



# **The impact of technology: innovation to help patients**

Patient experience as innovation driver  
in healthcare technologies

Felip MIRALLES  
Manager Unit eHealth  
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## Eurecat technology centre

Eurecat is the result of a merge, last year 2015, from Ascamm, Barcelona Media, BDigital, Cetemmsa, CTM y CTNS.



# eurecat – eHealth unit

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## Personalised medicine

- **Clinical Decision Support systems** for early diagnosis, patient stratification, prognosis and therapy management
- **Simulation of predictive models** linked to clinical data, omics data, lifestyle and environmental data
- **Data analytics** and anomaly recognition

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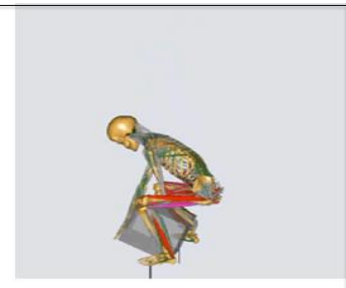
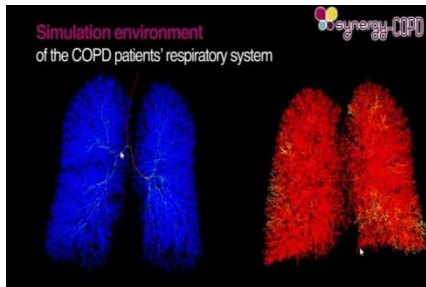
## Integrated care

- **mHealth** for self-management, patient empowerment
- **Tele assistance, tele health, tele monitoring**
- **Adaptive case management.**
- **Assistive technologies** for people with special needs (the elderly, the disabled,...)

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## Biomechanics

- **Gait and Motion analysis**
- **Musculoskeletal Modeling** and **Inverse Dynamics**
- **Medical and Occupational Health protocols** design
- Integration of Hardware into a **personalized software**



# The impact of technology in patient experience

- The application of technology, even costly technology, **does not necessarily** improves patient outcomes, engagement, and experience.
  - Technology is only a facilitator, a means
- How to get **people involved in their own health?**
  - Technology alone is **not** the answer.
  - Most current Patient Portals have not been designed to focus on patient engagement, they are rather focused on information sharing than on facilitating **information exchange**.



# Engaging patients with a 360° approach

**360° approach:** to reach and engage patients along their care journey through many-ways communication and collaboration tools.



Source: [www.datstat.com](http://www.datstat.com)

1. **Longitudinal data collection for** ongoing monitoring
2. **Passive data capture** through IoT for objective continuous monitoring
3. **Patient portals for** two-way communication and self-management
4. **Data aggregation and analytics** for Real-Time Shared decision support
5. **Dashboards and management tools** to trigger collaborative actions and improvements

# 1. Longitudinal data collection

- **Surveys** to capture patient experience, with findings highlighting issues to be addressed from the patient's perspective
  - E.g. coordination of care, pain management, respect for preferences, etc.
  - Health care has not yet fully embraced using patient feedback as a driver of quality improvement





## 2. Continuous data capture

- Many different applications, sensors, wearables, and mobile apps and Internet of Things devices continuously capture patient's data
  - Information is often too generalized or is too specific.
  - They address part of the patient's continuum but few have been adopted to encompass the entire continuum of care.



### 3. Patient portals for self-management and engagement

- New technologies on the rise aim at making the patient experience as **engaging** and **educational** as possible, to help keep patient populations out of the hospital:
  - **Self-management tools** to understand what makes them sick, how to stay healthy, and what to do if their conditions get worse.
  - **Two way communication tools** (web, mobile, social) to be active participants in their care by asking questions, knowing their medical history, and learning about care
  - True information **exchange** and **personalizing** information based on patient's demographic, disease, co-morbid conditions and personal preferences
  - Planned, managed and measured experiences across the **whole patient's care continuum** result in better patient satisfaction.





## 4. Data analytics for decision support

- From diagnostic care to **predictive medicine**, expanding patient continuum to include prevention, wellness and lifestyle changes as well disease management:
  - **Predictive analytics** provides accurate picture of present and prediction of future trends.
  - **Prescriptive analytics** include evidence, recommendations and actions for what the patient needs to do next in the continuum of care.
- As the analytic IT tools of healthcare organizations expand to become more predictive, the resultant **proactive decision making** will enable them to better meet the **needs** of patients and effectively meet their **expectations**.

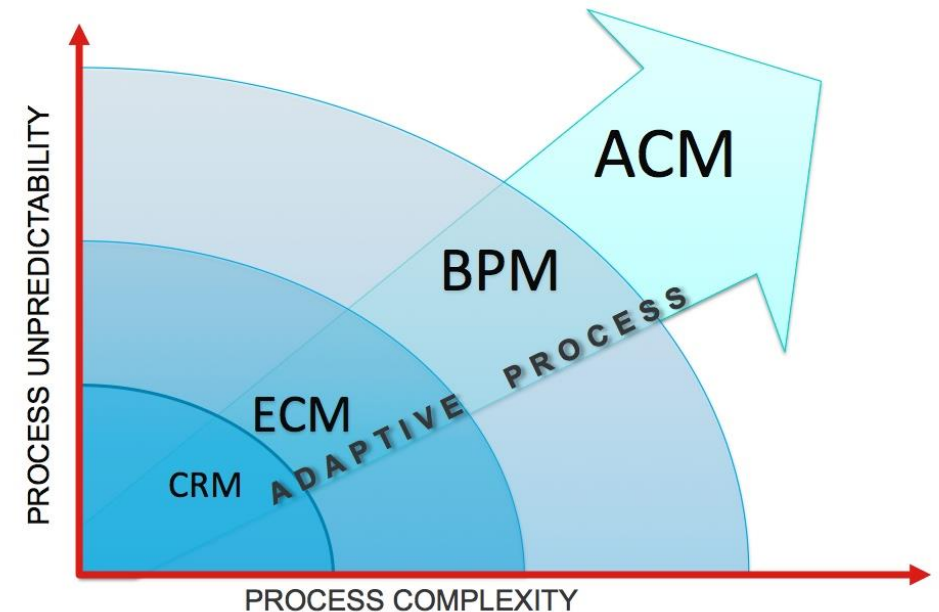
### Automatic intelligent solutions

- Data mining
- Pattern recognition
- Supervised classifiers
- Text categorization
- Clustering
- Statistics



## 5. Dashboards and collaborative management tools

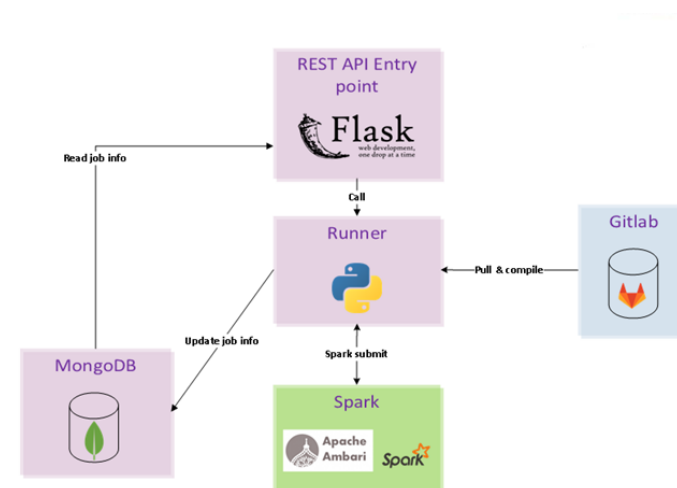
- **Healthcare dashboards** are critical for all actors who need quick and insightful **answers to their questions, recommendations for improvement** and **calls to decision making** in an easy-to-understand visual format.
- Professionals in every healthcare tier and level, social workers, patients and caregivers: they need **collaborative and adaptive case management** tools to share data and processes and effectively partner across the whole patient journey.





# Health Forecast – Big Data analytics

- Integrated analysis of **clinical**, **environmental**, and **genomic** Data using Machine Learning techniques to **predict risks** of Complex Multifactor Illnesses
- **Big Data platform** to facilitate analysis of highly multidimensional data as well as develop predictive services to study and support the prognosis of illnesses to **bio researchers, clinical practitioners** and **patients**
- Two ongoing studies: patients with **diabetis** (type-II) and comorbidities; and patients with **lung cancer**

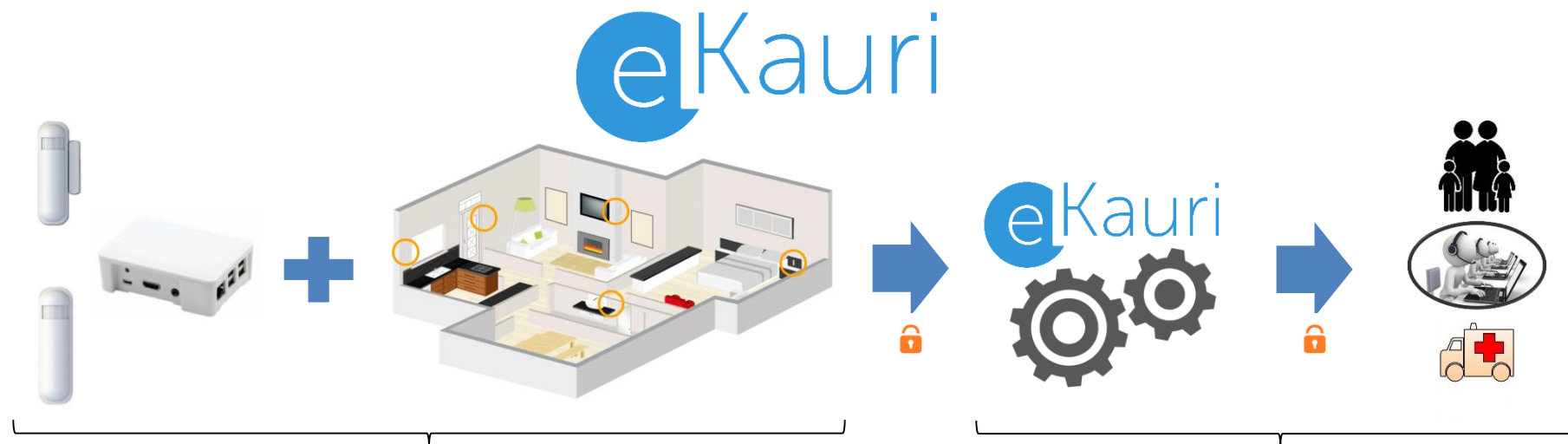




# From co-design to user acceptance to product

**SAAPHO** – Secure Active Aging: Participation and Health for the Old





Teleassistance of 3rd generation to promote autonomy, safety and wellness for the elderly





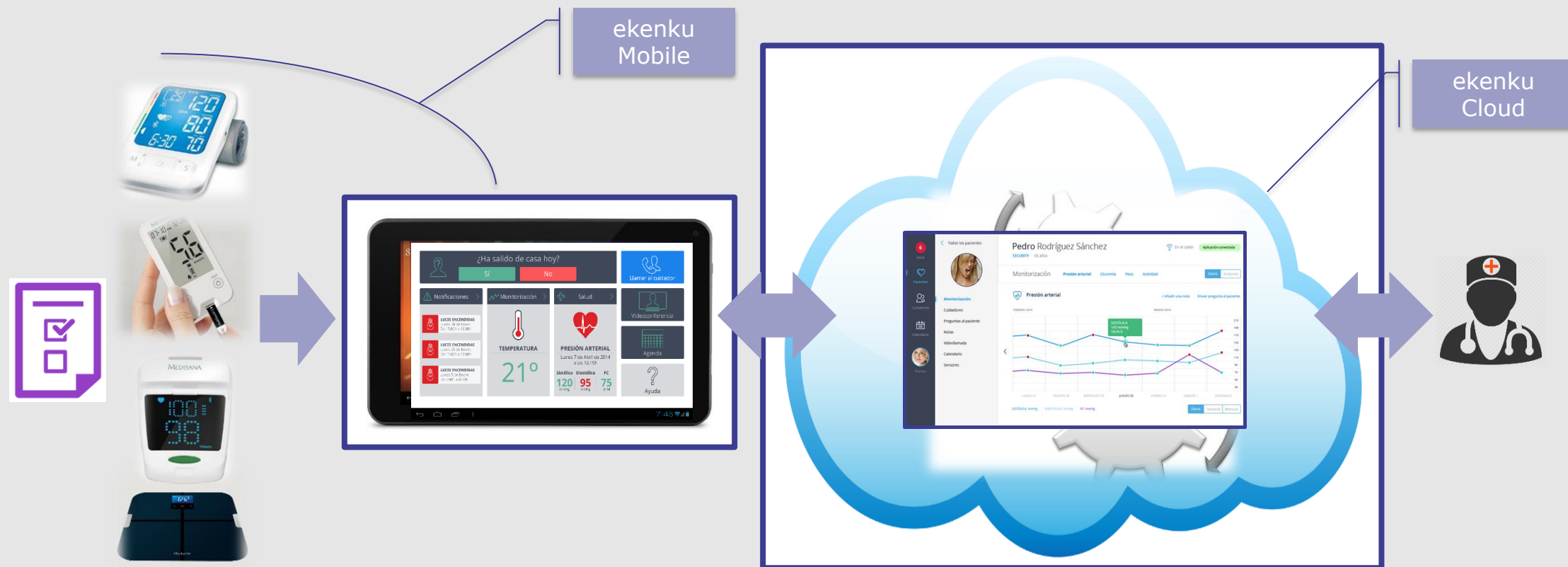


## Safety + autonomy + wellness

- *Peace of mind and safety for relatives and caregivers:  
Check at any time how is your patient doing  
Get alerts upon potential anomalous situations*
- *Enable social inclusión and healthy habits*
- *Enhance user autonomy  
Increase time to enjoy life  
Decrease the need for follow-up trips*



# Solution for remote professional management of patients at their own home



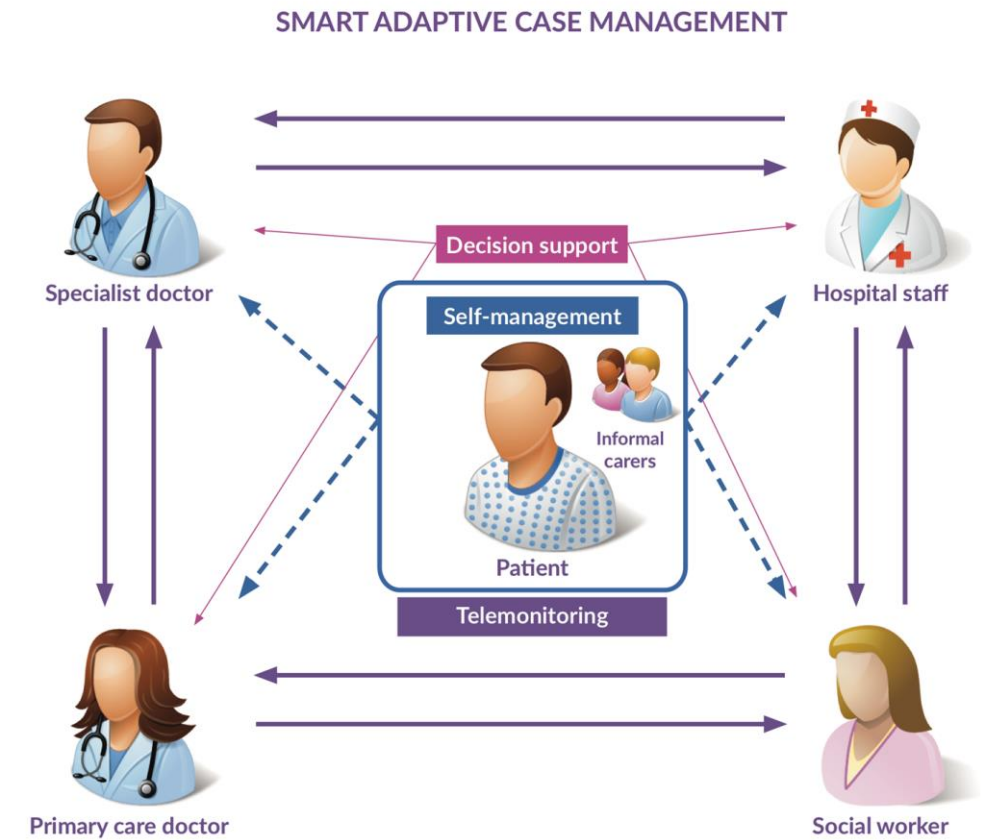
# Benefits for patients

- Prediction of exacerbations and proactive interventions.
- Reduction of hospital stays and follow-up trips.
- Real-time remote support.
- Better adherence to treatments.
- Better healthcare outcomes.

The collage displays several screens from a mobile health application:

- Notificaciones (Notifications):** A list of recent health events, including blood pressure readings and questionnaire prompts.
- Presión Arterial (Blood Pressure):** A screen showing a large heart icon, the title 'Presión Arterial', and a timestamp 'Hace 38 minutos, 11:14'. Below, it displays three metrics: Systólica (62 mmHg), Diastólica (120 mmHg), and FC (43 BPM).
- Peso (Weight):** A screen showing a large scale icon, the title 'Peso', and a timestamp '3 de sept., 10:05'. It displays a weight of 20,5 Kg.
- Agenda:** A calendar icon with the label 'Agenda'.
- Configuración (Settings):** A gear icon with the label 'Configuración'.
- Cuestionario (Questionnaire):** A screen titled 'Cuestionario' with the question 'Ha dormido bien?' (Did you sleep well?). It has two buttons: 'No' (red) and 'Si' (green).
- Nueva medida de presión arterial (New blood pressure measurement):** A screen titled 'Nueva medida de presión arterial' with a heart icon and the title 'Presión Arterial'. It shows a timestamp 'Hace 0 minutos, 11:14' and the same three metrics as the main BP screen: Systólica (62 mmHg), Diastólica (120 mmHg), and FC (43 BPM). It has two buttons: 'Descartar' (red) and 'Confirmar' (green).
- Videoconferencia (Videoconference):** A screen showing a video call with a woman. It includes icons for camera, microphone, and video, and a 'Finalizar' (End) button.

# Connecare - Integrated care for chronic patients



# Patient experience as innovation driver in healthcare technologies -> Measurable outcomes

- How can technology enable a **positive Return Of Investment** to a patients' perception of their care?
- Which technologies will likely influence the patients' experience and ultimately **rate the healthcare organization high**?
- How do companies and healthcare providers **measure and predict** the impact to the patient experience when developing a new technology or process?



Source: [www.bfwh.nhs.uk](http://www.bfwh.nhs.uk)



**Moltes gràcies!**  
**¡Muchas gracias!**  
**Thank you!**  
**Merci!**

[felip.miralles@eurecat.org](mailto:felip.miralles@eurecat.org)