Utilisation of a centralised customer management solution with AI-based predictive analytics to improve home-care operations in an integrated social and healthcare organisation

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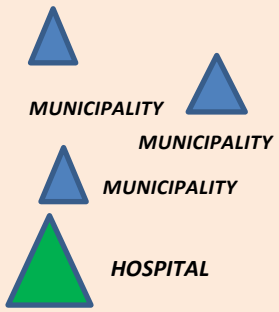
Strategic Background of AI-based Solutions in Home Care

Development of service integration

Added value comes from data

Hierarchies

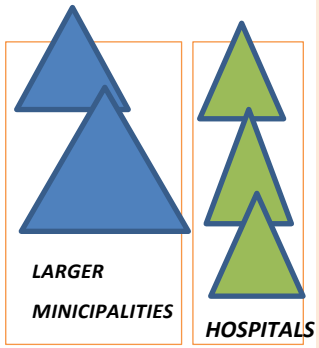


Added value comes from hierarchies

Focused on organization and professionals

Based on different municipalities

Economy of scales

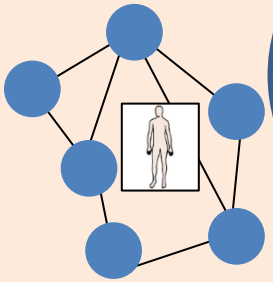


Added value comes from economy of scales

Focused on organization and professionals

Contract based co-operation

Integration



Added value comes from the data

Focused on citizens

Structural integration

Ecosystem

eksote

Service providers

Biobanks

HELSINGIN BIOPANKKI
HELSINGFORS BIOBANK
HELSINKI BIOBANK

VERO SKATT Taxation

Kela

TE-palvelut
tjänster | services
Unemployment

Social insurance
Social benefits

Added value comes from data analyzing and Artificial Intelligence

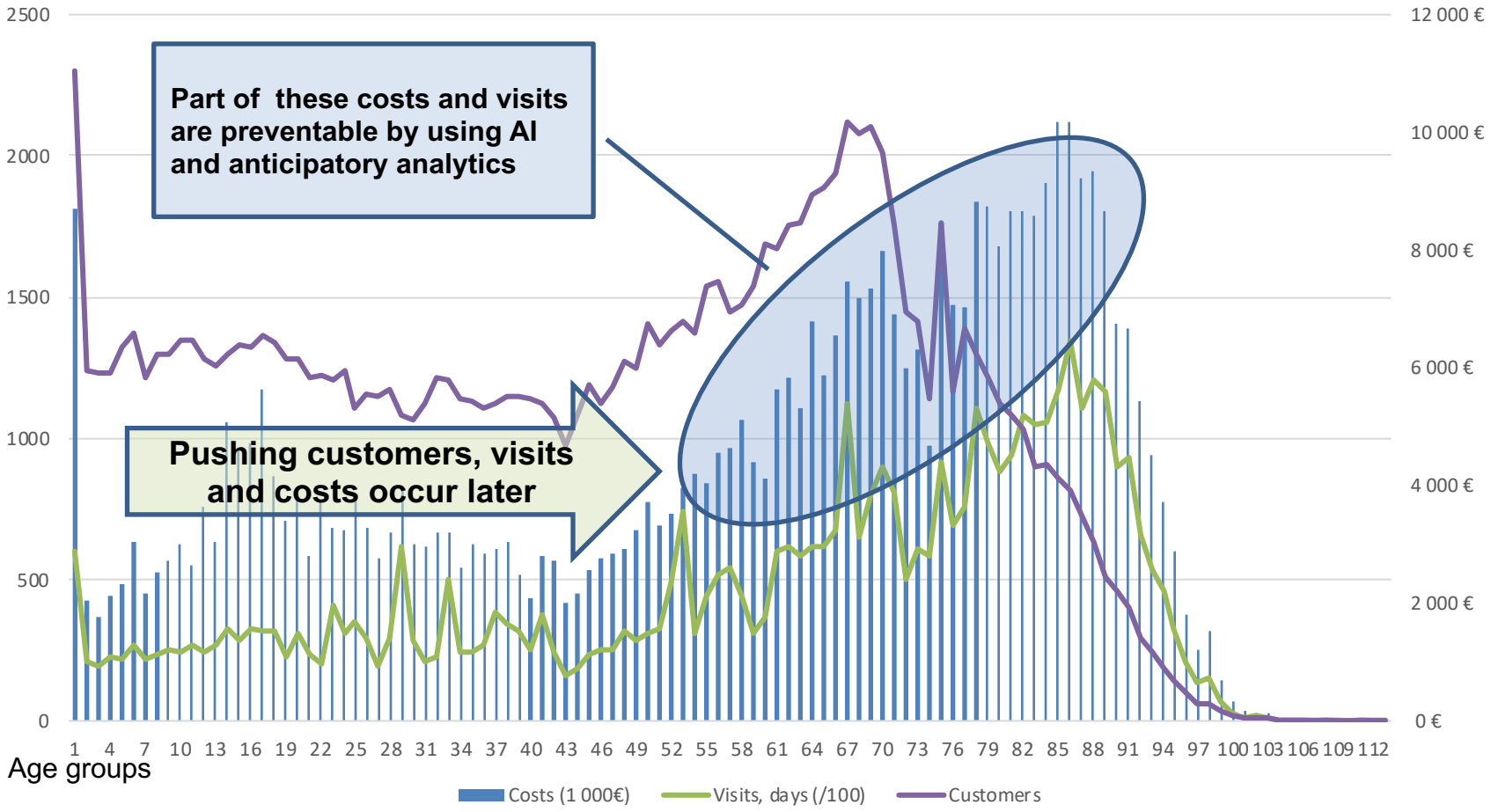
Orchestrate large ecosystems by AI

Focused on citizens and common data.

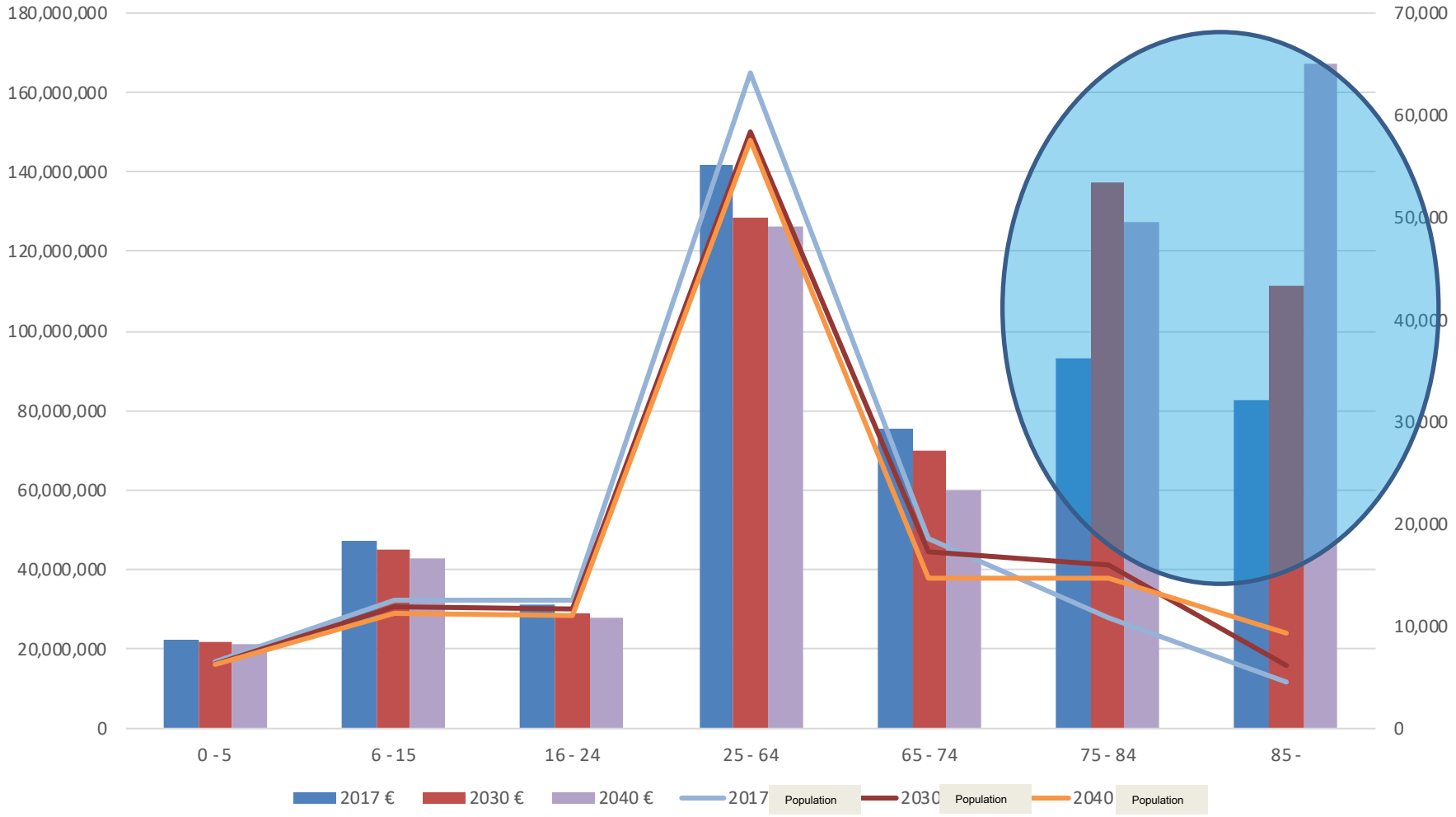
Autonomy of work

Autonomy of the workers and citizens

Common challenge in most countries



The development of costs and population change in South Karelia during 2017-2040

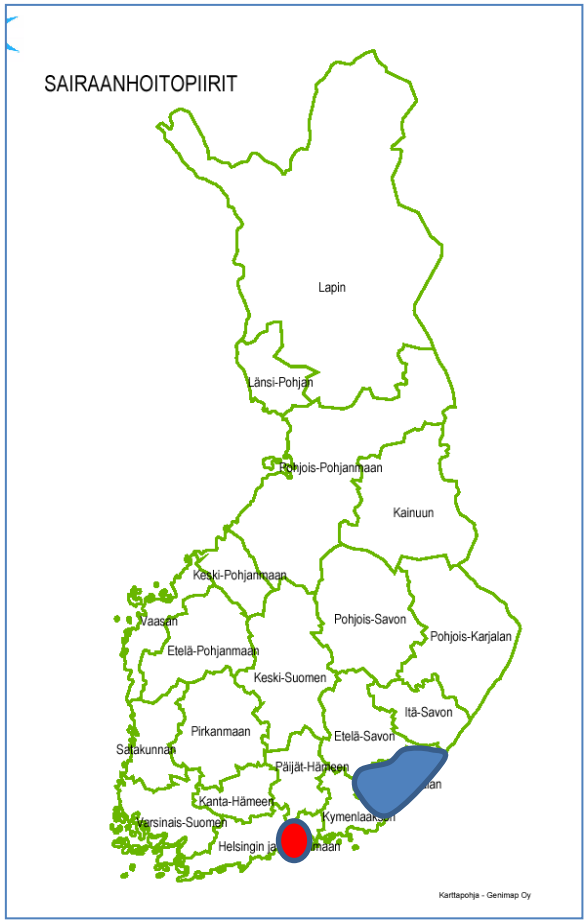


Why the new regional model Eksote was made

- Traditional arguments :
  - Integration between the acute hospital, primary care and social well-being services means a new and better balance between primary care, social services, services for elderly people and hospital;
  - Better coordination in strategy, financing, ICT and investments
  - Common use and recruit of staff
  - Share the resources in a new way.

- Arguments that we have learned:
  - Future challenges and the strategic edge is the population development and as a result to support home care;
  - Added value comes from data; Browse the data and develop data analyzing;
  - Artificial Intelligence, robotics, machine learning;
  - Only those patients go to the hospital who really benefit the hospital care. The largest cost savings resulting the fact that hospitals will have fewer patients.

The South Karelia Social and Healthcare District



Integrated and responsible for the whole Social and Health Care in the South Karelia Region.

The role is to coordinate and provide. Municipalities are responsible of the financing.

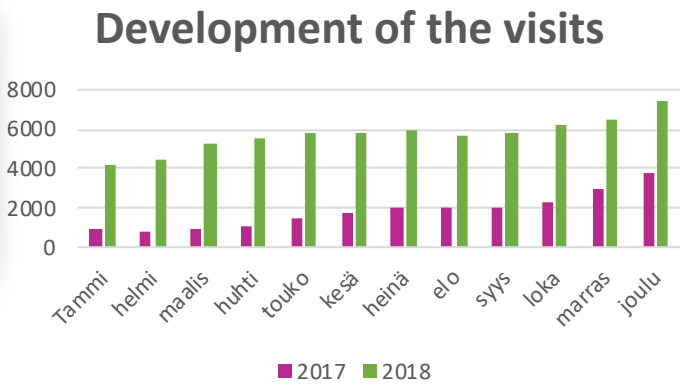
Population	**130.000**
Budget	**520 M€**
Workers	**5600**

One acute hospital

Nine welfare centres in municipalities

Artificial intelligence in home care in South Karelia

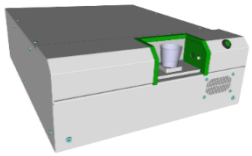
Homecare virtual visits



Implemented remote visits 2018
68 400 kpl
Pilot customers 250

Savings 500€ /month/customer

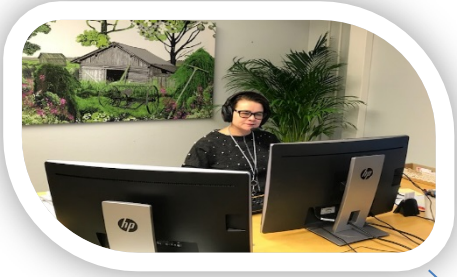
Medicine robot



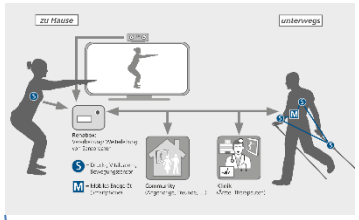
60 testing customers

Savings 400€/month/customer

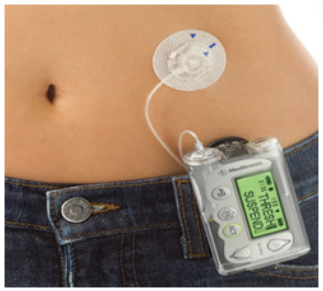
Autonomy in homecare nursing



Virtual visits

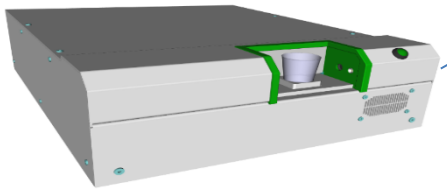


Tele rehabilitation



Intelligent insulin pumping

AI



List of addresses. The nurse can plan the working day autonomously

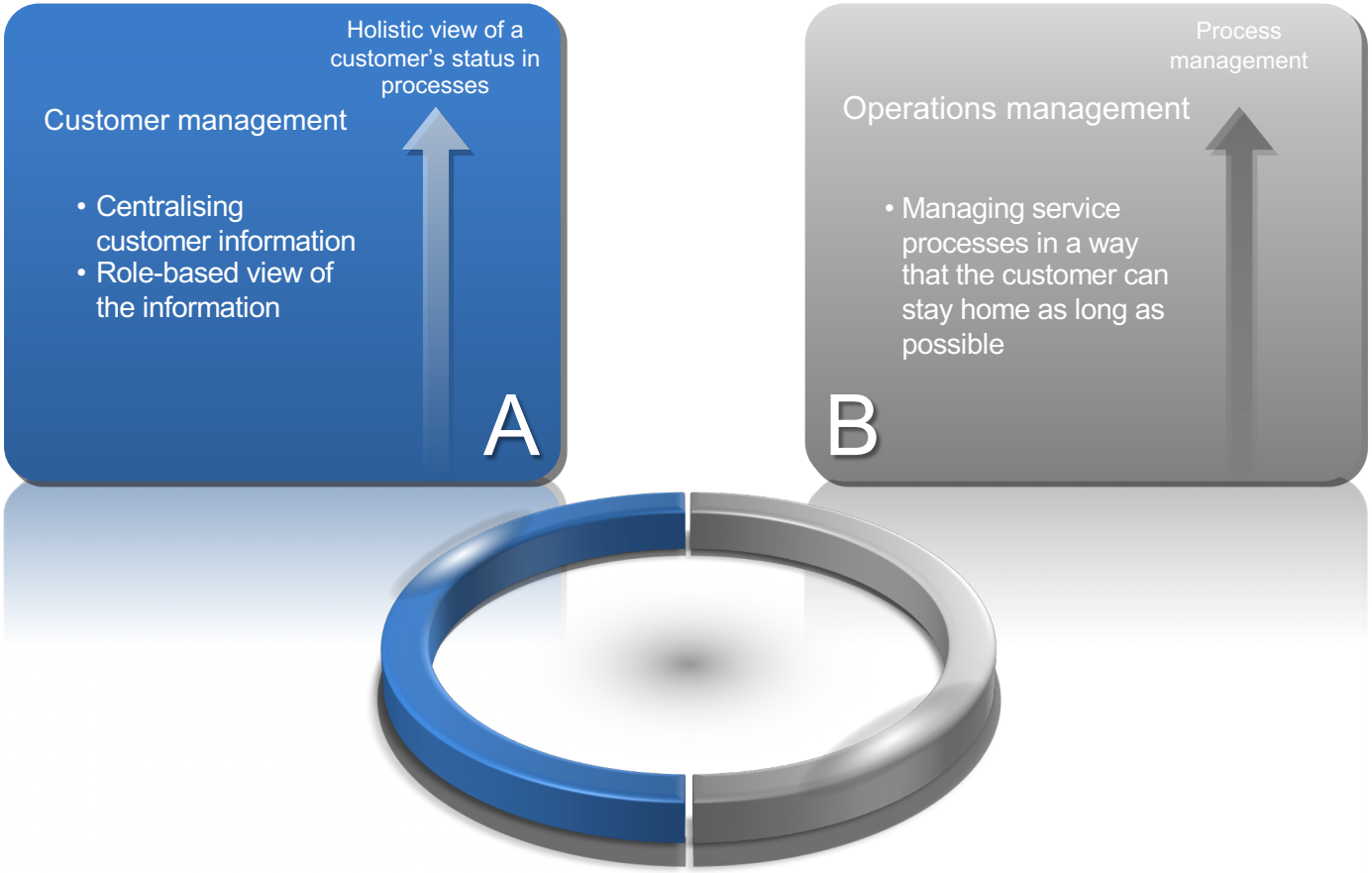
Hospitals have taken the ancient role of the castles. They are the centers of their own region. The lord of the castle is planning expansion and new parts of the castle. But what happened to castles when the humble subjects became more independent and autonomous? So many empty castles. Is the fate and the future of hospitals similar to castles?

Improving Eksote's centralised customer management with AI-based solutions

Focus on CDSS-solutions since 2010

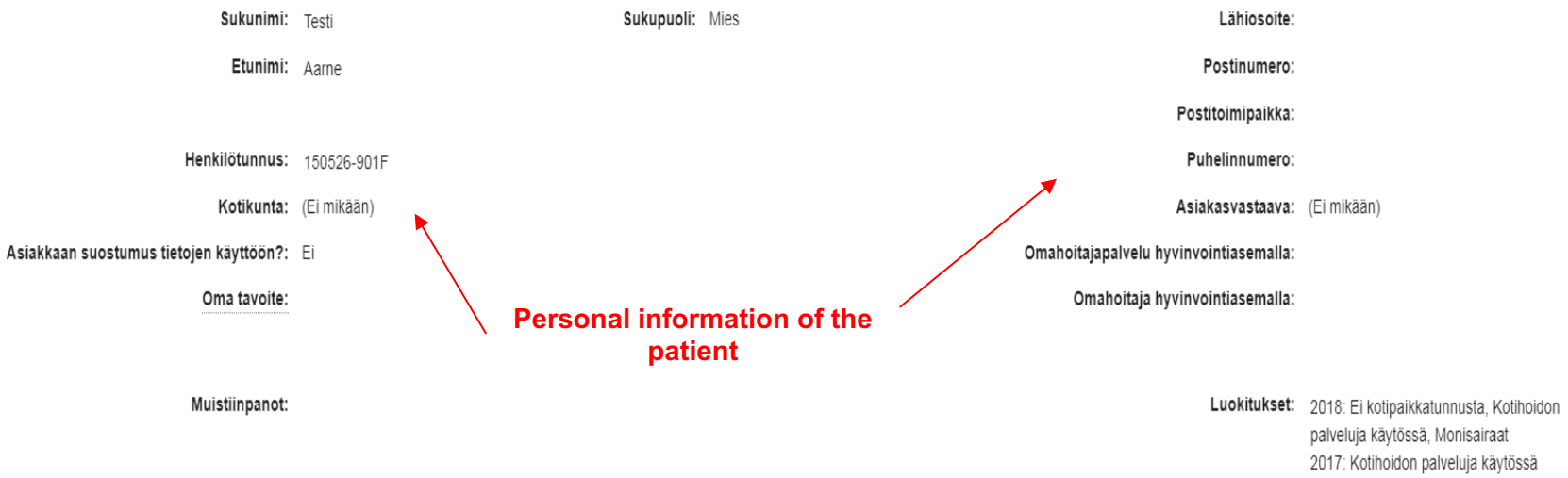
- 30 different Clinical Decision Support System (CDSS) solutions developed with agile business process management (BPM) approach covering areas like elderly care, mental health care etc.
- Technical platform used for the development work is Solutions Business Manager (SBM) offered by Micro Focus (https://www.microfocus.com/en-us/products/solutions-business-manager/overview)
- Main objectives for the development of CDSS are effective workflow management and standardisation of tools
- Currently the focus is on developing overall customer management in order to maintain a holistic view of a patient's status in processes
- In a study by Korpela (2019) it was found that Eksote's customer management and operations management entity should be further improved with AI-based solutions to better support decision making

Holistic approach to managing customer information, processes and services



CUSTOMER MANAGEMENT **OPERATIONS MANAGEMENT**

Example view of the customer management system

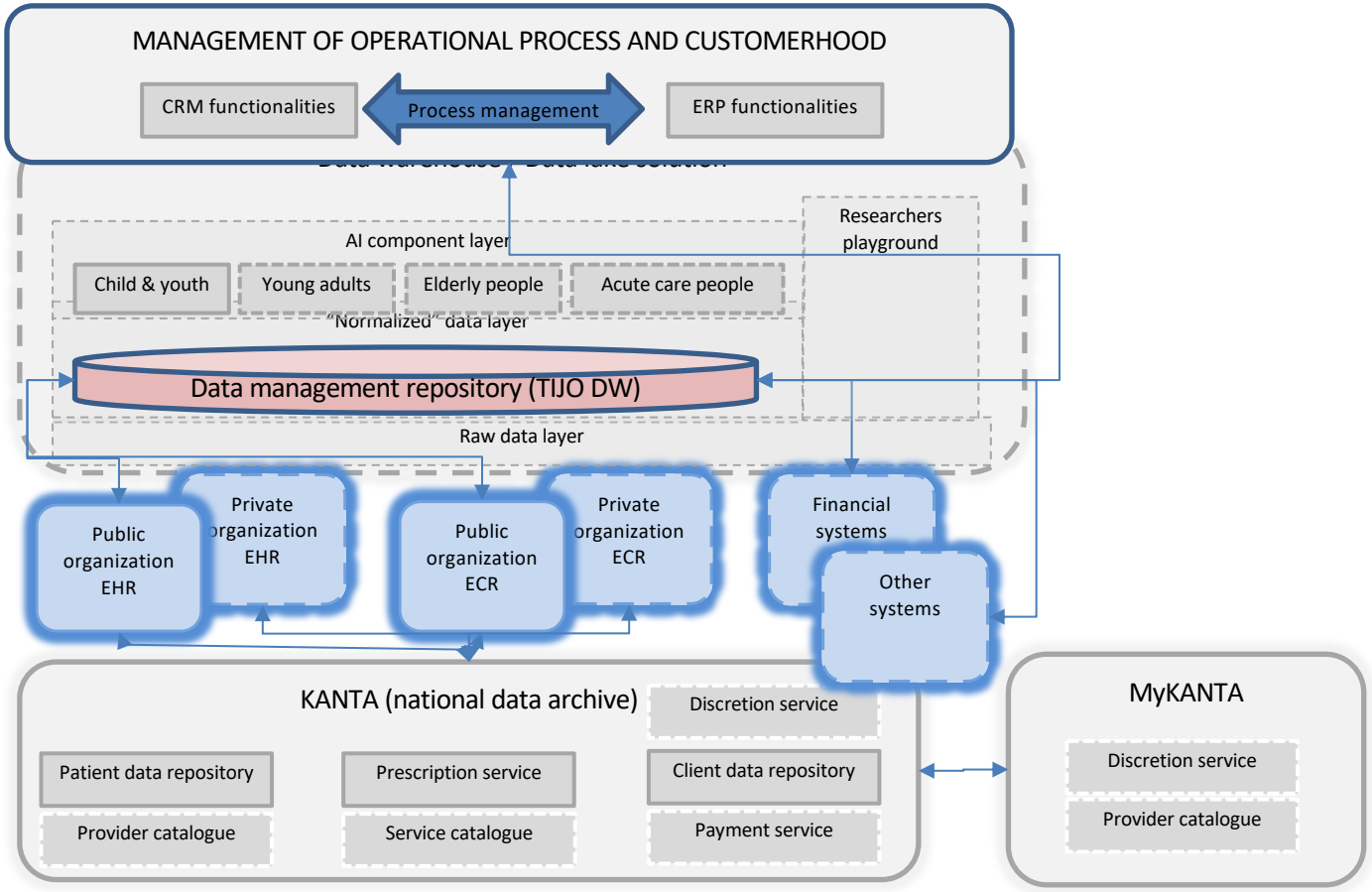


Personal information of the patient

Several tabs, that include information of the patient's:

- **Performance**
- **Services**
- **Plans**
- **Processes**
- **Metrics**
- **Diagnoses**
- **Medication**
- **Role specific information (acute care, welfare centres)**

IT Infrastructure – How everything is linked together?



Ideas, opportunities and challenges collected by interviewing professionals working currently in elderly care:

- IoT-devices to support the elderlies life at home, and to collect continuous data of how the customers are coping at home
- Predictions of deterioration of performance or effectivity of rehabilitation
- Improved proactivity
- Digital, AI-supported service needs assessment

COLLECTED IDEAS

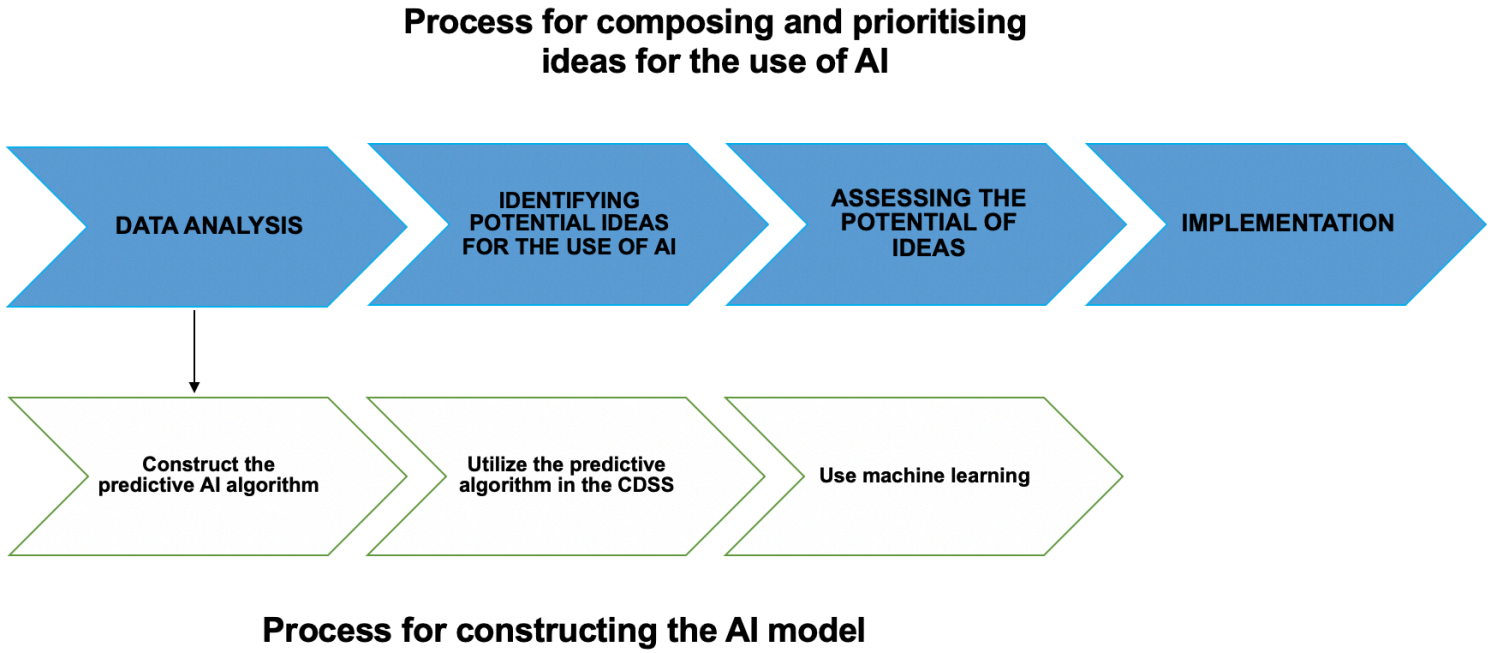
- Improved support for decision making
- More timely and more tailored service bundles for the elderly
- More proactive assessments of changing performance ability

OPPORTUNITIES

- Limited understanding of AI
- Poor quality and limited amount of available data
- Shared decision-making between AI and a professional
- Ethical issues
- Excessive customer segmentation
- New operating models must be modelled

CHALLENGES / RISKS

Framework for identifying, prioritising and implementing AI-based solutions



The planned AI-based solution for home care

- The initial plan was to try to predict the need for home care or other services due to a decrease in a patient's ability to function based on structured data and free-form text

  → There is not yet enough good quality data for predicting changes in performance, although the situation is improving because of a new mobile assessment tool

- A more holistic approach was followed by concentrating on "heavy" users of services, of which most are elderly customers:

  - Based on both social care and health care data, which are combined in a data lake
  - Trying to identify common factors for different endpoints in the data
  - Testing for statistical significance and bringing forward the outstanding factors (risk factors, prediction of ending up in a specific endpoint)
  - Development of an AI solution that predicts whether the customer is at risk of ending up in a specific risk group
  - The solution supports the professionals' decision making

Digital service needs assessment

AI-based tools

Mobile tools

What's next in customer management?

Decreasing duplicate work and breaking down silos

Centralised customer management unit

More holistic process management approach, multidisciplinary teams

- **Improved decision making**
- **Increased productivity and cost savings**
- **Increased value and performance for the customers**