CONNECTIONS SUMMIT

The World's largest RFID based hospital installation

Villads Thomsen

CEO, Lyngsoe Systems

Short introduction to Lyngsoe Systems

IoT system integrator of logistics solutions used in a number of industries

”Our mission is to help companies automate their processes, streamline and develop their businesses through the use of best in class data capture solutions”

LIBRARY

POSTAL & LOGISTICS

HEALTHCARE

MANUFACTURING & SUPPLY CHAIN

AIRLINES & AIRPORTS

Short introduction to Lyngsoe Systems

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International Post Corporation
TARGET
postnord
bpost
BH POŠTA
HAVI
1879
CANADA POST POSTES CANADA
EATA
DIAGEO
Singapore POST
FedEx
POŠTA SLOVENIJE
CSC HEALTH
Royal Mail
CORREOS
LA POSTE
SITA
IBM
JP POST 日本郵便
itella
POSTA KENYA
CHANGI airport singapore
中国邮政 CHINA POST
GAP
New Zealand Post
LIETUVOS PAŠTAS
NAM POST
SYSTEMATIC
DELTA
ctt
post
EESTI POST
Q-POST
Posteitaliane
JAMAICA POST
AEROPORTI DI MILANO LINATE E MALPENSA
Ptt
Deutsche Post
Hongkong Post 香港郵政
SAS
PÓSTURINN allur pakkinn
CORREOS DE MÉXICO
GETINGE GETINGE GROUP
postnl
香港機場管理局 AIRPORT AUTHORITY HONG KONG
Posten Norge
SWISS POST
ISRAEL POST
ANA Aeroportos Lisboa
AUSTRALIA POST
Reebok
ALGÉRIE POSTE
CORREO ARGENTINO
البريد السعودي Saudi Post
Post
CORREO URUGUAYO
UNITED STATES POSTAL SERVICE
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The next 19 minutes…

- Background
- The Situation
- The Solution
- The Benefits
- The Future

Trends within Danish Healthcare

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- Reduction in number of hospitals and beds
- Centralization and specialization
- Fewer hospitals with Emergency Department
- Focus on prehospital emergency care
- Focus on intermediate care
- Number of discharges over the last 8-10 years – slight increase
- Substantial increase in outpatient visits
- Average length of stay is now less than 4 days – huge decrease
- Hospitals to be renovated + new hospitals built (5 billion $ being spent)

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Vision of Hospital 4.0

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- Basic drivers for running the hospital and achieving efficiency
  - Turning (even more) into digitalization
  - Focusing on logistics
  - Automation (where possible)

- Strategy incepted in the period from 2005-2008

midt
Central Denmark Region

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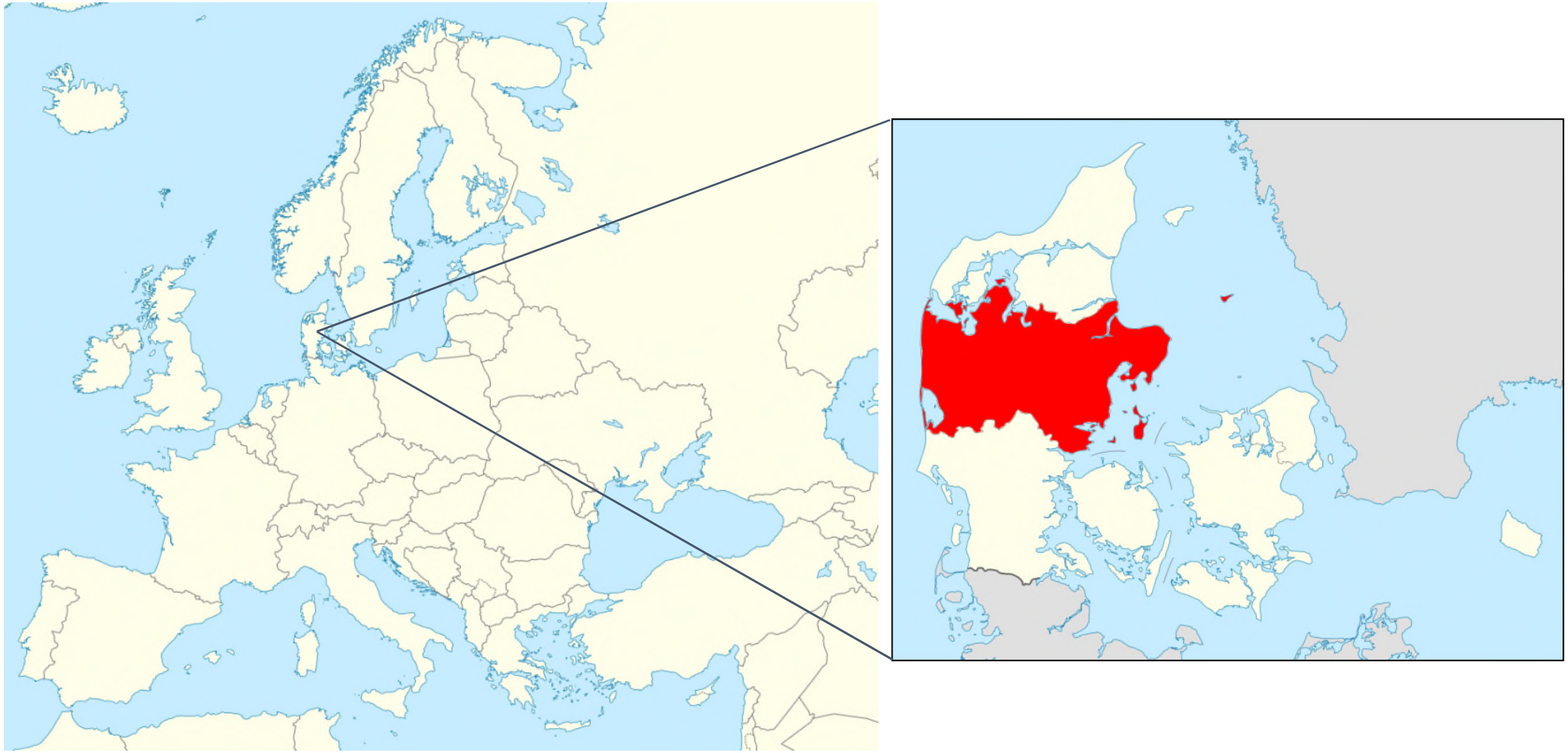
Merging for modern care



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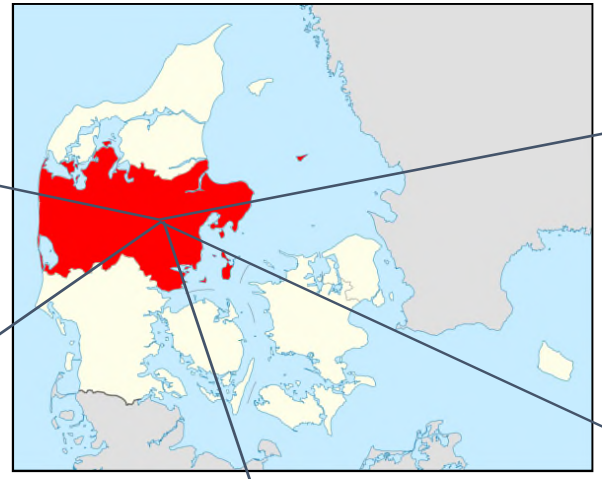
Merging for modern care



The Aarhus University Hospital

- New generation of super-hospitals
- Covering 500,000 m2/ 124 acres
- Buildings cover 1.25 million m2/ 309 acres
- 100,000 admitted patients and 900,000 outpatients a year at full capacity
- 35,000 daily transports
- 10,000 employees

The Situation

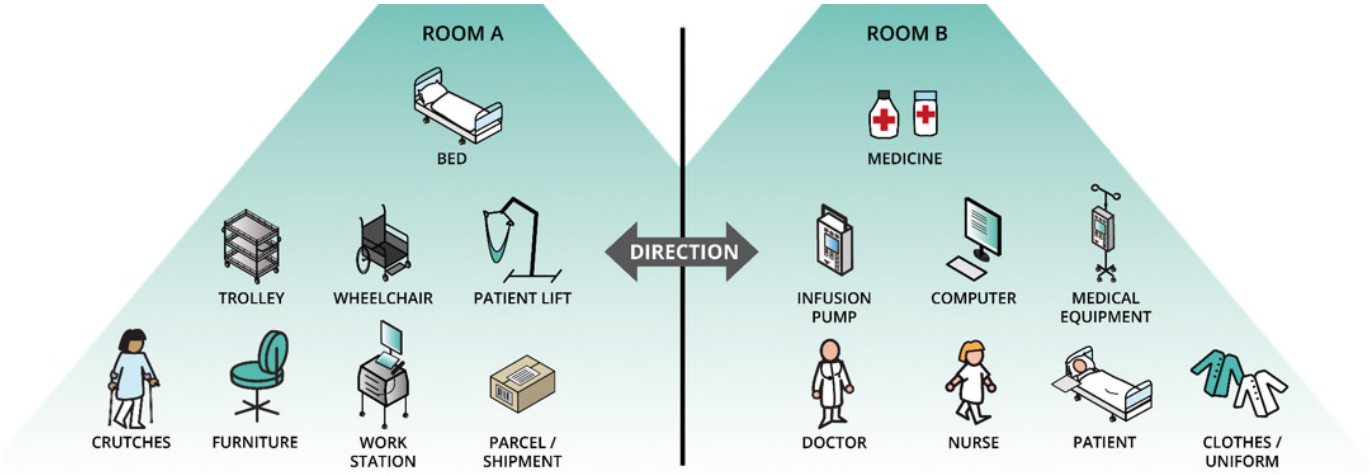
- Every employee wasted time every day to look after medical equipment and colleagues
- The process of ordering and collecting beds at wards was too time consuming and cumbersome
- Poor capacity management and transportation optimization – no overview of where resources were needed and when
- Low utilisation of medical equipment and excess purchase of same due to lack of location data
- Periodic maintenance of medical equipment and other moving objects not at acceptable standards as location was unknown

Scope

- Systems that **automatically** register **location** and **identity** of a **mobile** object at a known **time**

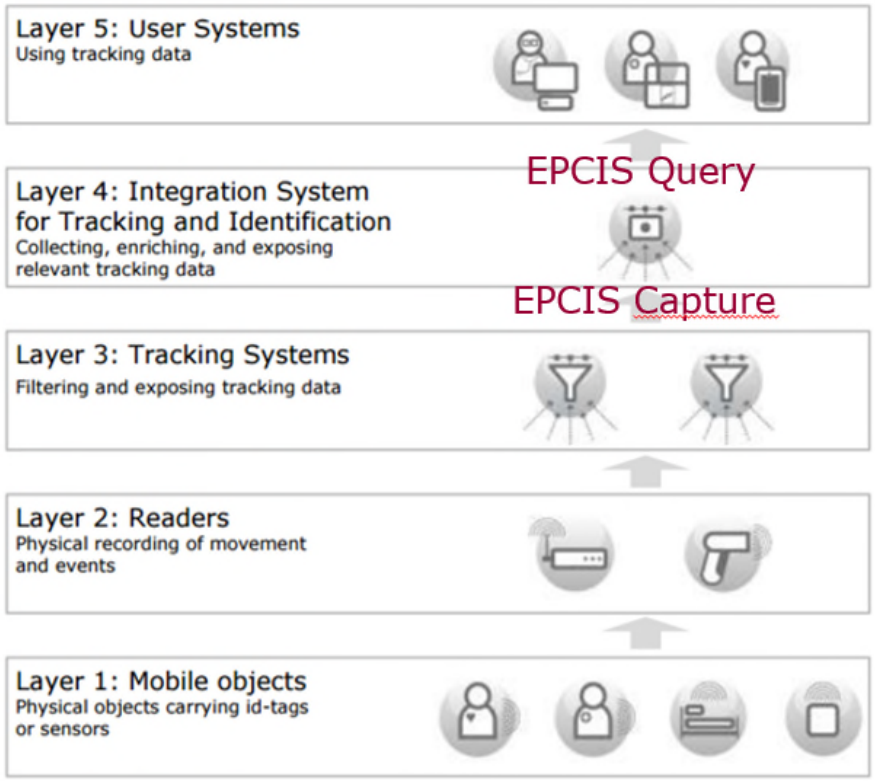
- Systems able to consume the above mentioned information

- What: eg medical equipment and people
- Where: eg room, warehouse
- When: eg arrival of bed at room



The Solution

- EPCIS system is technology agnostics and enables integration with multiple technologies….



Built on GS1 Standards

- GTIN - Global Trade Item Number – eg products
- GRAI - Global Returnable Asset Identifier - eg transport cages
- GIAI - Global Individual Asset Identifier – eg ultrasound equipment

Traceability (Location)

- GLN - Global Location Number - each room is given a GLN number, also enabling wayfinding for patients…

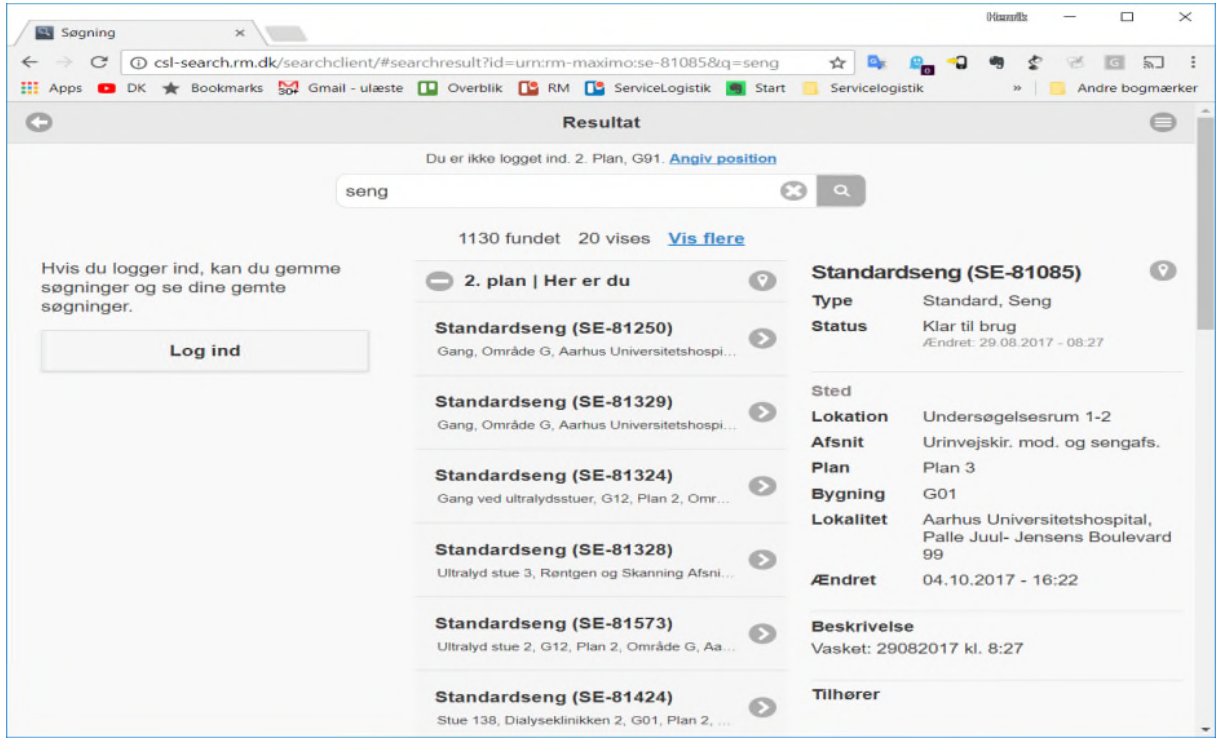
Time

- UTC

Examples of use cases

- Quality assurance - to use item identification and localization to support important hospital processes
- Search time reduction - reduction in time used in finding objects and colleagues
- Usage and Capacity Management - effective utilization of space, equipment, beds, consumables etc.
- Transit time reduction & nearest employee handles task - improved, real-time insight in the actual workflows and logistic processes

Quality Assurance



Use Case: Maintenance

By aggregating items with relevant data of applied maintenance and service, staff members can ensure equipment is “fit” for use and can easily manage maintenance schedules.

Search time reduction

Use Case: Finding co-workers

As much as 50 percent of the time used to search for personnel and items can be cut.

Usage and capacity management

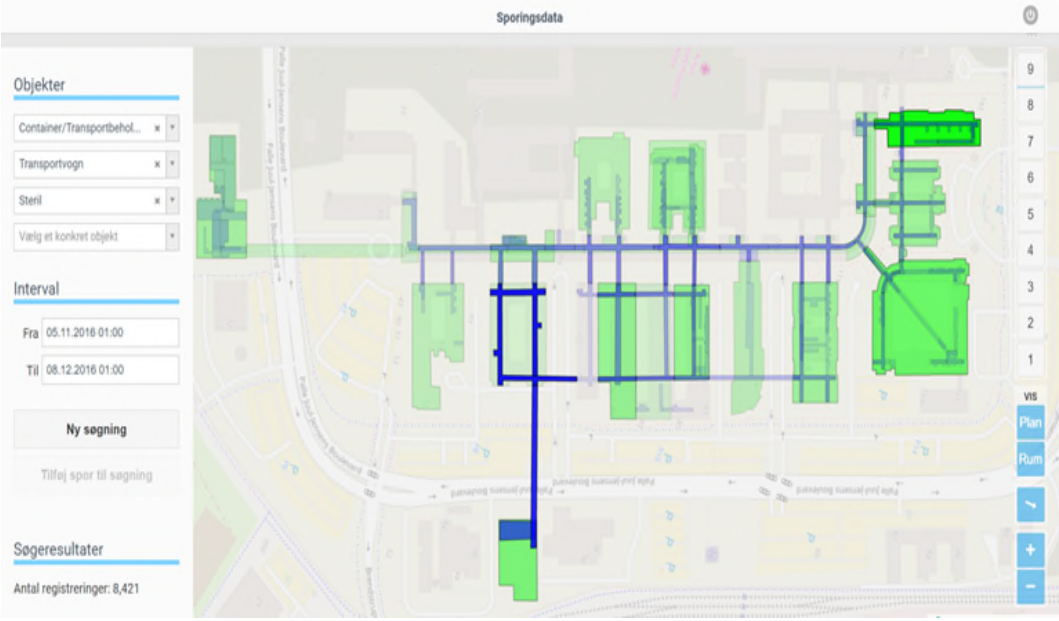
Rooms and areas in the hospital have different use. A bright color in a storage room or a hallway indicates that the item examined spends most of its time out of use.

Use Case: Utilization

The movement of devices in the hospital and identifying points of use gives an indication of potential use.

The hospital decides whether to decrease or increase the stock of a given device type or model

Transit time reduction

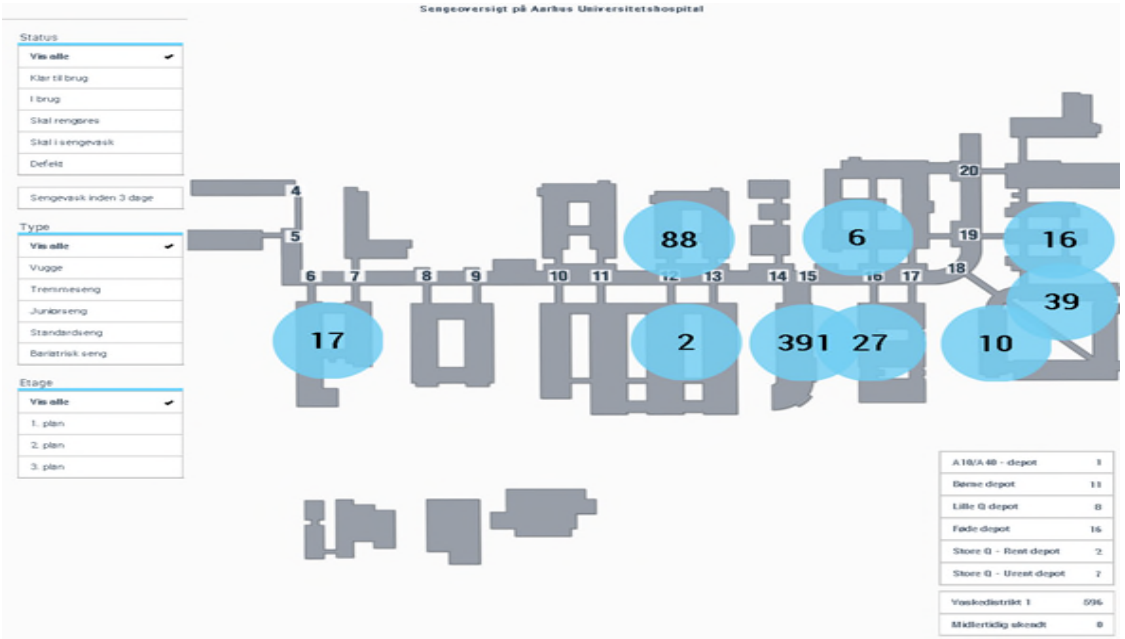


By examining heat maps of transit routes, hospital staff can change routes to avoid congested areas.

Use Case: Finding optimal routes through the hospital

The time used moving from point of origin to destination is automatically calculated with optimal transport routes and risk of congestion identified.

Nearest employee handles task

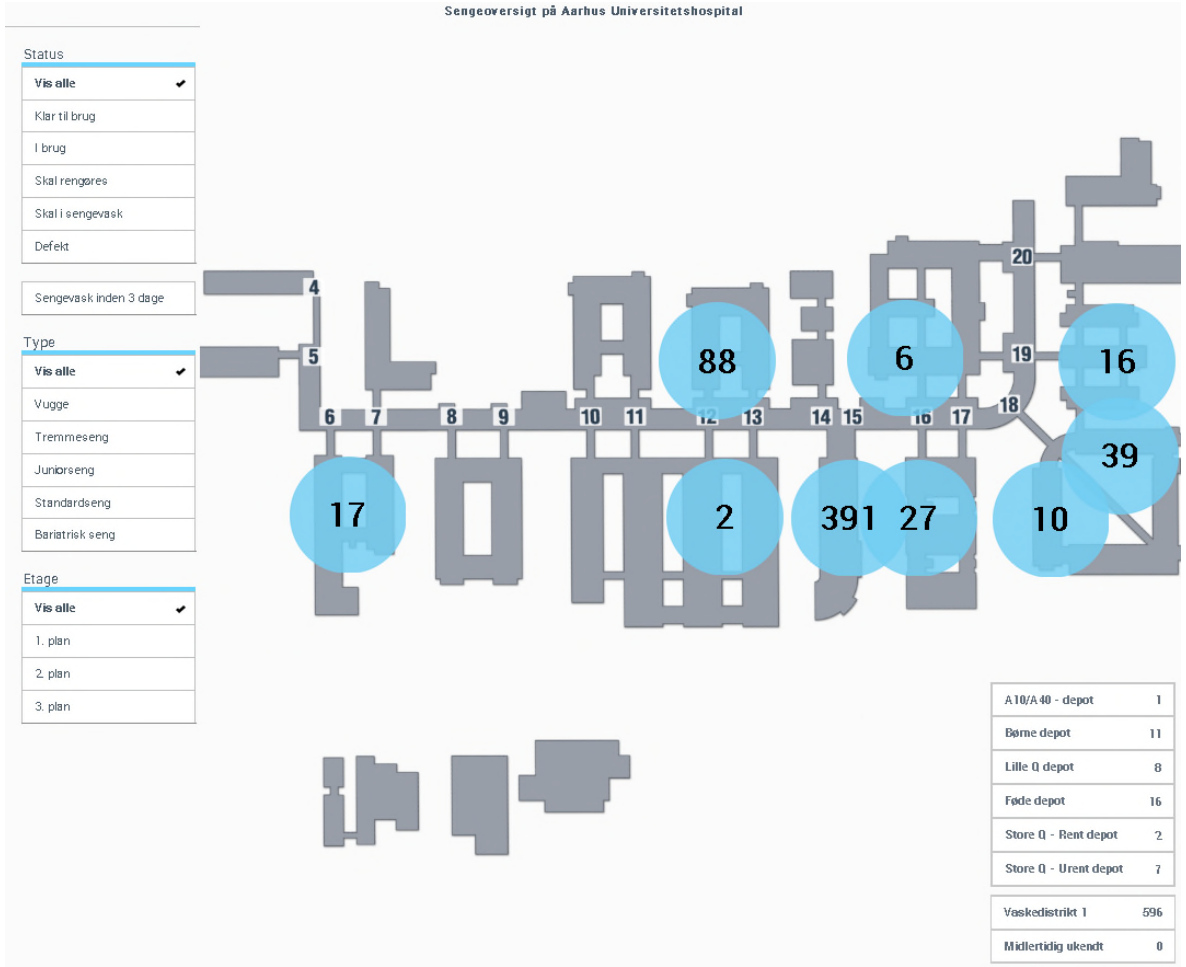


Overview of bed with a given status tells staff where to go and find the next task and plan their work with as little idle time for transit as possible

Use Case: Find beds that needs cleaning

Categorizing and sorting tasks based on location and type gives staff the possibility to autonomously decide where and when to solve the next task. Unproductive time is reduced when the nearest qualified employee handles a task.

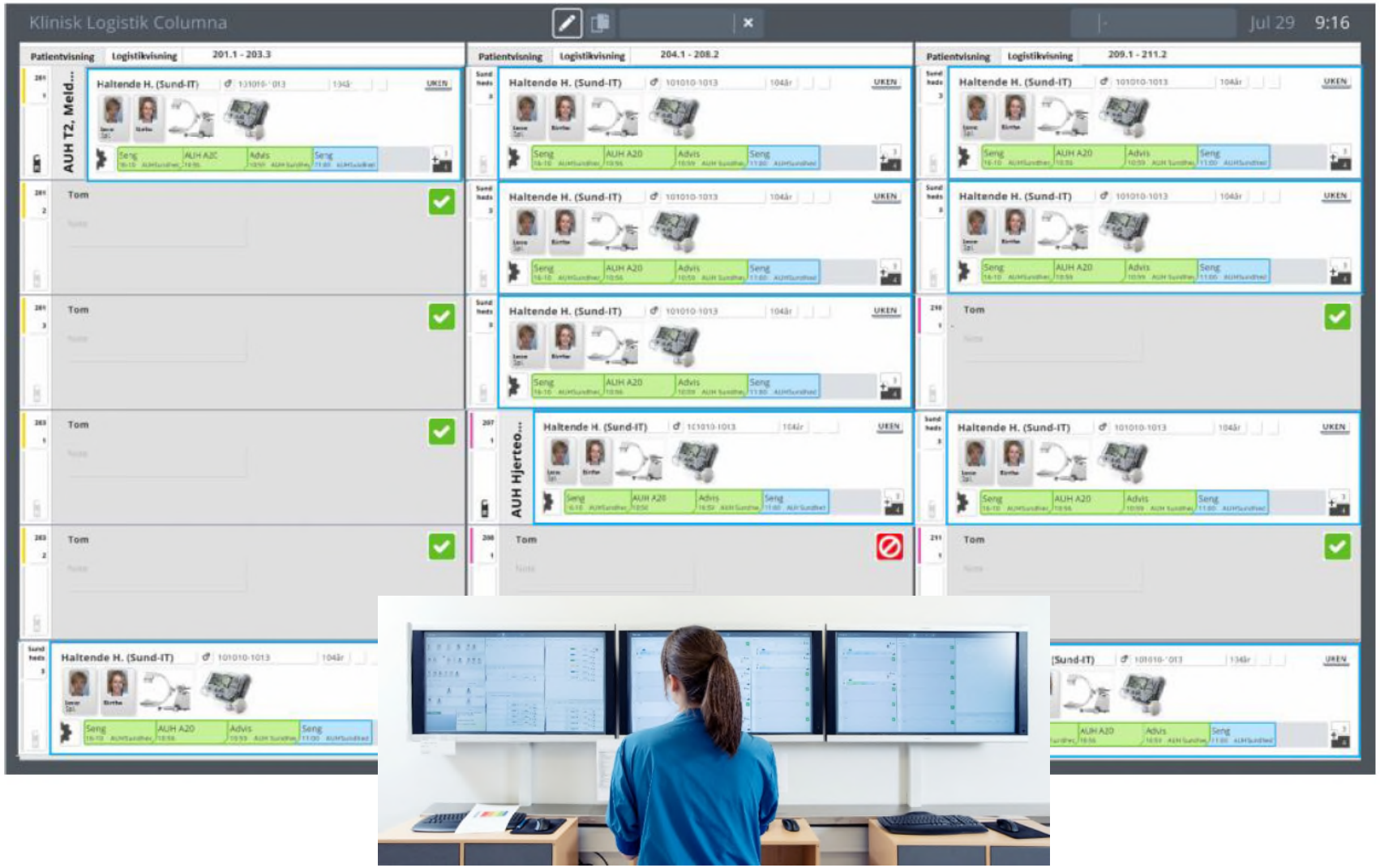
Bed Management



Use Case: Find beds that needs cleaning

- Bed touch pad at each bed
- Change status of bed immediately,
- 2 way communication

Clinical Overview



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The technical stuff

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Hardware

End 2017: 2,406 readers	- end of 2018: 3500	- 2019: 4000
End 2017: 5,449 antennas	- end of 2018: 7500	- 2019: 9000

Assets

- Expected # of assets tagged 250.000. Tagging proces is ramping up – right now around 20,000
- 2 “older” hospitals are moving into new buildings May 2018 at DNU and joins the existing hospital. Assets are identified and tracked in the process

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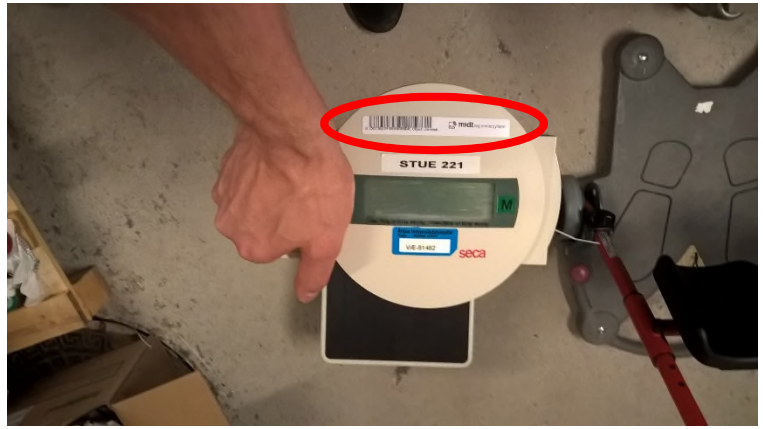
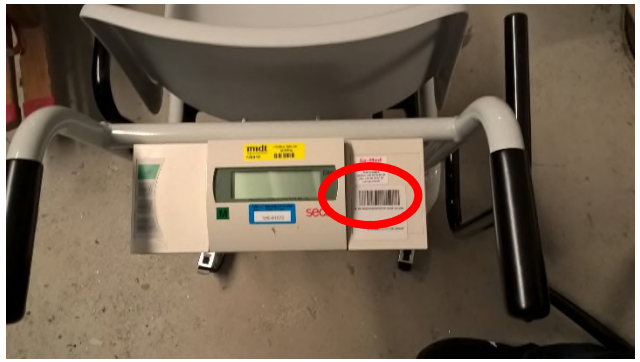
Example of tagged items… so far…

- Trollies, Staff, Phones, Clinical equipment, Beds, IT equipment, Medical devices, Containers, Vehicles, Bicycles, Art, Clothing, Food…





Infrastructure

The Benefits so far...

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- Search time reduction - **50% reduction in search time – 6 minutes per day per employee**
- Usage and Capacity Management – **reduction of beds – 200 pcs x USD 6t each = USD 1.200.000**
- Transit time reduction – **calculation of optimal transport route**
- Nearest employee handles task – **10 minutes saved on average per task**
- *These benefits all contribute to a more efficient hospital with increased patient safety*

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Well deserved awards…

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HPAC Award Winners

HPAC Provider Recognition Award - 17-19 October 2017

The Central region of Denmark was awarded one of the GS1 Provider best case study a[illegible]n fo[illegible]e new Aarhus University hospital

He[illegible]sed in five regions. The new Aarhus University h[illegible] region and is a merger of several hospitals. It [illegible] is to apply 'just in time delivery of goods' [illegible]tal' by the use of GS1 identifiers (among [illegible]nd patients, GLN's, EPCIS, GRAI, GIAI). Mr [illegible] original plan, the journey to [illegible]e already finished parts of the hospital and a[illegible]ty, logistics and the supply chain. Actually time is g[illegible]e since staff have to search less for supplies or assets [illegible]usion pumps, etc.) and can give direct support close to where they are. As a result of these implementations a reference IT-architecture is created for Denmark. The jury acknowledged this case to have a strong future vision and to be applicable also for other hospitals and countries.

"GS1 Healthcare Provider Advisory Council Award 2017"
Best GS1 hospital implementation in the world

RFID & wireless IoT tomorrow

Aarhus: wireless infrastructure in Europe's most innovative hospital!

2,000 RFID readers, an integrated task management system, automated processes, connected services, tracking of all assets, employee tracking: The new university hospital puts Hospital 4.0 into practise and thus becomes the European pioneer for smart hospitals. In Aarhus, the IoT infrastructure is as important as electricity and water. This innovative view of technology has now been honoured with the RFID & Wireless IoT Research and Solutions Award.

"RFID & Wireless IoT Research & Solutions Award 2017"
Europe's most innovative hospital!

"The Jury acknowledged this case to have a strong future vision and to be applicable also for other hospitals and countries"

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The Future

- Expanding with more use cases
- Ambition to share data with other hospitals, creating a standardized information flow
- Possibility to exchange masterdata with supliers through GS1 GDSN standard
- …and much much more

Questions?