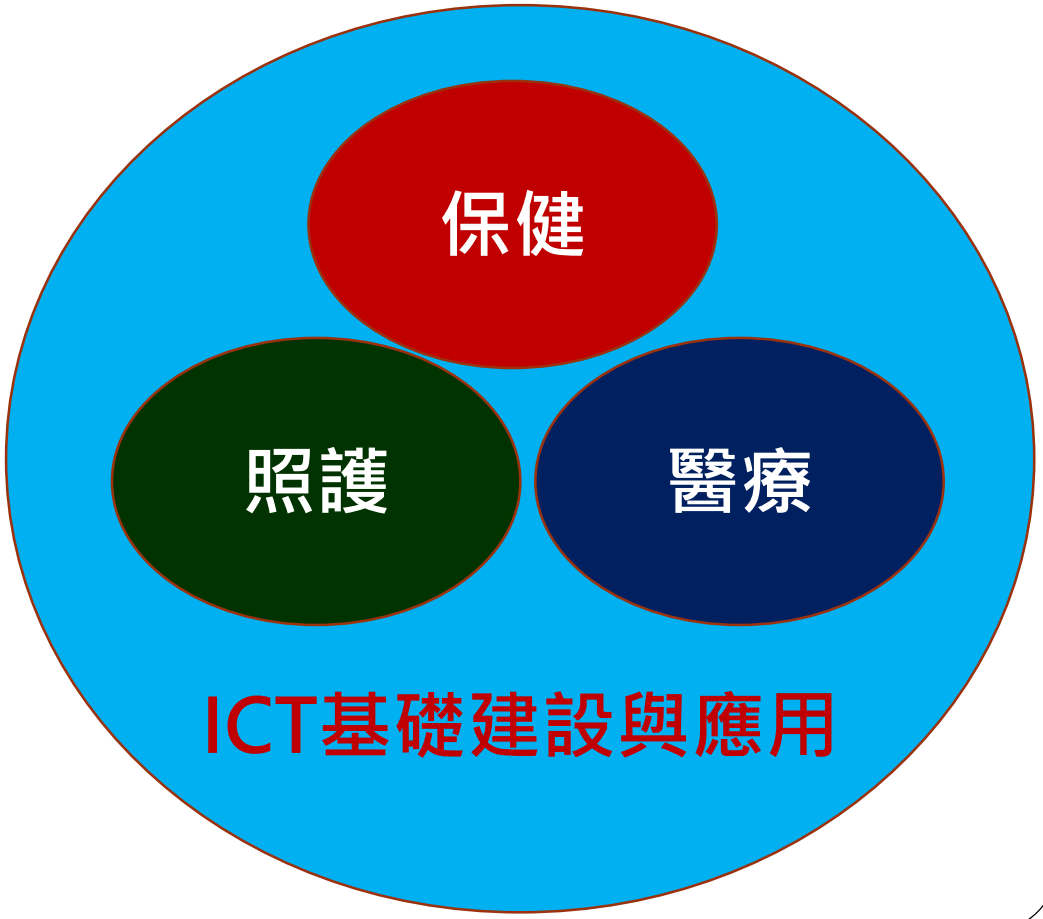
長期照護制度與智慧生活

科技會報辦公室

智慧生活的願景：健康構面

- 塑造全方位的健康優質生活
  - 平時：全時保健
  - 病時：個人化醫療
  - 年長：長期照護
- 塑造 ICT 智慧應用的國際標竿



長期照護制度的基礎

- 法規與機制
- 基礎建設
- 商業營運環境

環境

人力

- 本勞、外勞
- 基本專業訓練
- 醫療體系
  配合人力

技術

知識

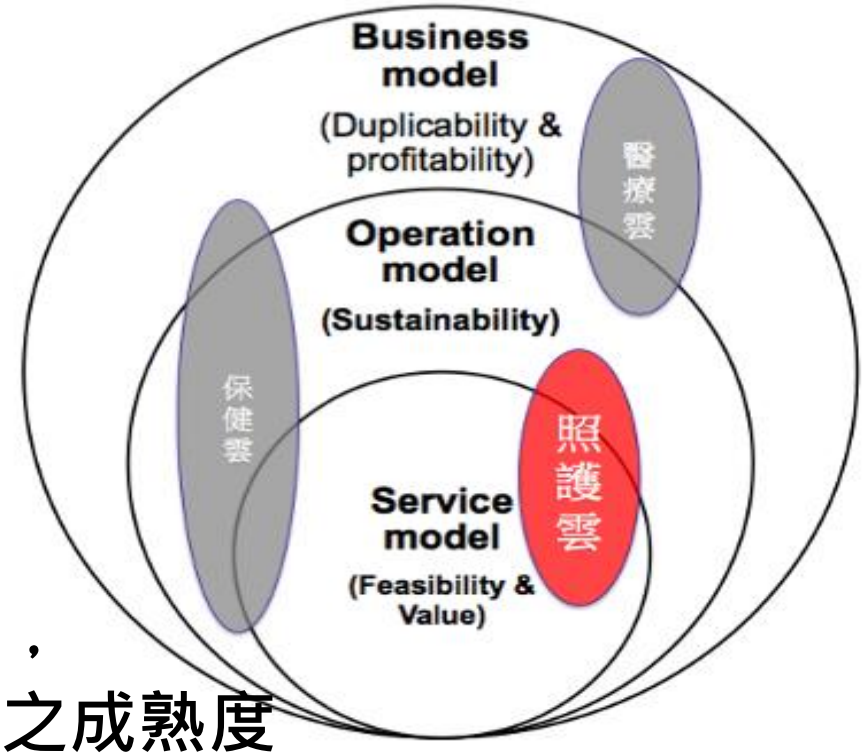
- 跨域技術
  （ICT結合醫療）
- 高親和度的
  醫材設備

- 對象：民眾與照護人員
- 醫療保健普及教育
- 設備應用能力

醫療、保健、照護雲成熟度

- 醫療、保健、照護都需仰賴雲端架構
  - 衛生署已經開始推動雲端服務（五項），進展不一

- Maturity Model
  - Service
    → Operation
    → Business



- 保健、照護可以降低醫療成本，應考慮由健保費用負擔基本服務，才能扶植保健、照護雲之成熟度

主要內容

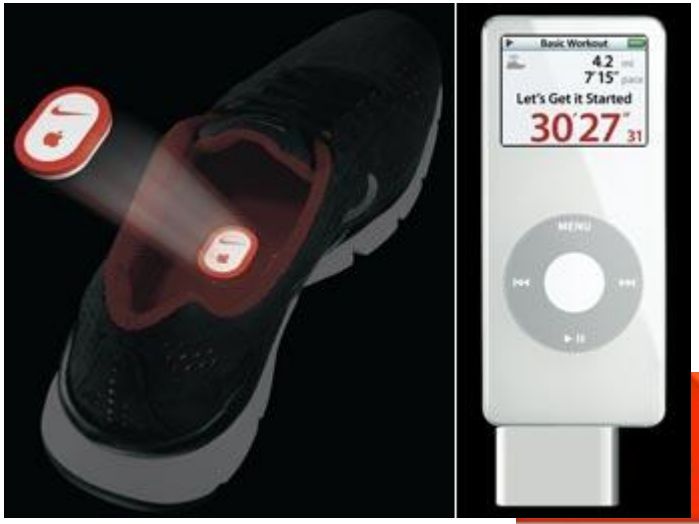
醫療雲

- 醫院資訊系統雲端化
  - 標準化
  - 模組化
- 全國電子病歷系統與病歷交換
  - 500家醫院
  - 20000家診所

保健雲

- 最多 Innovation 空間
  - 結合 Social Networking
  - e.g. 結合gym, wellness, travel, sports and food industry
- 與電子業製造業結合潛力

保健雲商品化實例



Nike+ and iPhone, iPod

德國的動向-研究與發展

- **Ambient Assisted Living (AAL)資訊通訊技術**
- **初期發展：**
  - **機器人ARTOS：**藉由雷達測距儀、超音波感應等感應設備調整焦點與焦距的相機，可紀錄家中狀況，自動分析實施對象的狀況，分辨出緊急狀況時會自動發出警報。
  - **機器人OxiSENS：**透過信號的處理，可測得動脈之SpO_2值、心跳等數值。
  - **RespiSHIRT：**將呼吸監控系統組合在T-shirt或嬰幼兒服裝上，所得之資訊可無線傳送至智慧型手機。
- **相互運用：**藉由配置於實施對象身邊多重的感應設備所獲取的資訊，得以整合性地判斷其健康狀態。

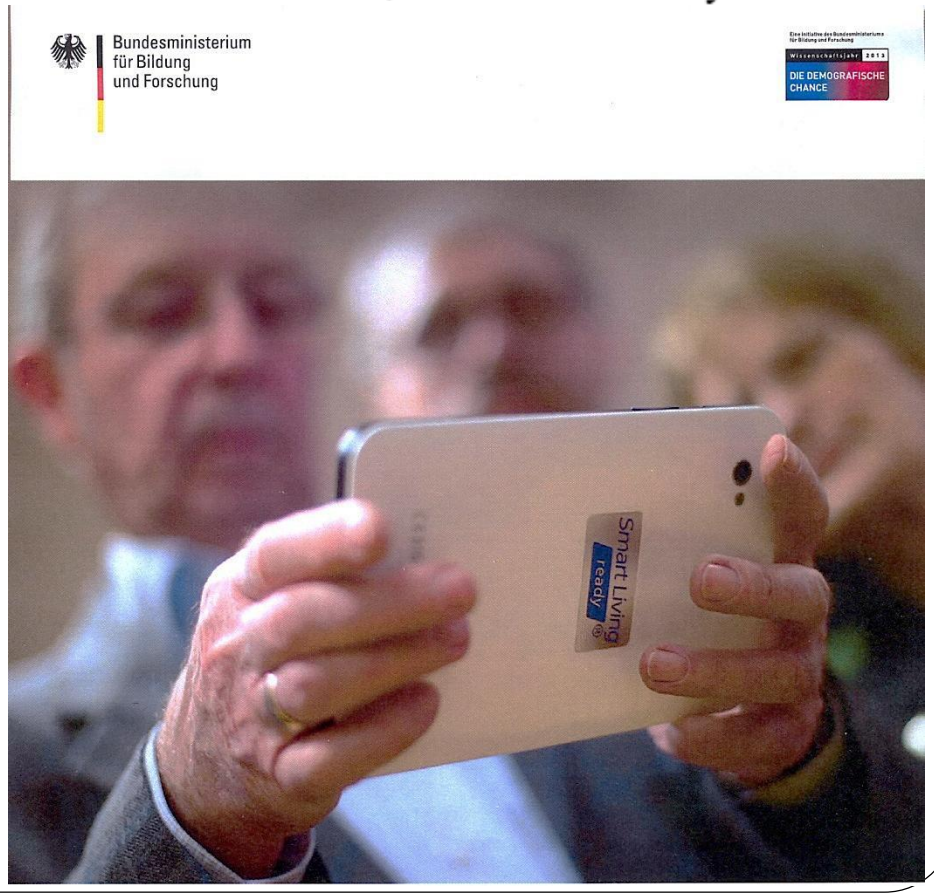
What is Ambient Assisted Living?

Ambient assisted living (AAL) is the use of information and communication technologies (ICT) in a person's daily living and working environment to enable individuals to stay active longer, remain socially connected and live independently into old age.

ICT for independent living can be as simple as an alarm button or a reminder to take medication. It may also be very sophisticated such as a system that can predict when an older person is at risk of falling (a major cause of loss of personal independence). The box "Technology for users" gives examples of ICT for independent living. Whether simple or sophisticated, the philosophy of ambient intelligence is that the technology is at the service of the user, not the other way around.

As part of its overall action plan, Ageing Well in the Information Society[3], the Commission is supporting a new Ambient Assisted Living (AAL) joint research programme of Member States. Since 2008, this programme is joining together national research activities in the area and is complementing EU-funded activities within the seventh European Research Framework Programme (FP7)[4].

Between 2008 and 2013, the EU and Member States, and the private sector will have invested more than €1 billion in research and innovation for ageing well: some €600M in the Ambient Assisted Living Joint Programme, an expected €400M in the EU's latest research framework programme and so far more than €50M on large scale pilot projects in the EU's ICT Policy Support Programme[5].



Examples of products and services for ageing well in the Information Society

ICT can be used in many ways to help older people continue to live independently and to play a full part in work and society.

Social communication – ICT offers easy access to phone and video conversations, especially by broadband, to stay in touch with family and friends and helps overcome social isolation. In many countries over half the over 65s live alone.

Daily shopping, travel, social life, public services – Internet technologies already provide the means to shop from home and many public services are accessible on-line.

Daily Living, safety and security – Smart house technology and devices can ensure doors and windows are locked at night or when leaving the house, monitor for water or gas leaks and turn off unwanted lights. Automatic alarms can summon help when required.

Reminders – Memory problems tend to increase with age so help may be needed to make sure that medication is taken at the right times and that household tasks are not forgotten.

Mobility – Combined with GPS and sensors for vital sign monitoring, mobile solutions can offer assistance for navigation and provide access to alarm services, in the event of accidents or failing vital signs

User-friendly interfaces – All sorts of equipment in the home and outside can be adapted for users with impaired vision, hearing, mobility or dexterity.

Telemedicine – The use of ICT for health care opens up new opportunities for looking after patients at home. The many new developments include ways of monitoring well-being and providing a secure home environment.

Personal health systems – Wearable and portable devices can be used for monitoring, diagnosis, therapy and restoring functionality. They can assist with treatment of individuals with chronic disease and avoid the need for hospitalisation.

Future developments will make use of emerging technologies such as robotics, new materials and biosensors. The concept of ambient intelligence promises that the whole environment – both at home and in the wider world – has embedded intelligence to help meet the needs of everyday life.

美國的動向-企業的行動

- **IBM**：於義大利實施的Bolzano計畫，進行日常生活的遠距監看計畫。例如，環境感應器能感應室內的CO_2濃度，若高於正常值則送出警報。
- **Intel**：保健計畫。醫療從業人員可隨時掌握實施對象個人與家庭的狀況，透過更確實的情報作出判斷，以實現年長者的生活習慣病的預防，慢性病患的管理。
- **Continua Health Alliance**：由Intel等高科技企業與保健企業結盟，目標促進家庭保健(Home Health Care)的普及。透過健康、醫療設備系統化的連結，以提升個人保健的品質。
- **Qualcomm**：在家測得之血糖值資料能自動送到遠距健康管理中心。

日本的動向-獨立生活支援服務(1)

- **無所不在的網路機器人服務**，透過多地點、不同型態的機器人連結合作，以提供更多面向的服務。

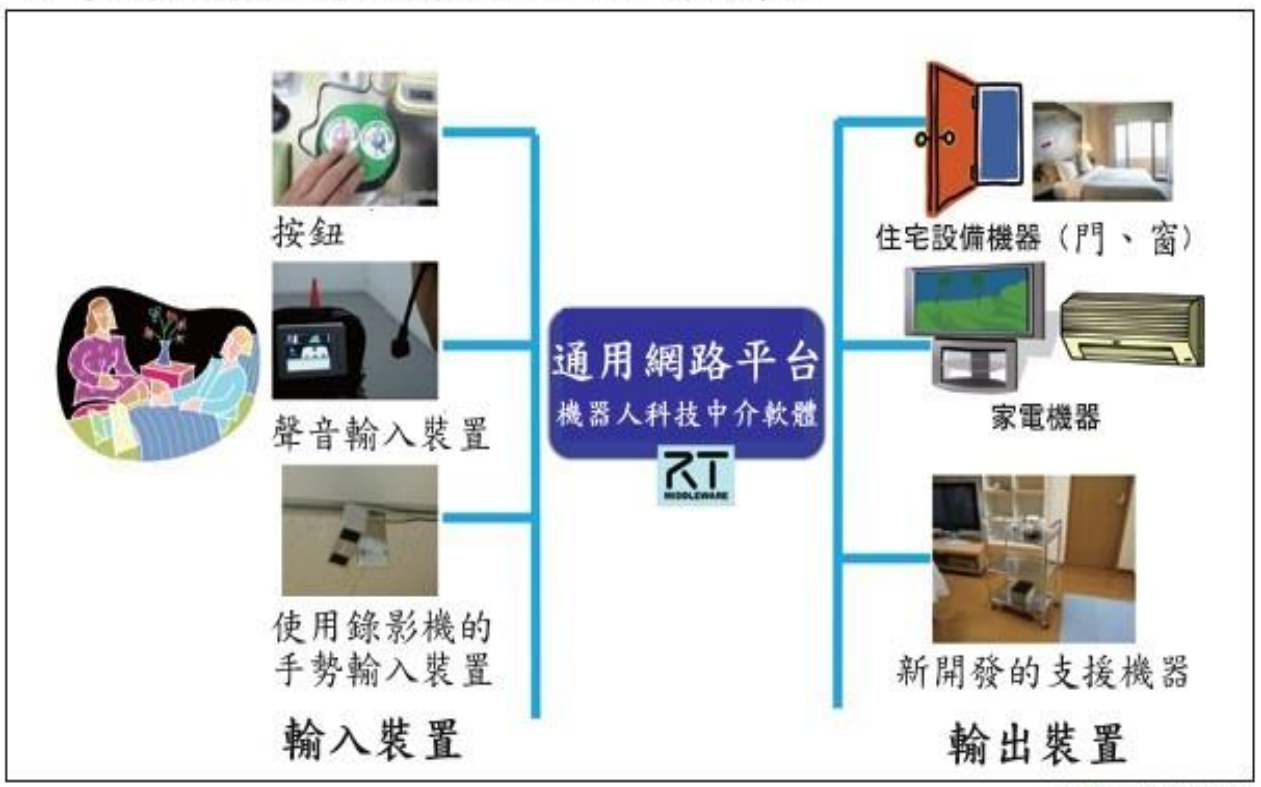
圖 三型態的機器人相互合作提供獨立生活支援服務示意圖

出典：參考資料[7]

日本的動向-獨立生活支援服務(2)

- **Smart House:** 透過通用網路平台進行中介，在非特定輸出輸入裝置的狀況下，進行指令的傳送。

圖 透過機器人科技中介軟體所連結的smart house輸出入裝置

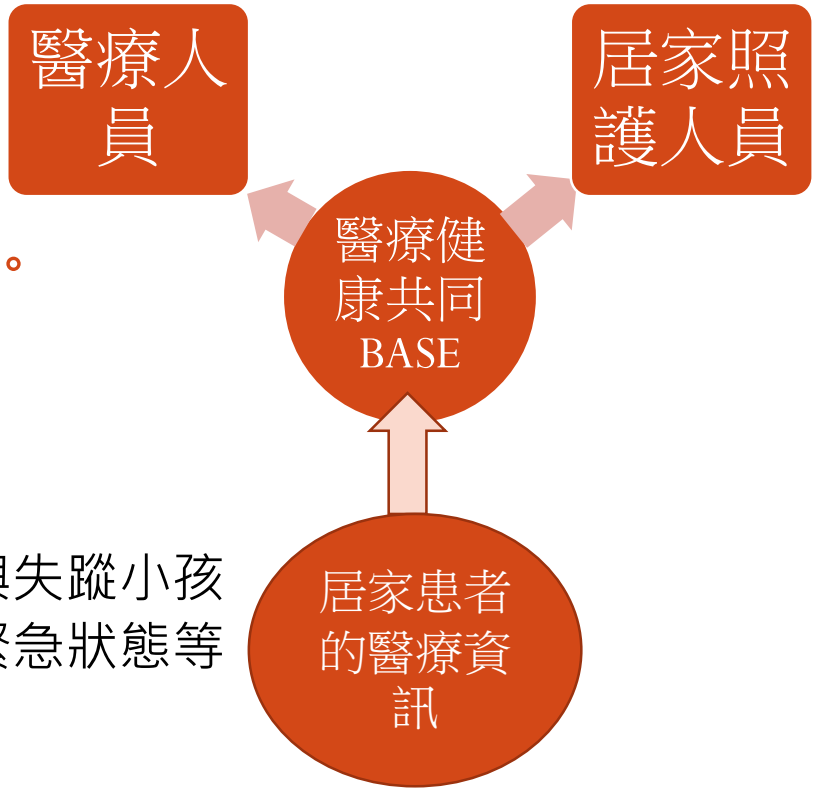


出典：參考資料[8]

日本的動向-獨立生活支援服務(3)

- **居家醫療的措施**
- 2012年起，NTT集團在千葉縣龜田綜合醫院的協助下，進行遠距醫療共同實證實驗。自動收集居家患者的醫療資訊傳送至雲端，醫療人員可透過網路醫療病歷，直接對居家患者進行遠距治療。

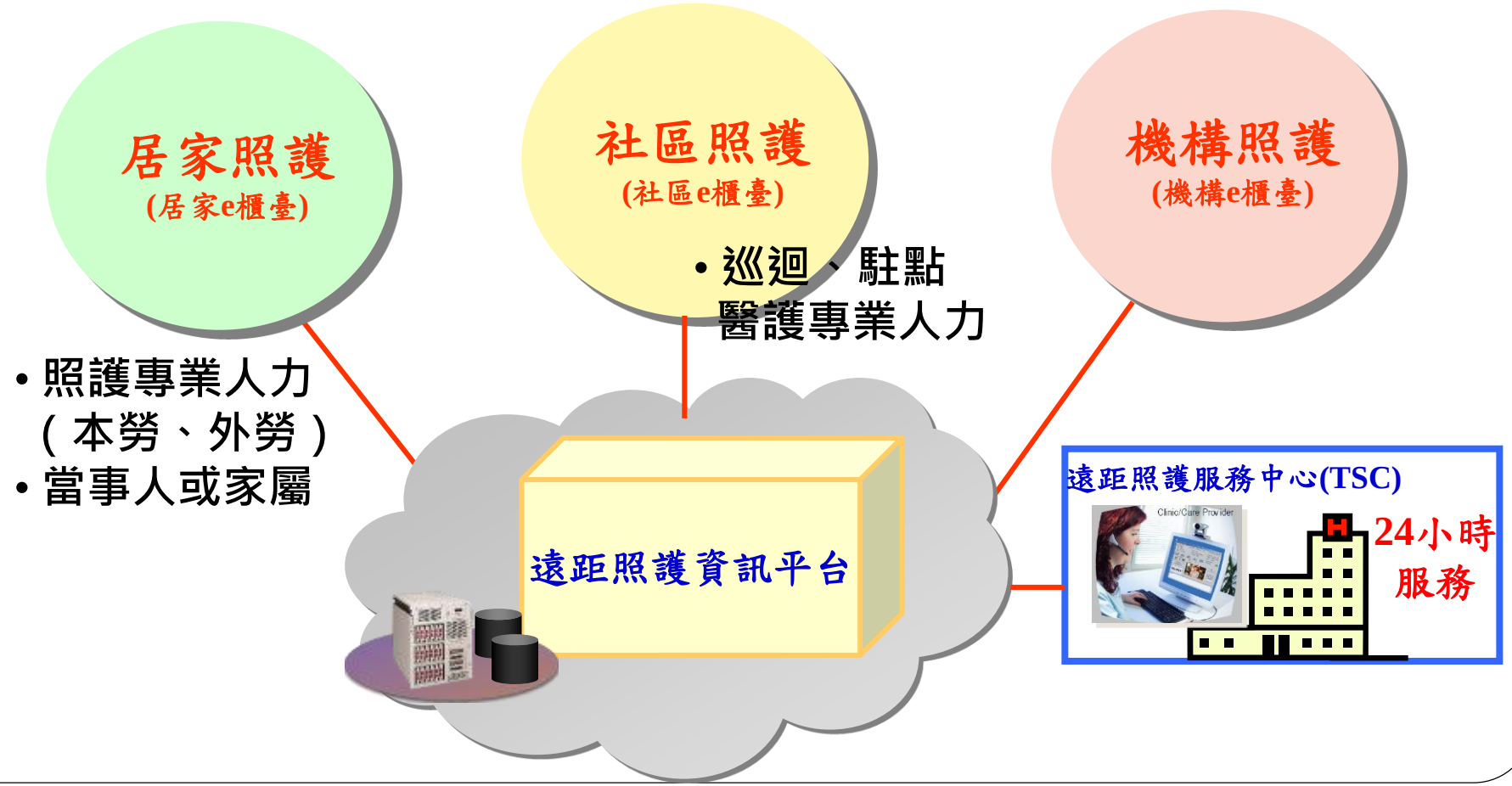
期待未來能實現居家醫療以及訪問照護的整合性照護價值鏈。



- **監護服務的提供**
  - 緊急通報系統
  - 手機網路定位系統：迷途老人與失蹤小孩
  - 居家安全系統：火災、瓦斯、緊急狀態等

照護雲服務架構

- 以遠距醫療、照護資訊平台串連各種服務系統與資源，建立整合式照護服務



照護雲推動方式 (I)

- 環境面
  - 建立長期照護保險相關法規（興利為主、管制為輔）
  - 健保涵蓋基本服務，帶動產業萌芽
    （盤點有助於降低醫療需求的照護項目，酌予補助）
  - 扶植照護服務營運模式、產業（推動初期酌予補助）
  - 基礎建設寬頻到戶

- 技術面
  - 盤點照護需求，資助大宗照護需求之設備研發
  - 強調跨域整合、使用親和度

照護雲推動方式 (II)

- 人力面
  - 本勞、外勞管理制度（計時外勞已啟動）
  - 專業訓練：醫療、資通訊應用
  - 社區照護點的人力支援（鼓勵社區與鄰近醫院的結合，如秀傳與線西鄉）

- 知識面
  - 對象：照護人員、被照護人及家屬
  - 保健醫療常識、設備運用知識
  - 方便的線上查詢（搜尋）、中文化的科普文字
  - 個人化的資訊解說（結合個人病歷，資訊轉換）