WELCOME

Trouw

Uitgestelde zorg

Ziekenhuizen schalen zorg terug wegens toestroom coronapatiënten

Een saturatiemeter bij een coronapatient op de cohortafdeling van een ziekenhuis. Beeld ANP

Meerdere ziekenhuizen moeten door de instroom van coronapatiënten de operaties en behandelingen die eerder al verzet werden, opnieuw uitstellen.

———

Hannah van der Wurff 29 oktober 2021, 13:14

Trouw

Uitgestelde zorg

Ziekenhuizen schalen zorg terug wegens toestroom coronapatiënten

...onapatient op de cohortafdeling van een ziekenhuis. Beeld ANP

Meerdere ziekenhuizen moeten door de instroom van coronapatiënten de operaties en behandelingen die eerder al verzet werden, opnieuw uitstellen.

_____

Hannah van der Wurff 29 oktober 2021, 13:14

NOS

NOS NIEUWS • BINNENLAND (/NIEUWS/BINNENLAND) • WO 24 NOVEMBER 2021, 21:36

Planbare zorg verder afgeschaald, 'nieuwe fase ingegaan'

Uitgestelde zorg

Ziekenhuizen schalen zorg terug wegens toestroom coronapatiënten

2021, 21:36

DUIC

ALGEMEEN

DI 19/10/2021 - 10:14

UMC Utrecht hoeft reguliere zorg nog niet af te schalen, maar kijkt met oplettendheid

naar toekomst

Plan...
ingegaan

...onapatient op de cohortafdeling van ...

Meerdere ziekenhuizen moeten door de instroom van coronapatiënten de operaties en behandelingen die eerder al verzet werden, opnieuw uitstellen.

Hannah van der Wurff 29 oktober 2021, 13:14

VIRUSES

- Not resilient enough
- Flexibility desirable

INCREASE IN DEMAND

- Ageing population

- Medical-technical and ICT developments

Adapted Ministerie VWZ (2018)

DIGITALISATION

- Improvement in quality

- Decrease in cost

DIGITALISATION

Naar het ziekenhuis toe en de dokter een hand geven, dat is verleden tijd

▲ Longarts Yordi van Dooren van het Groene Hart Ziekenhuis in Gouda stond de afgelopen anderhalf jaar in het midden van de corona-orkaan. © sandra zeilstra

ZORG NA CORONA   Nu het aantal besmettingen daalt en er zo'n twintig miljoen vaccins zijn weggeprikt, kijken zorgmedewerkers vooruit. Wat hebben zij geleerd van de pandemie en hoe hebben ze deze periode beleefd? In deze laatste aflevering een gesprek met Yordi van Dooren en Jeannette von Lindern van het Groene Hart Ziekenhuis.

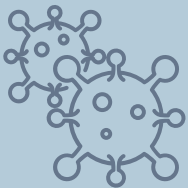**Maarten Molenaar** 05-10-21, 20:30 Laatste update: 06-10-21, 09:54

PROBLEM STATEMENT

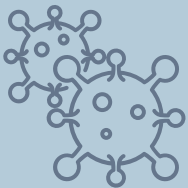Transformations

PROBLEM STATEMENT

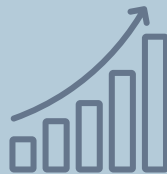**Transformations**

Covid19-
pandemic, other
viruses

PROBLEM STATEMENT

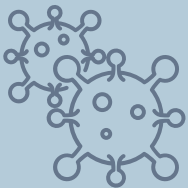**Transformations**

| Covid19-pandemic, other viruses | Increase in demand; aging population & medical-technical developments |

PROBLEM STATEMENT

Transformations

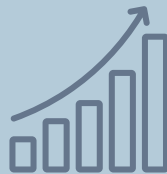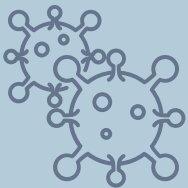| Covid19-pandemic, other viruses | Increase in demand; aging population & medical-technical developments | Digitalisation, innovation |

PROBLEM STATEMENT

Transformations

Covid19-pandemic, other viruses

Increase in demand; aging population & medical-technical developments
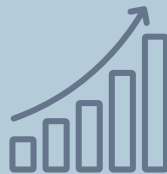
Digitalisation, innovation

The problem

Coalition Agreement Medical Specialists Care 2019-2022

Mismatch in Demand and supply
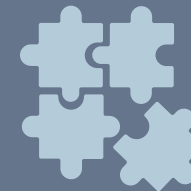
Smart Tools in the Outpatient Department

An exploration on to what extent smart tools and layout can contribute to an effective and efficient use of space in the outpatient department of a Dutch hospital

L.G. Cornelissen | P5 presentation | 14 January 2022

Delft University of Technology | Management in the Built Environment
Mentors: Prof. Dr. Ir. A.C. Den Heijer & Prof. Dr. P.W. Chan
AT Osborne b.v. | Robin Rudolphie

TUDelft   AT OSBORNE

Content

Context

Theories

Conclusion

Methodology

Practice

Recommendations
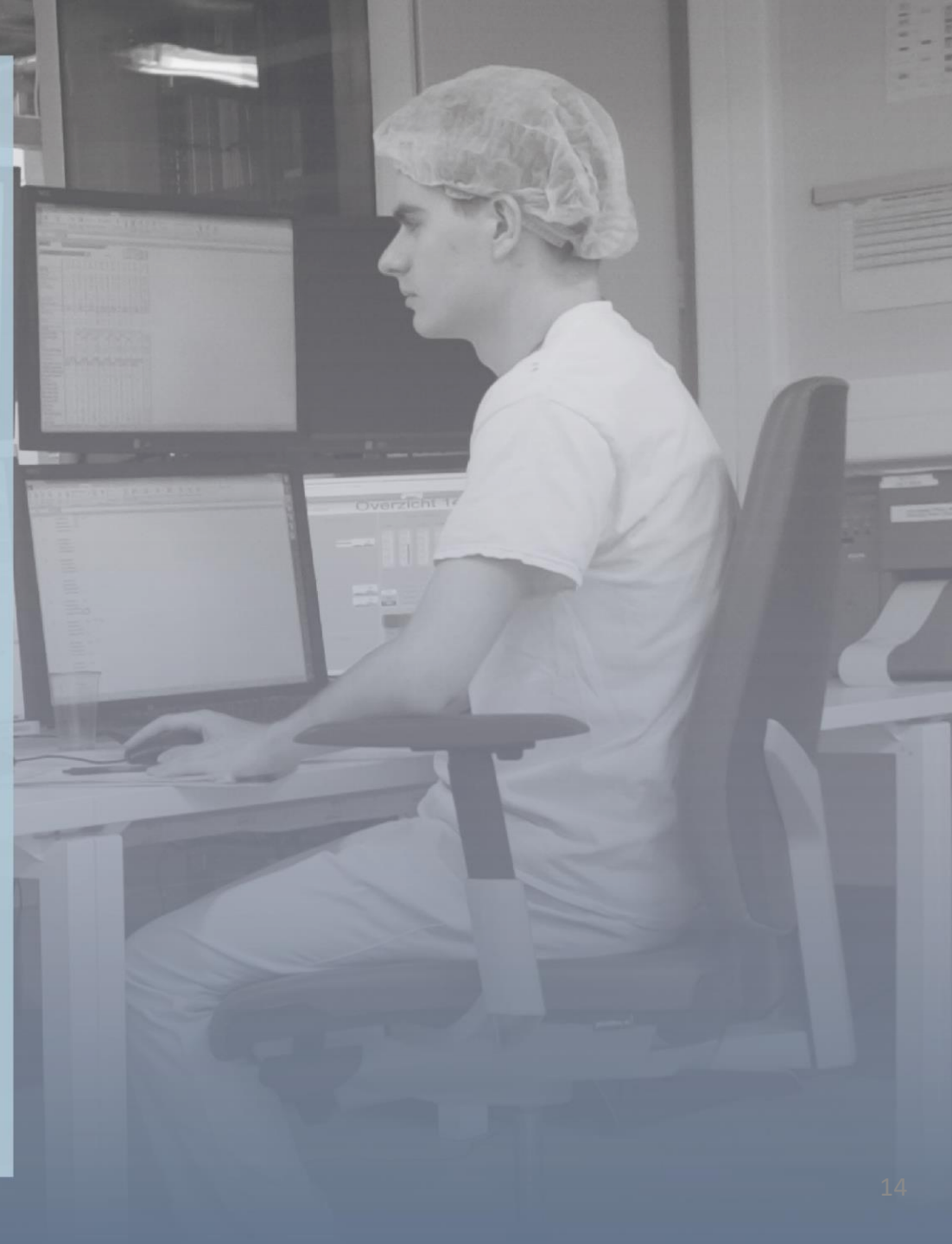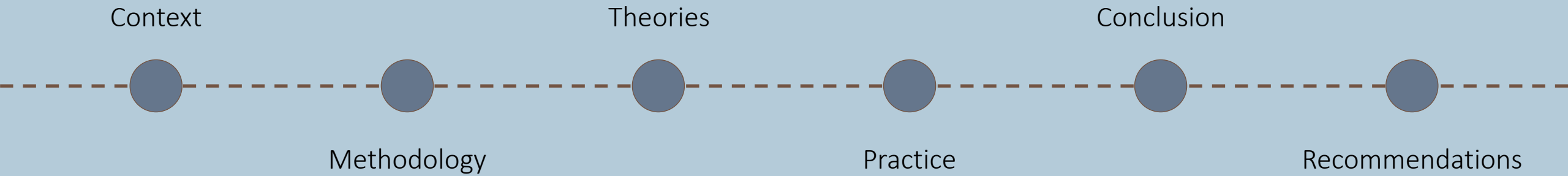
Context

Healthcare reform

1940 - 2006

Cutler's healthcare reform

Healthcare reform

1940 - 2006
Cutler's healthcare reform

2005

Diagnosis
Treatment
Combination
(DTC) system

Transparency: price-
setting, quality and
type of products

Healthcare reform

1940 - 2006

Cutler's healthcare reform

2005

Diagnosis Treatment Combination (DTC) system

Transparency: price-setting, quality and type of products

2006

All three waves of Cutler's healthcare reform implemented

Competition, reduce costs, market party

Healthcare reform

1940 - 2006

Cutler's healthcare reform

2005

Diagnosis Treatment Combination (DTC) system

Transparency: price-setting, quality and type of products

2006

All three waves of Cutler's healthcare reform implemented

Competition, reduce costs, market party

Patient

Healthcare delivery market

Healthcare insurance market

Governmental supervision

Healthcare supplier

Insurance company

Healthcare trade market

Healthcare reform

1940 - 2006
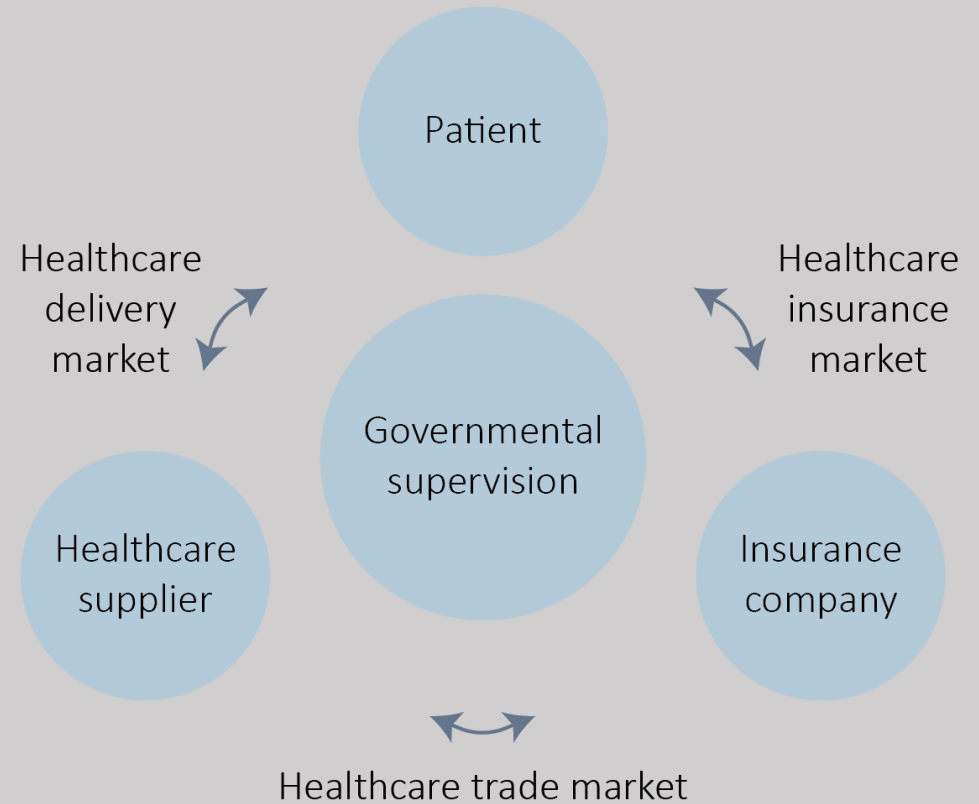
Cutler's healthcare reform

2005

Diagnosis Treatment Combination (DTC) system

Transparency: price-setting, quality and type of products

2006

All three waves of Cutler's healthcare reform implemented

Competition, reduce costs, market party

2008

Disbanding 'Bouwregime'

Dependable on production – real estate strategic tool

€ €

Methodology

Research question

To what extent can smart tools & layout
contribute to a more efficient and effective
use of scarce resources
in the outpatient department
of a Dutch hospital?

Sub-questions

Real Estate Management	The Outpatient Department	Smart Tools

Smart tools & layout → Efficient and effective use of scarce resources

To what extent can they contribute?

Hospital real estate-> the outpatient department (OD)

Sub-questions

Real Estate Management	The Outpatient Department	Smart Tools

Smart tools & layout → To what extent can they contribute? → Efficient and effective use of scarce resources

How can the current real estate portfolio be aligned to the organisational strategy?

Hospital real estate-> the outpatient department (OD)

Sub-questions

Real Estate Management

The Outpatient Department

Smart Tools

Smart tools & layout → Efficient and effective use of scarce resources

To what extent can they contribute?

How can the current real estate portfolio be aligned to the organisational strategy?

- What does the OD of a Dutch hospital entails?
  What activities take place
  What are the stakeholder's values

What is integral capacity management (ICM) and could this be an operating area where smart tools can be deployed?

Hospital real estate-> the outpatient department (OD)

Sub-questions

Real Estate Management	The Outpatient Department	Smart Tools

Smart tools & layout → Efficient and effective use of scarce resources

To what extent can they contribute?

How can the current real estate portfolio be aligned to the organisational strategy?

- What does the OD of a Dutch hospital entails?
  What activities take place
  What are the stakeholder's values

What is integral capacity management (ICM) and could this be an operating area where smart tools can be deployed?

- Which and how are smart tools used in public buildings?
- How can smart tools be implemented in the organisation?
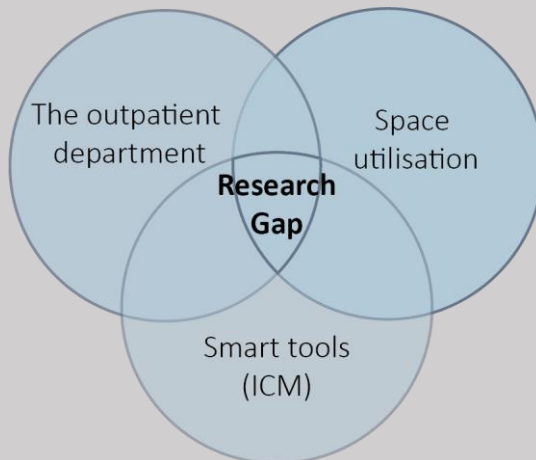- What is the influence of Big Data and IoT on the use of the OD?

Hospital real estate-> the outpatient department (OD)

Type of research

Methods

Qualitative approach
- Literature review
  - Real estate management
  - Outpatient department
  - Smart tools

The outpatient department

Space utilisation

Research Gap

Smart tools (ICM)

Define research subject

P1

Describe problem statement

Formulate research questions

Literature review,
Answer q1, q2, q2.1, q3, q4, q5 & q6

P2

Perform literature review

Theoretical study

Empirical study

Analyse cases & conduct interviews

Case studies & interviews
Answer q2.2

P3

Expert panel and project visit to validate findings

Expert panel & project visit
Answer main research question

P4

Answer research question

P5

Type of research

Methods

Qualitative approach
- Literature review
  - Real estate management
  - Outpatient department
  - Smart tools
- Case study
  - Interviews
  - Project visit

Define research subject

↓

Describe problem statement

↓

Formulate research questions

↓

Theoretical study

Perform literature review

Empirical study

Analyse cases & conduct interviews

↓

Expert panel and project visit to validate findings

↓

Answer research question

Literature review,
Answer q1, q2, q2.1, q3, q4, q5 & q6

Case studies & interviews
Answer q2.2

Expert panel & project visit
Answer main research question

P1

P2

P3

P4

P5

Type of research

Methods

Qualitative approach
- Literature review
  - Real estate management
  - Outpatient department
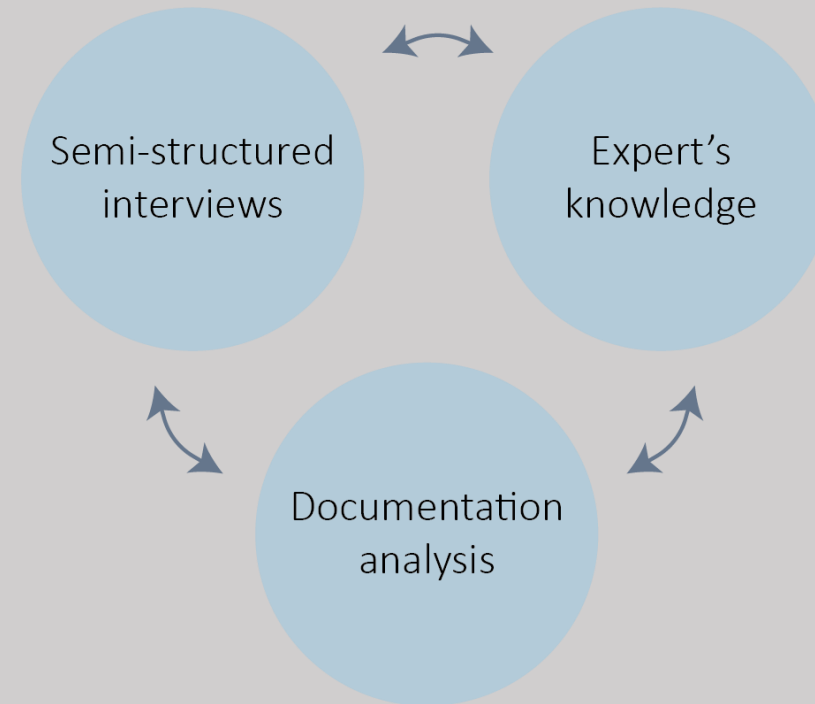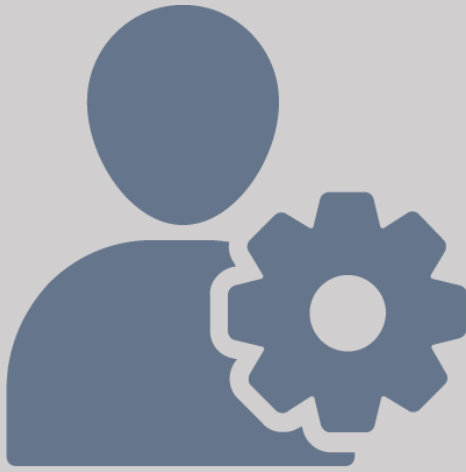 - Smart tools
- Case study
  - Interviews
  - Project visit
- Validation
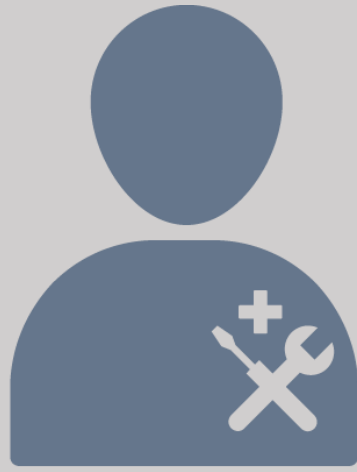 - Project visit
  - Expert panel meeting

Triangulation

Semi-structured interviews

Expert's knowledge

Documentation analysis

Interviews

Facility manager   Department manager   Doctor   Capacity manager

Case study

1 ![UMC Utrecht Wilhelmina Kinderziekenhuis logo]
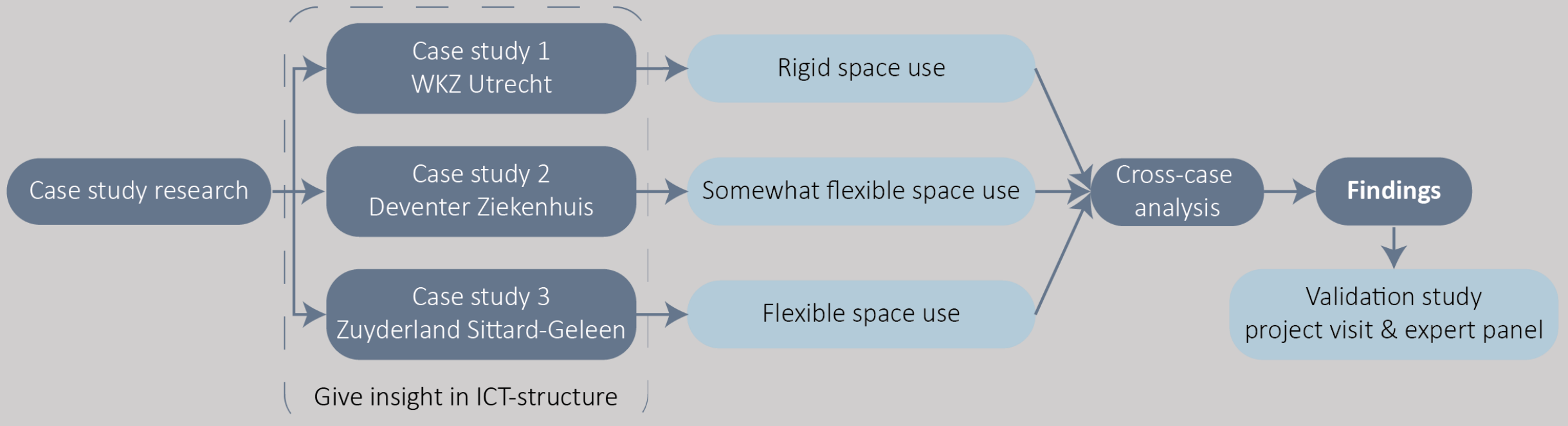
2 ![Deventer ziekenhuis logo]

3 ![zuyderland logo]
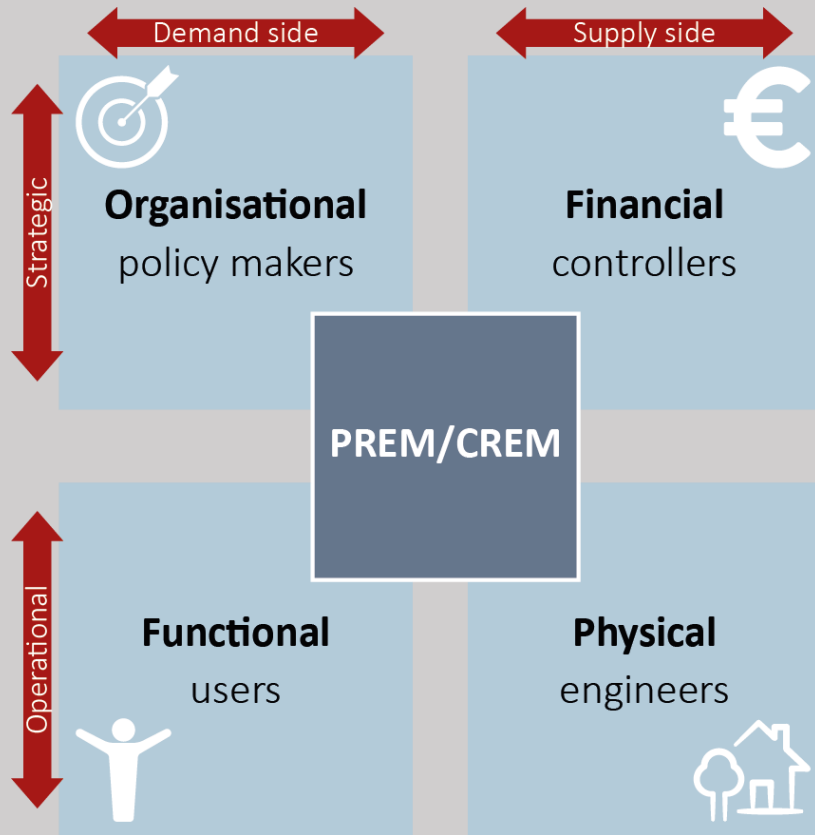
Case study

Theories

Real estate management

Public real estate management aims at adding value to performance by
- **Balancing** organisational, financial, functional and physical perspectives, variables and performance criteria in every decision about PRE portfolios
- **Matching** supply and demand in time, connecting operational and strategic processes.

(Den Heijer, 2021)

Real estate management
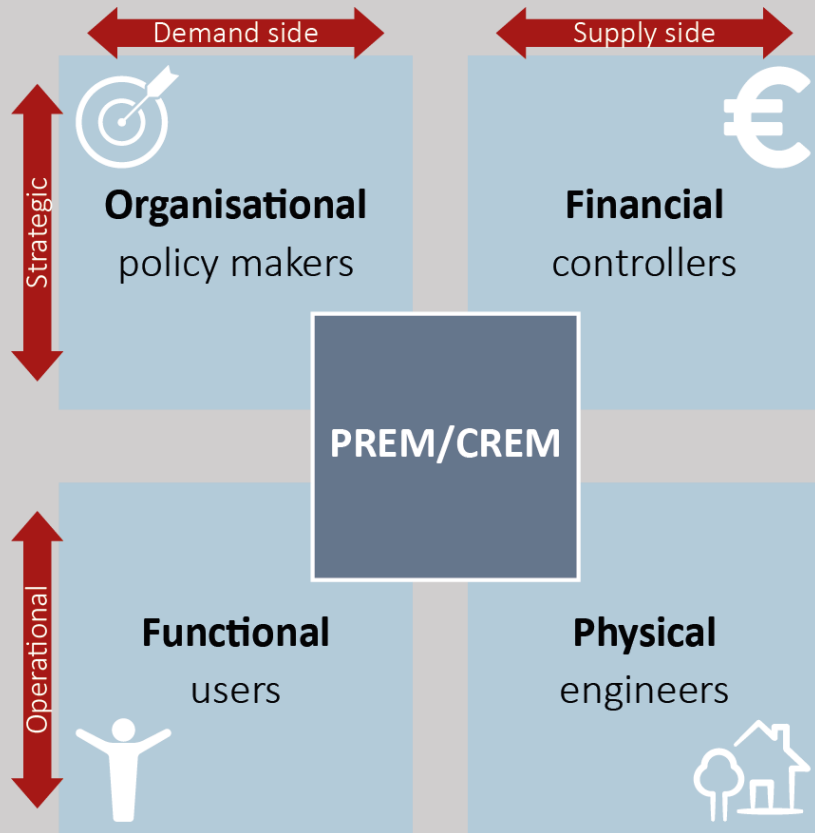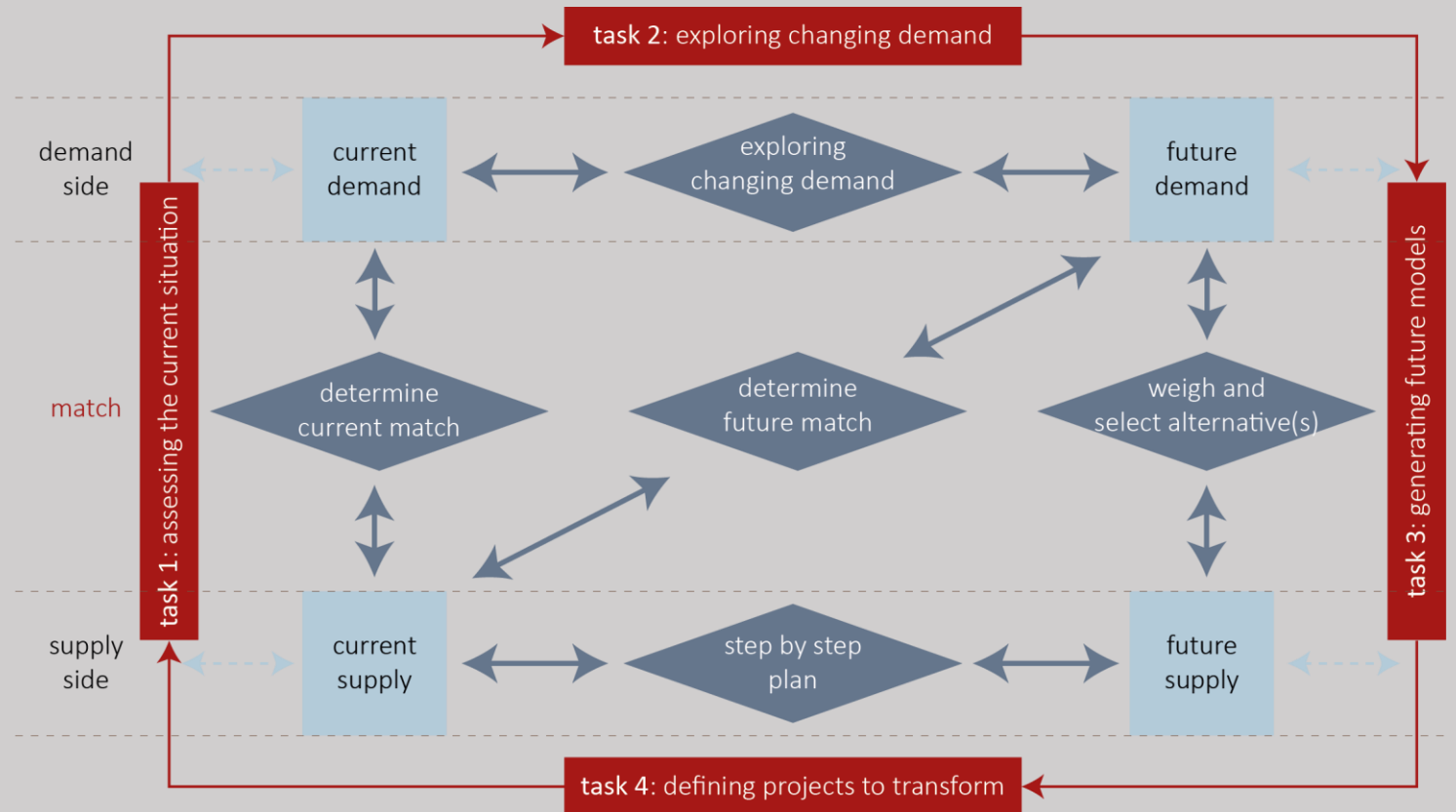
Four perspectives model

	Demand side	Supply side
Strategic	**Organisational** policy makers	**Financial** controllers
Operational	**Functional** users	**Physical** engineers

PREM/CREM

(Den Heijer, 2021)

Real estate management

Four perspectives model

Demand side | Supply side

Strategic | Operational

Organisational policy makers
Financial controllers

PREM/CREM

Functional users
Physical engineers

(Den Heijer, 2021)

Four perspectives model

task 2: exploring changing demand

demand side — current demand — exploring changing demand — future demand

task 1: assessing the current situation

match — determine current match — determine future match — weigh and select alternative(s)

task 3: generating future models

supply side — current supply — step by step plan — future supply

task 4: defining projects to transform

(Den Heijer, 2021)

Real estate management

States of matter model

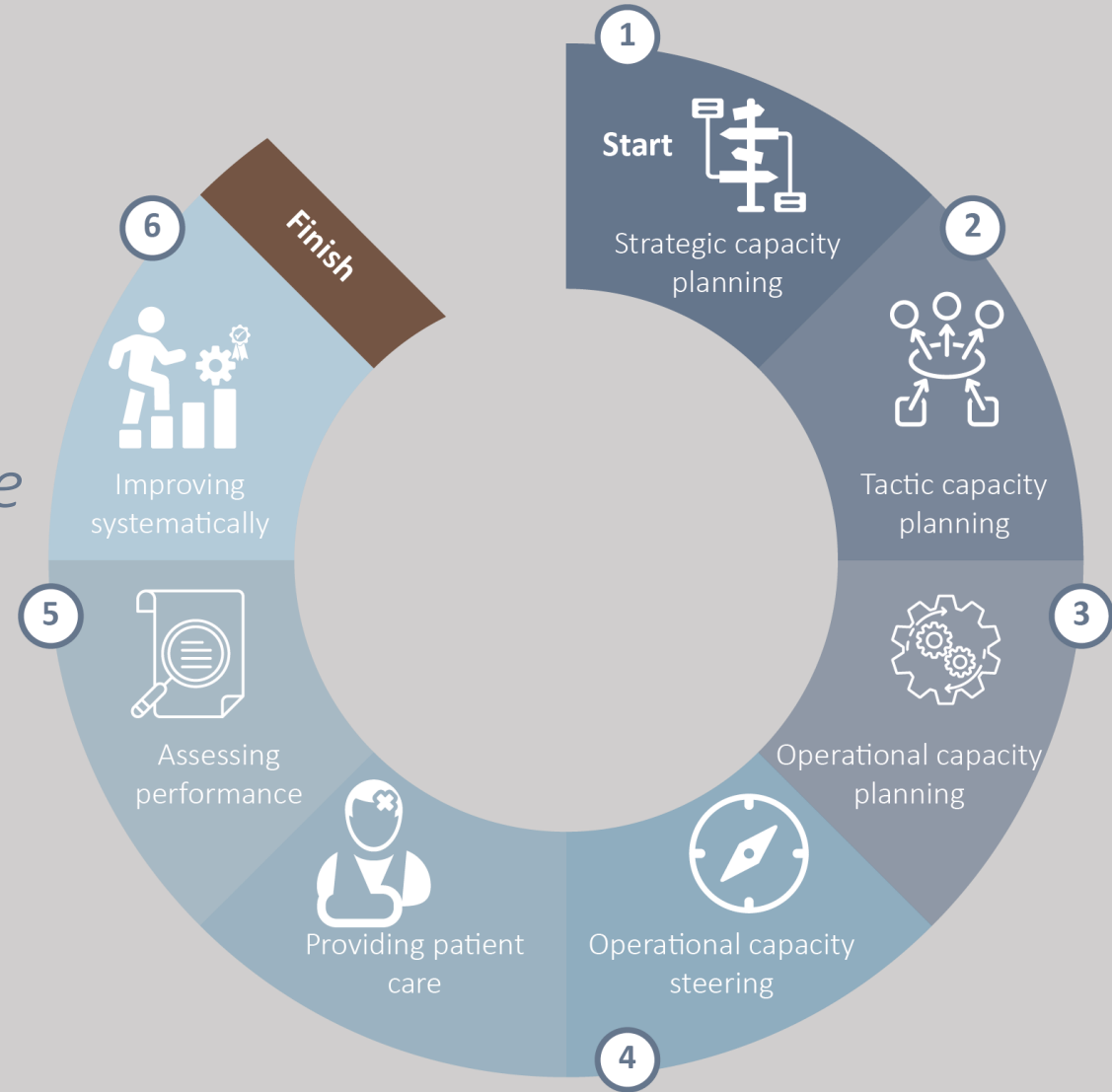|	**Model A - solid** traditional	**Model B - liquid** network	**Model C - gas** virtual
	top-down organisation	horizontal organisation	bottom-up organisation
	one place for healthcare	multiple places for healthcare	healthcare accessible anywhere
	hospital building	shared rooms/facilities	anywhere outside the hospital
	financing of the hospital in the Netherlands is based on the negotiations with the healthcare insurer		
	9-to-5 non-urgent 24/7 urgent	9-to-5 evenly over the week non-urgent 24/7 urgent	24/7

(Den Heijer, 2021)

Outpatient department

"Integral capacity management is matching supply and demand of care at all levels in the organisation."

(Interviewee F1, 2021)

Capacity manager

1 Start — Strategic capacity planning

2 — Tactic capacity planning

3 — Operational capacity planning

4 — Operational capacity steering

Providing patient care

5 — Assessing performance

6 — Improving systematically

Finish

(Speet, 2021)

Outpatient department - layout

Spatial separation of front office and back office

waiting area/ reception

consult/examination rooms

office workplace

Front office

Back office
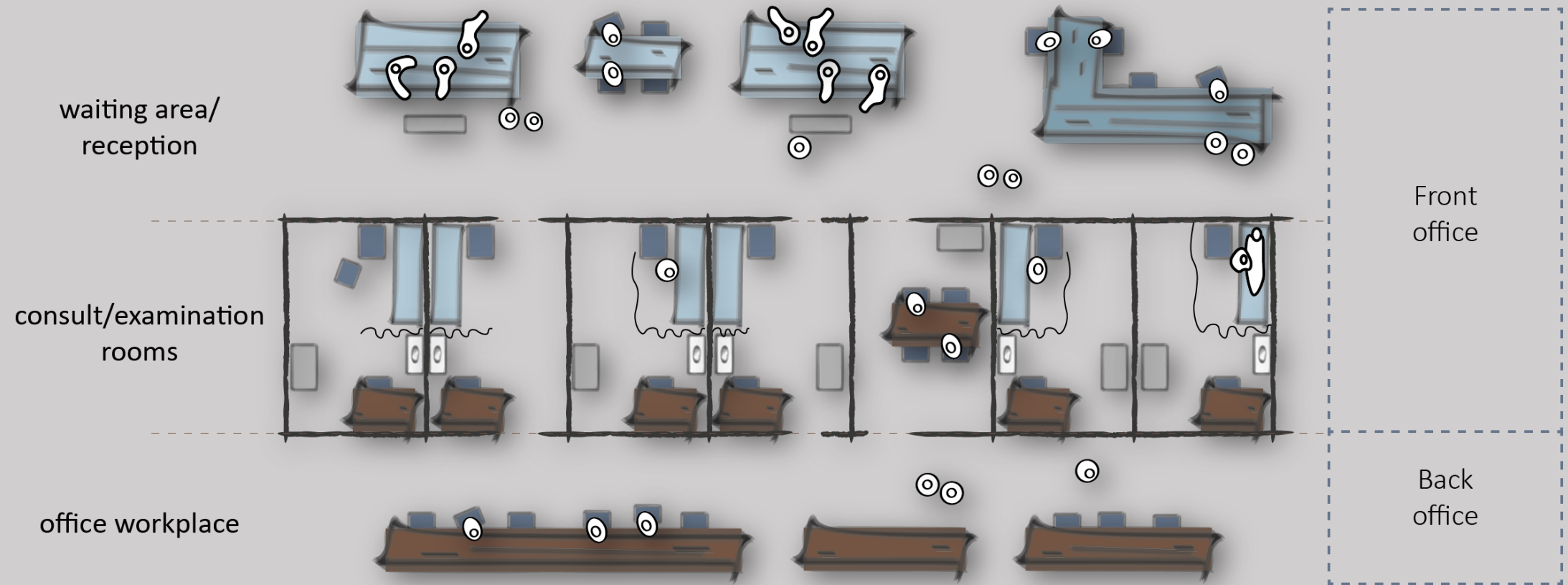
Smart tools

"A smart tool is a service or product which collects (real-time) information on space use to improve the space use on the current campus on the one hand, whilst supporting decision making on the future space use on the other hand."
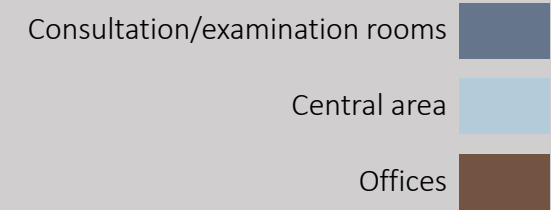
(Valks, Arkesteijn, and Den Heijer , 2018)
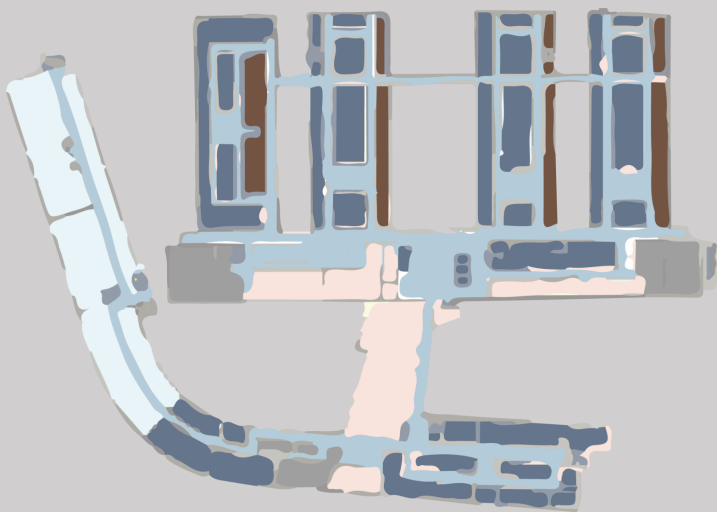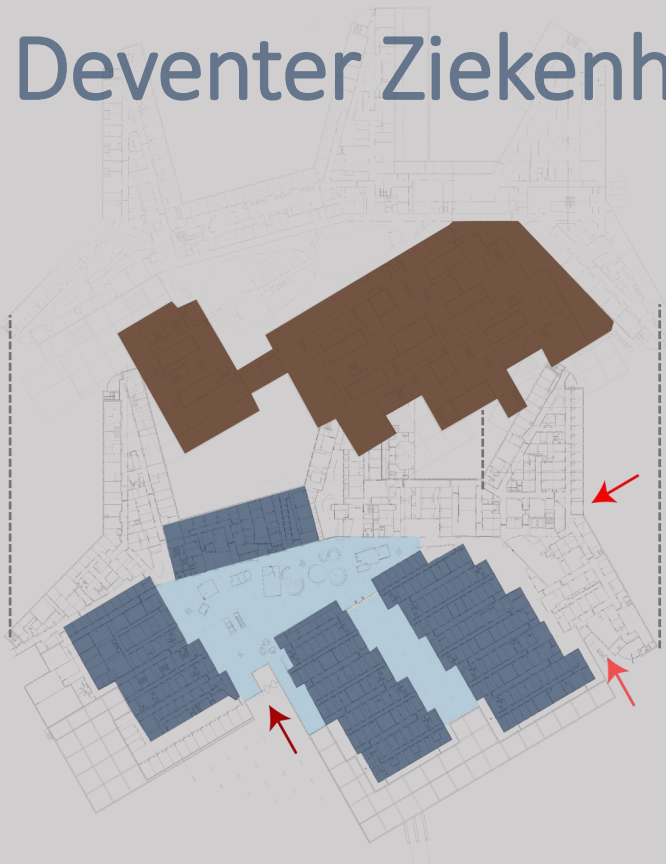
Smart tools

Architecture IoT

Sensing

(data collection)

Network

(data processing)

Application

(data provision)

Smart tools

Frequency, occupancy, identity, activity

Big Data

Hospital Control Centre (HCC)
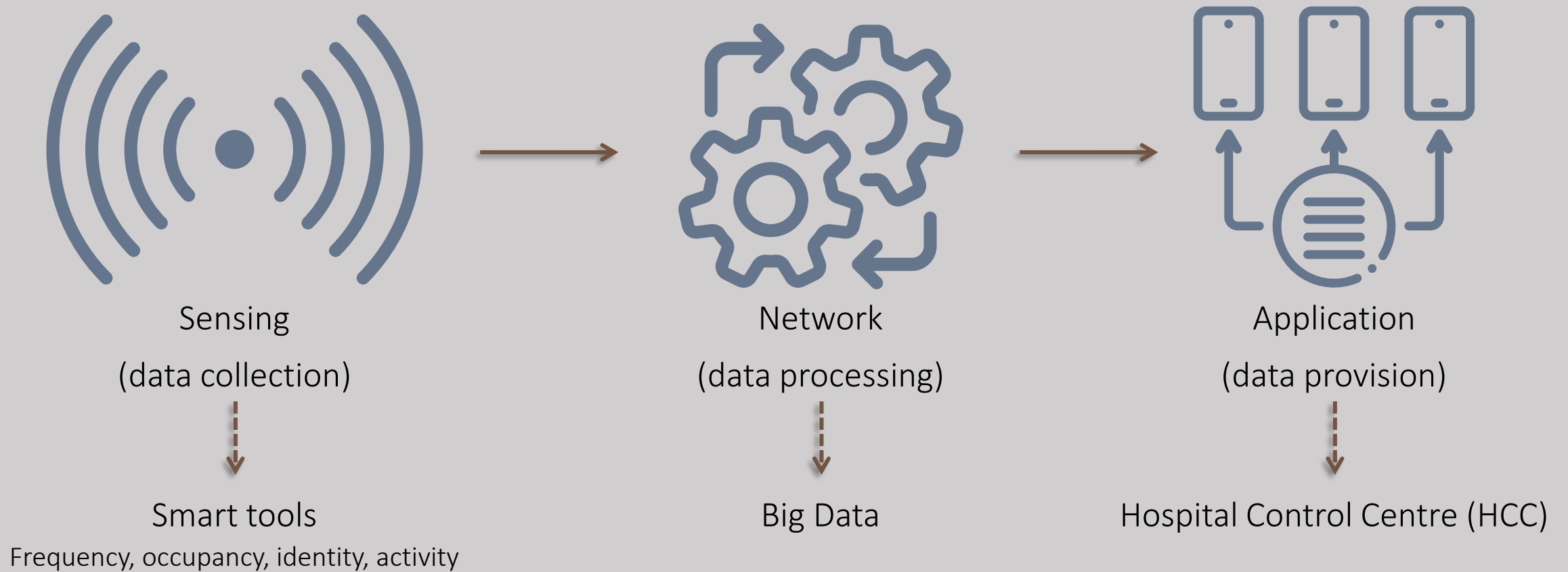
Practice

Cases

WKZ Utrecht

Deventer Ziekenhuis

Zuyderland Sittard

Layout space use rigid

Layout space use somewhat flexible
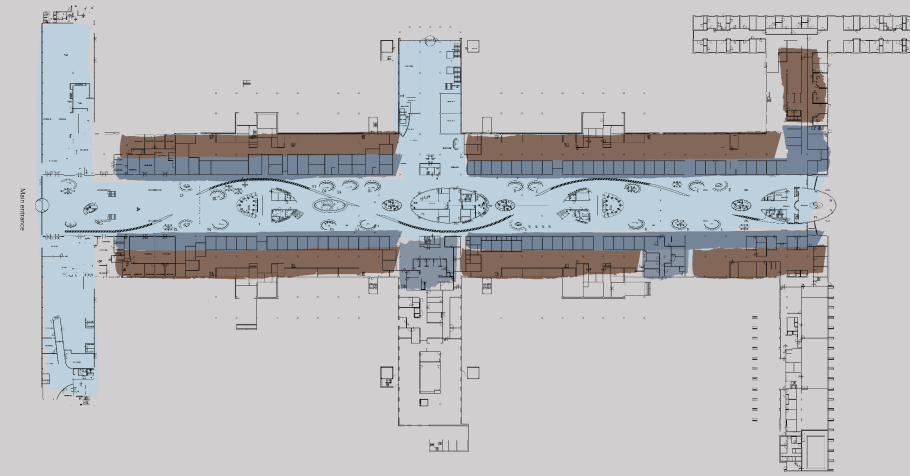
Layout space use flexible

Whilhelmina Kinder Ziekenhuis (WKZ)

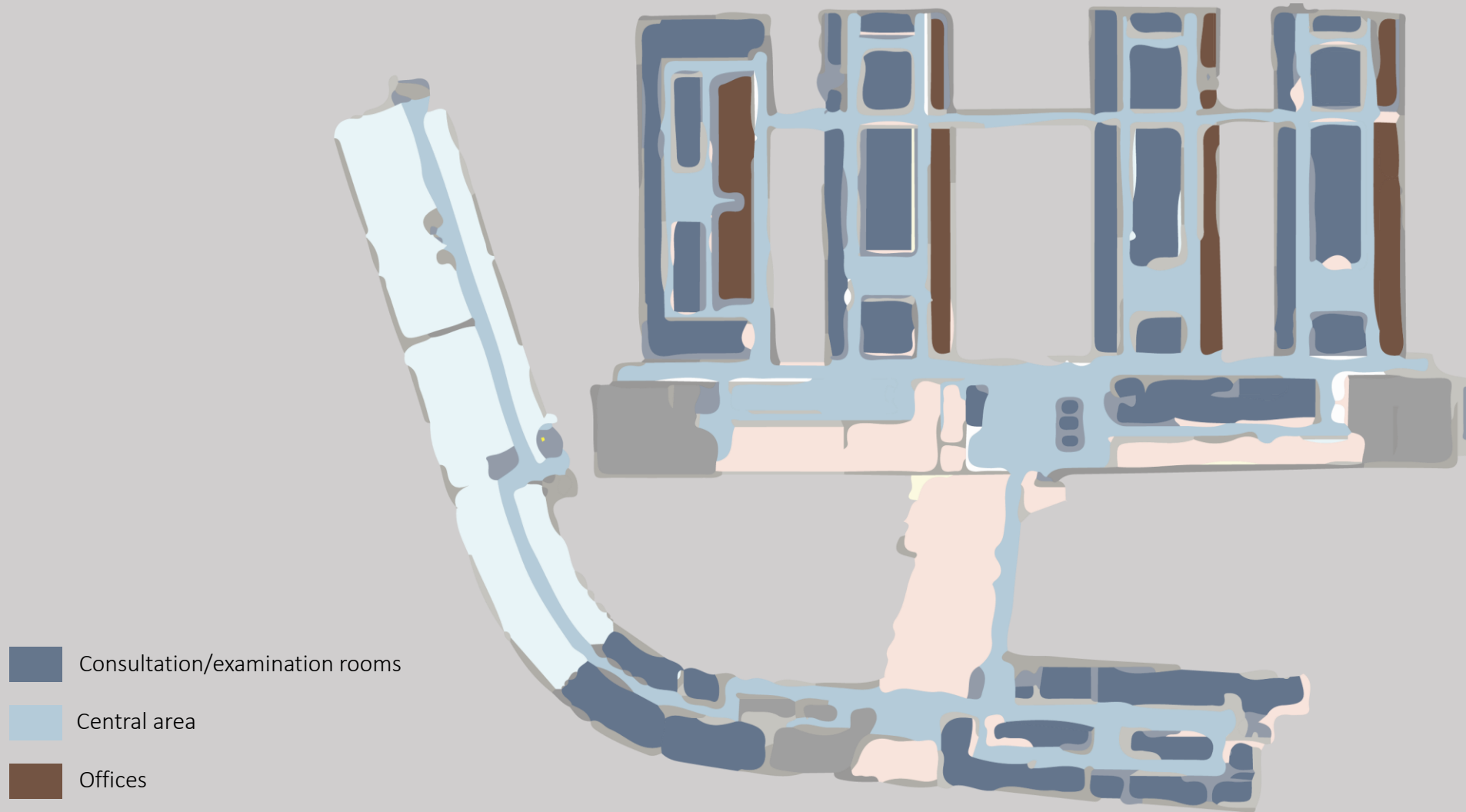*"We also have a general outpatient square, but this is not used."*

(Interviewee A1, 2021)

"Some people don't want to have to reserve a workplace in advance."

(Interviewee A4, 2021)

- Consultation/examination rooms
- Central area
- Offices

Deventer Ziekenhuis

First floor

Ground floor

Consultation/examination rooms

Central area

Offices

"I guess that 70% of the rooms are generic and thus interchangeable."

(Interviewee B3, 2021)

"The advantages are theoretical, but we make limited use of them in practice."

(Interviewee B1, 2021)

Zuyderland Sittard-Geleen

"Roughly speaking, 60% of the consultation rooms are designed to be generic."

(Interviewee C4, 2021)

"We have an apparent separation of patients, visitors and healthcare professionals. I think this contributes positively to the perception of the hospital. However, the flexible concept was abandoned fairly quickly in order to divide the spaces per specialism."

(Interviewee C1, 2021)

Main entrance

■ Consultation/examination rooms

■ Central area

■ Offices
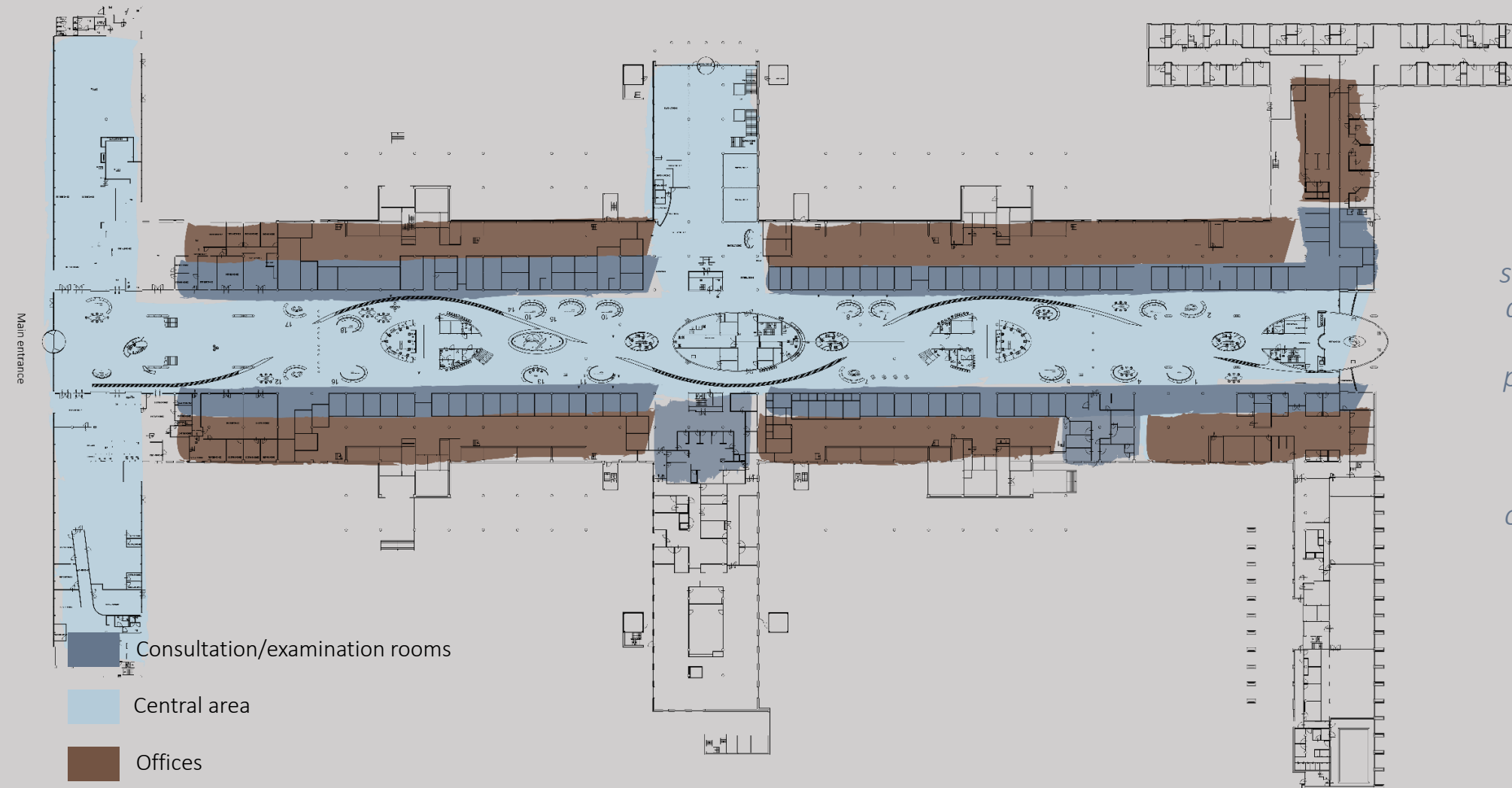
Cross-case analysis

The Outpatient Department	The organisation	Smart Tools

Cross-case analysis

The Outpatient Department | The Organisation | Smart Tools

- Mostly generic consultation/examination rooms

- Specific specialisms: gynecology, ENT, oral surgery, etc

- **Flexible use** of rooms within the specialism, but **not between the specialisms**

- Spatial separation of front office and back office is pleasant (or desired in case 1)

- Follow-up appointment is made at the front desk → online is preferred.

- Registration upon arrival by using a registration kiosk or mobile app is preferred → hospitality

"Once we had made the occupancy transparent and understandable, it turned out that 20% of the rooms were always available."

(Interviewee A2, 2021)

Cross-case analysis

The Outpatient Department	The Organisation	Smart Tools

- Supporting business & medical discipline

- Dual management

- Specialists are divided into groups of specialisms (units) → 'independent islands'

- Multidisciplinary consultations → more cooperation between specialisms

"The medical specialists work very independently, which is logical, because they are specialised professionals."

(Interviewee B2, 2021)

Cross-case analysis

The Outpatient Department	The Organisation	Smart Tools

- EPD (electronic patient document) is the primary source

- All cases perform e-consultations or telephone consultation.
  - Case 1 goal; 50% remote working
  - Case 2 goal; -
  - Case 3 goal; 33% remote working

- No shortage of rooms after insight in occupancy
  - This is entered manually (Excel or MedSpace)
  - A link between space allocation program and EPD (and registration kiosk) is desirable

- Only Case 3 has an HCC

"The integral coherence between the patients, the staff and the rooms is completely missing in the outpatient department. We only have production information at our (ICM) disposal."

(Interviewee C2, 2021)

Patient journey

Complaint   **Appointment**

①

Ⓐ

Schedule appointment

Patient journey

Complaint — Appointment — Registering — Preliminary examination

① ②

Ⓐ
Schedule appointment

Patient journey

Complaint   Appointment   Registering   Preliminary examination   Waiting room

① ② ③

Ⓐ Schedule appointment   Ⓑ Get's sign

Patient journey

Prelimin

Complaint   Appointment   Registering   Preliminary examination   Waiting room   Anamnesis (consultation)

① ② ③ ④

Ⓐ Ⓑ Ⓒ

Schedule appointment   Get's sign   Anamnesis (consultation)

(Physical) examination

Patient journey

Preliminary conclusion

Complaint | Appointment | Registering | Preliminary examination | Waiting room | Anamnesis (consultation) | (Physical) examination

① ② ③ ④

Ⓐ Ⓑ Ⓒ Ⓓ

Schedule appointment | Get's sign | Anamnesis (consultation) | Multidisciplinary consultation

(Physical) examination
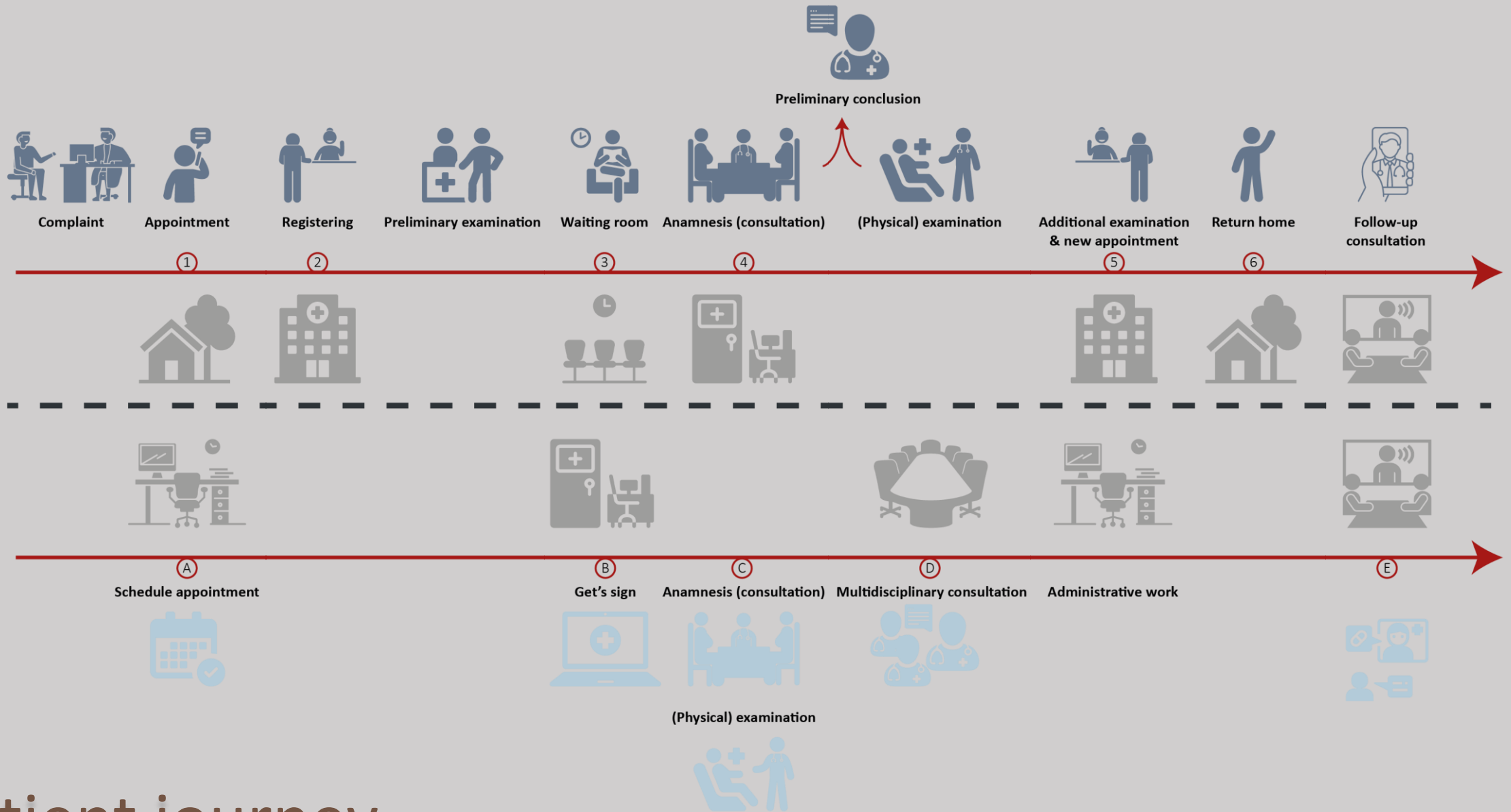
Patient journey

Patient journey

Preliminary conclusion

Complaint — Appointment — Registering — Preliminary examination — Waiting room — Anamnesis (consultation) — (Physical) examination — Additional examination & new appointment — Return home

① ② ③ ④ ⑤ ⑥

Ⓐ Ⓑ Ⓒ Ⓓ

Schedule appointment — Get's sign — Anamnesis (consultation) — Multidisciplinary consultation — Administrative work

(Physical) examination

Patient journey

Patient journey

Conclusion

Future model

	A. My hospital	B. The resilient hospital	C. The healthy society
Organisational	• Dedicated rooms - monofunctional. • No sharing of spaces. • Processes organised per specialism. • Great hierarchy.	• Generic consultation rooms, used by multiple specialisms. • The primary process is uniform for all specialisms.	• Rooms suitable for e-consultations and home monitoring in back office. • Generic consultation rooms, • The process is unified, no different units.
User	• Specialists divided in units. • Permanent workplaces allocated. • Mostly monodisciplinary consultations	• Specialists divided in units • More multidisciplinary consultations • Rooms or facilities are no longer exclusive	• Specialists are divided along care pathways • Mostly multidisciplinary consultations • Specialists sometimes work from home – fewer patient visits. • Rooms or facilities are no longer exclusive
Financial	Same number of resources available. Negotiations with the health insurer on number of DTC's.		
Physical	• Same number of m2 • Counter and waiting area per specialism • Front office and back office are concentrated in the outpatient area	• Same number of m2 • Counter per cluster of specialisms • Waiting is customized • Front and back office are spatially separated	• Fewer number of m2 • Fewer patient visit hospital (virtual) • Waiting is customized • Front and back office are spatially separated

"New digital technologies have shifted our views on health. Mobile apps and sensors are providing a more holistic view of health."

Van den Brink, Hekster & Van der Wilt, 2021

"New digital technologies have shifted our views on health. Mobile apps and sensors are providing a more holistic view of health.

But there are downsides too..."

Van den Brink, Hekster & Van der Wilt, 2021

"New digital technologies have shifted our views on health. Mobile apps and sensors are providing a more holistic view of health.

But there are downsides too.

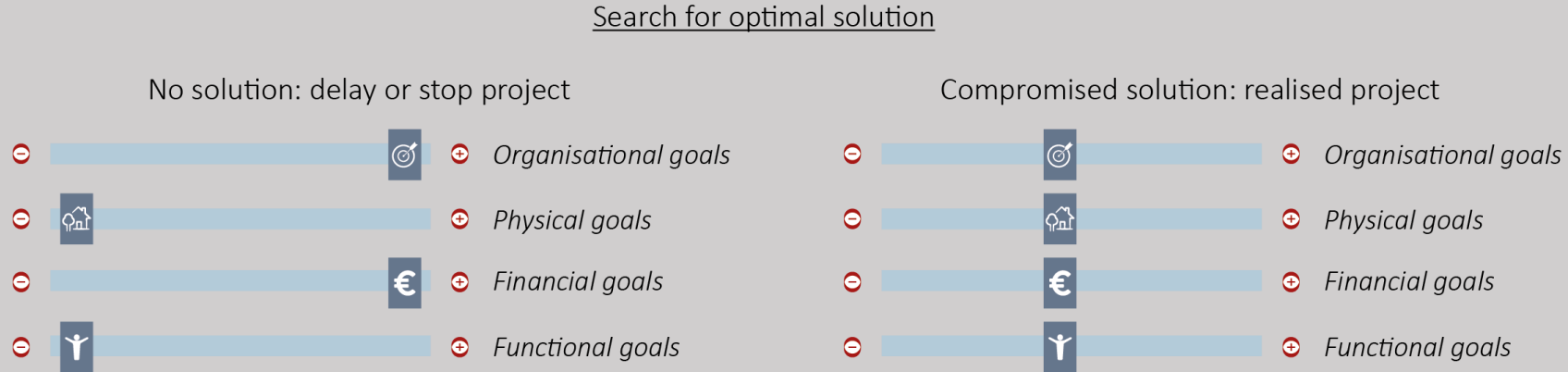*The overdose of online health information and the availability of health checks have led to healthy-but-anxious people. And the concept of the proactive and responsible patient does not lead to more, but rather less autonomy and self-management, critics say."*

Van den Brink, Hekster & Van der Wilt, 2021

Future model

	A. My hospital	B. The resilient hospital	C. The healthy society
Organisational	• Dedicated rooms - monofunctional. • No sharing of spaces. • Processes organised per specialism. • Great hierarchy.	• Generic consultation rooms, used by multiple specialisms. • The primary process is uniform for all specialisms.	• Rooms suitable for e-consultations and home monitoring in back office. • Generic consultation rooms, • The process is unified, no different units.
User	• Specialists divided in units. • Permanent workplaces allocated. • Mostly monodisciplinary consultations	• Specialists divided in units • More multidisciplinary consultations • Rooms or facilities are no longer exclusive	• Specialists are divided along care pathways • Mostly multidisciplinary consultations • Specialists sometimes work from home – fewer patient visits. • Rooms or facilities are no longer exclusive
Financial	Same number of resources available. Negotiations with the health insurer on number of DTC's.		
Physical	• Same number of m2 • Counter and waiting area per specialism • Front office and back office are concentrated in the outpatient area	• Same number of m2 • Counter per cluster of specialisms • Waiting is customized • Front and back office are spatially separated	• Fewer number of m2 • Fewer patient visit hospital (virtual) • Waiting is customized • Front and back office are spatially separated

Mindset change

Search for optimal solution

No solution: delay or stop project

Organisational goals

Physical goals

Financial goals

Functional goals

Compromised solution: realised project

Organisational goals

Physical goals

Financial goals

Functional goals

(Den Heijer, 2021)

"This really is a mindset change! Improvement starts with creating insight and awareness, that is the most important, this will then follow by the willingness to change "

(Expert panellist, 2021)

Mindset change

No solution: delay or stop project

Compromised solution: realised project

- Organisational goals
- Physical goals
- Financial goals
- Functional goals

- Organisational goals
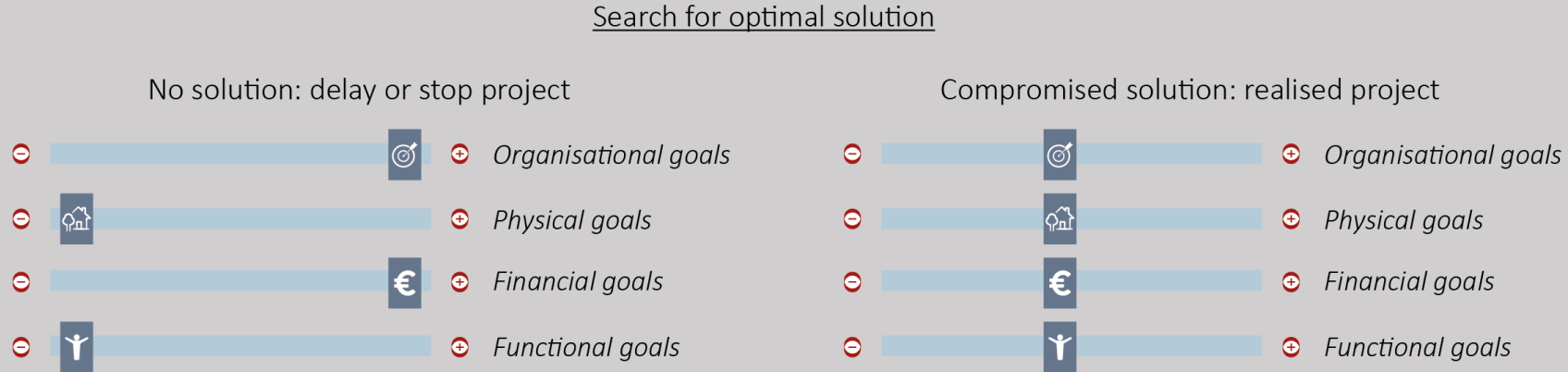- Physical goals
- Financial goals
- Functional goals

(Den Heijer, 2021)

"This really is a mindset change! Improvement starts with creating insight and awareness, that is the most important, this will then follow by the willingness to change "

(Expert panellist, 2021)

Generating information ⟶ Feedback loop ⟶ Improvements

Information dashboard
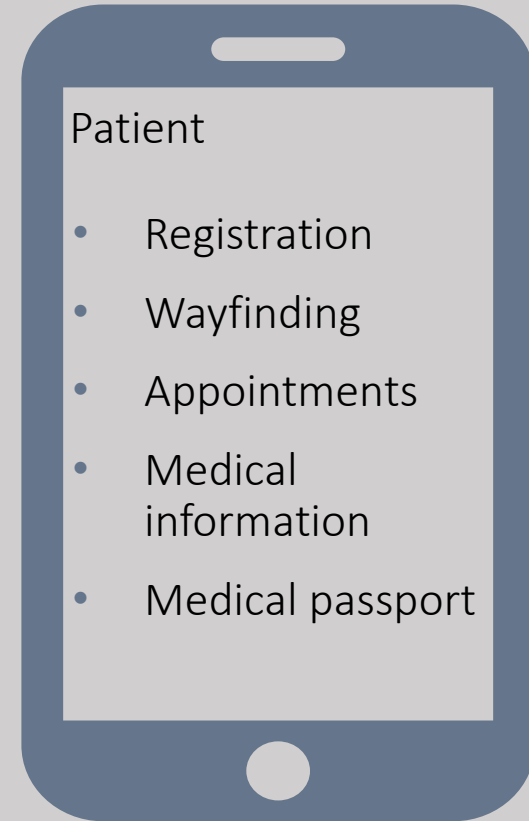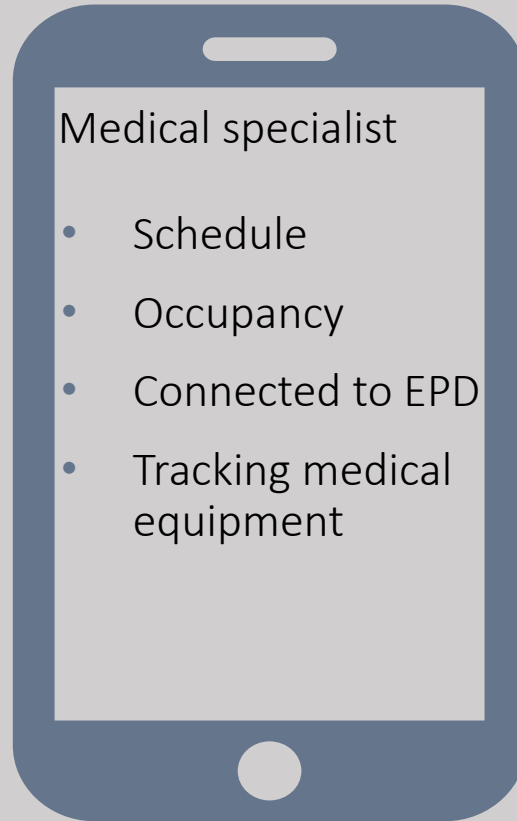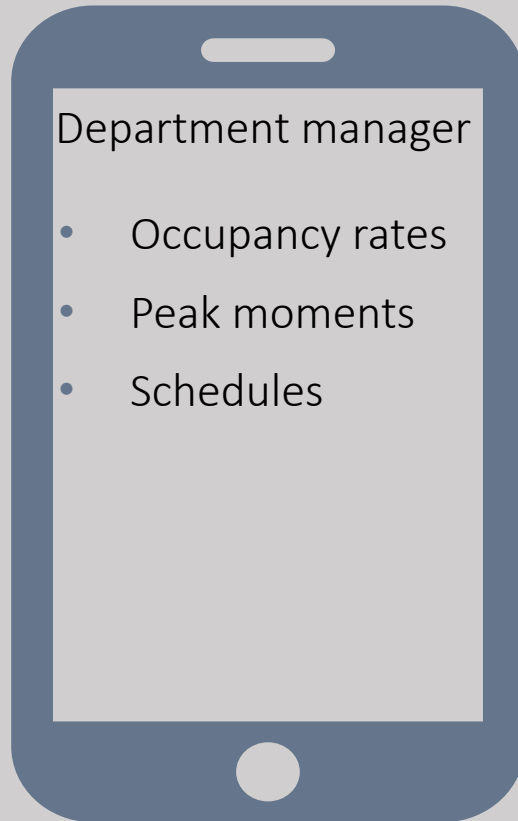
Department manager

- Occupancy rates
- Peak moments
- Schedules

Medical specialist

- Schedule
- Occupancy
- Connected to EPD
- Tracking medical equipment

Patient

- Registration
- Wayfinding
- Appointments
- Medical information
- Medical passport

Conclusion

To what extent can smart tools & layout contribute to a more efficient and effective use of scarce resources in the outpatient department of a Dutch hospital?

Recommendations

Recommendations

Future research

- Uniformity in the hospital
- More in depth research on a specific area
- Cost and time of implementation
- In depth research per specialism
- Change of the scope

Practice

- Include the users
- Pilot projects
- Security risks and privacy
- One platform only or link multiple platforms
- Don't be digitally dependent
- Learn from other sectors

"Smart technology is a means to an end,
but not an end in itself"

- Thijs Wichers

Questions?

References

- Den Heijer, A. C. (2021). *Campus of the future. Managing a matter of solid, liquid and gas* (1st ed.). TU Delft.

- Valks, B., Arkesteijn, M & den Heijer, A. (2018). Smart campus tools 2.0: An international comparison. Delft University of Technology

- Speet, A. (2020). Integraal capaciteitsmanagement in het ziekenhuis. En de kracht van een Hospital control center. (whitepaper). *Performation*. Published.

- Ministerie VWZ (2018). Themaverkenningen. https://www.vtv2018.nl/themaverkenningen

Extra slides

Conclusion

To what extent can ... more efficient and effective use of sca... artment of a Dutch

Ernst Kuipers gelooft heilig in samenwerking en concentratie

Bart Kiers

De zorgbestuurder Ernst Kuipers is voorstander van intensieve samenwerking en verdergaande concentratie van zorg. De marktwerking werkt in zijn ogen allang niet meer. Het idee van vrijgevestigde specialismen 'gaan we langzaam buiten de deur zetten'. De speerpunten van Kuipers bij elkaar geveegd.

Foto: Paul Tolenaar

'Concentratie van zorg'

'Digitalisering en centrale regie'

'Marktwerking passé'

'Vrijgevestigd medisch specialisten'

Discussion & Limitations

Discussion & limitations

Discussion

- The research has provided insights in how smart tools and layout can contribute to an efficient use of space in the OD

- It showed how only the adjustment of layout is not enough, and a compromised solution is important

- The hospital is a traditional organization, this should be considered when implementing innovations (smart tools)

- The human touch of healthcare should be considered

Limitations

- Timeframe, only limited number of cases.

- Complex organisation, implementation is a research on itself

- Culture of the organisation, a sensitive topic

- Smart tools have not yet, or very recently been implemented.

Selection criteria

Case study

- Industry: hospital real estate
- Project: outpatient department (OD)
- Location: situated in the Netherlands
- Specification: real-time data could be measured
- Specification: provide insight in ICT-structure
- Specification: various specialisms are located in the OD

Expert panel

- The panellist has experience in healthcare real estate
- The panellist has experience in the outpatient department of a Dutch hospital
- The panellist has experience with integral capacity management (ICM)
- The panellist has not been involved in this research or in one of the case studies

Panellists: AT Osborne, senior consultant - AT Osborne, consultant - AMC capacity manager

Expert panel

- Statement 1: The primary process must become more uniform between the various specialisms. So the outpatient department becomes more of a single entity and consists of fewer 'independent islands'.

- Statement 2: A flexible concept (separation of front office and back office & generic consultation/examination rooms) should be better utilised between different specialisms, as is already the case within the specialism.

- Statement 3: The implementation of smart tools is more successful as the layout of the outpatient department becomes more flexible.

- Statement 4: The Covid19 pandemic is accelerating the implementation/acceptance of smart technologies.

Added value

Increase innovation

Increase user satisfaction - - - → *People* → *User-value*

Improve culture

Improve productivity

Nine added values of real estate → Reduce cost - - - → *Production* → *Production-value*

Improve flexibility

Support image

Improve financial position and controlling risks - - - → *Place* → *Future-value*

Sustainability