

DCA

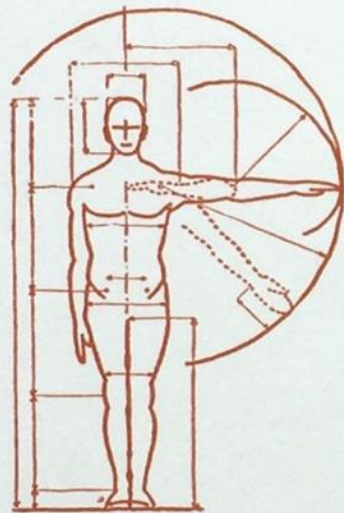
DCA



*“A bad workman
always blames his tools”*

*“Het ligt niet aan het
gereedschap maar aan de
handjes die het vast houden”*

DESIGNING



Simon and Schuster, New York, 1955

FOR PEOPLE

We bear in mind that the object being worked on is going to be ridden in, sat upon, looked at, talked into, activated, operated, or in some other way used by people individually or en masse.

When the point of contact between the product and the people becomes a point of friction, then the industrial designer has failed.

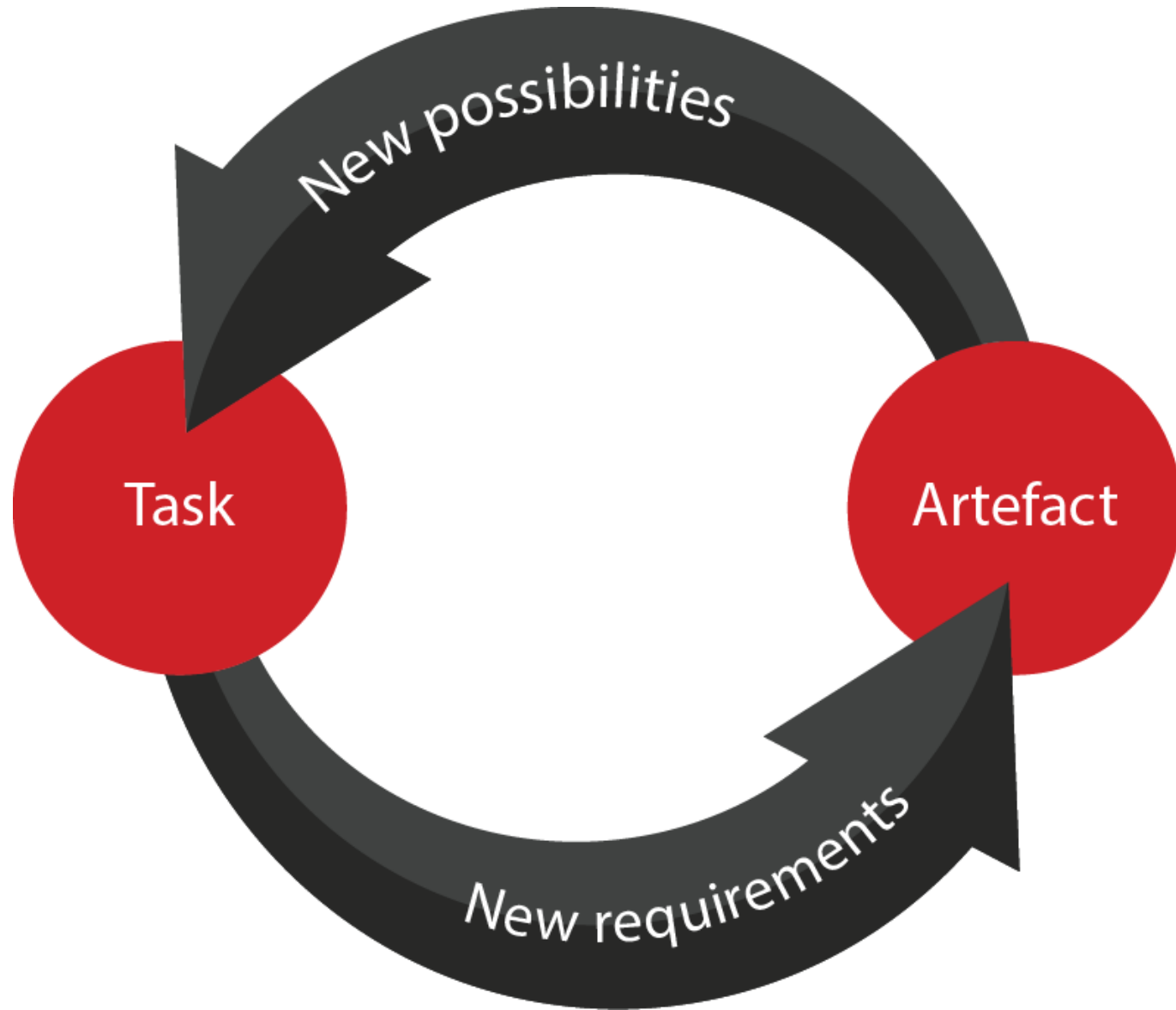
On the other hand if people are made safer, more comfortable, more eager to purchase, more efficient—or just plain happier—by contact with the product, then the designer has succeeded.

by HENRY DREYFUSS

Revolution?

DCA





Domain purpose

(to design for people, to improve system performance)

Domain values

(optimising safety, efficiency, effectiveness, inclusiveness, satisfaction, flexibility)

Domain functions

(to inspire, inform, evaluate products and services)

Physical functions

(to understand, measure, describe)

Physical objects

(tools, methods, processes)

Evolution

Revolution

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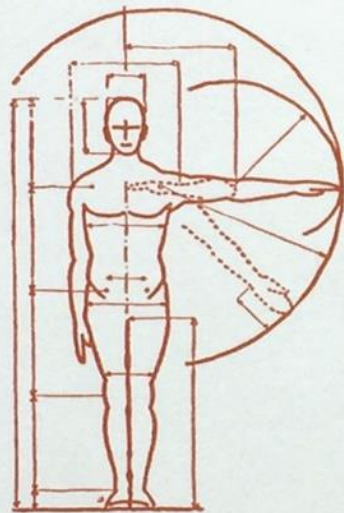
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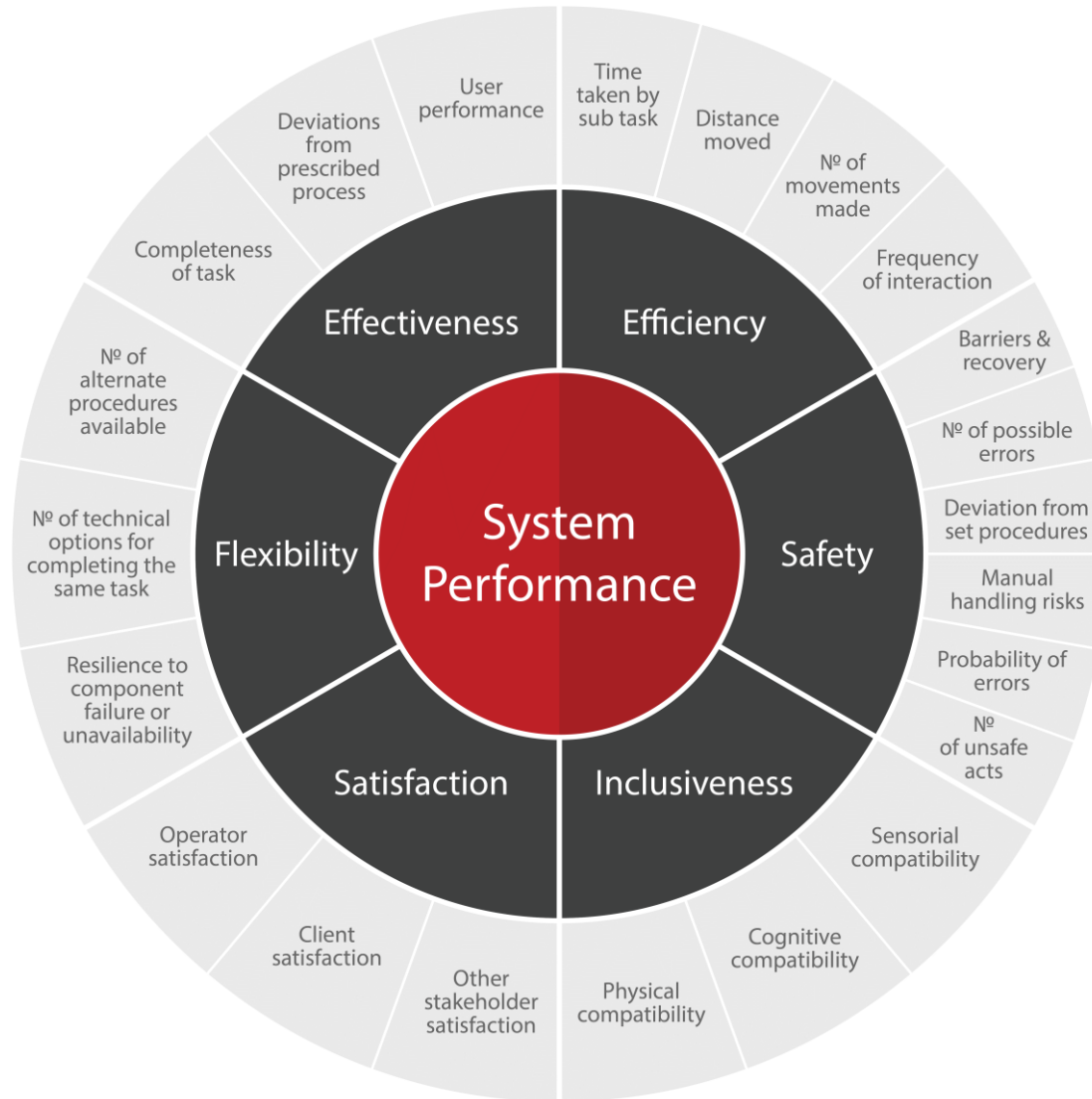
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or service

by HENRY DREYFUSS



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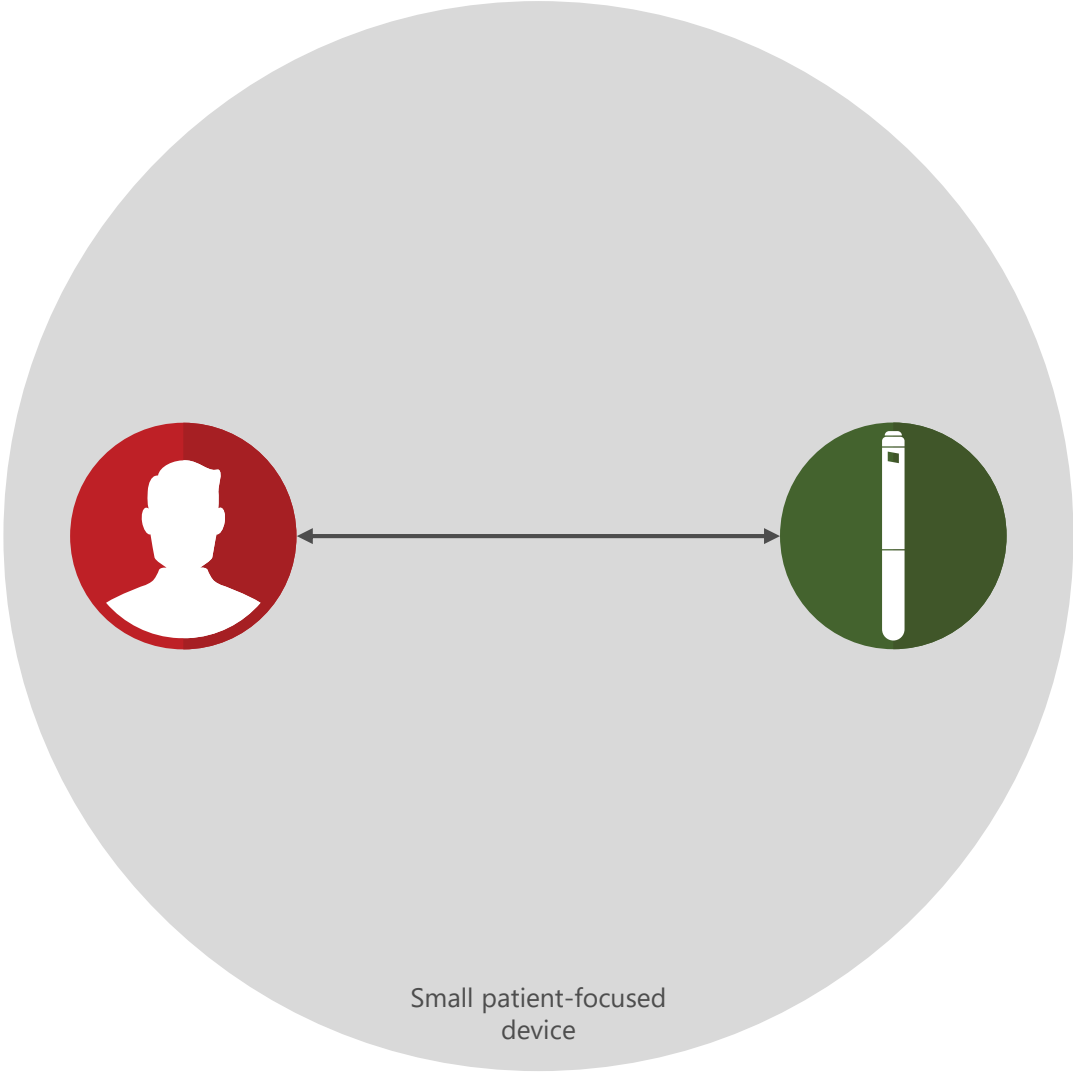
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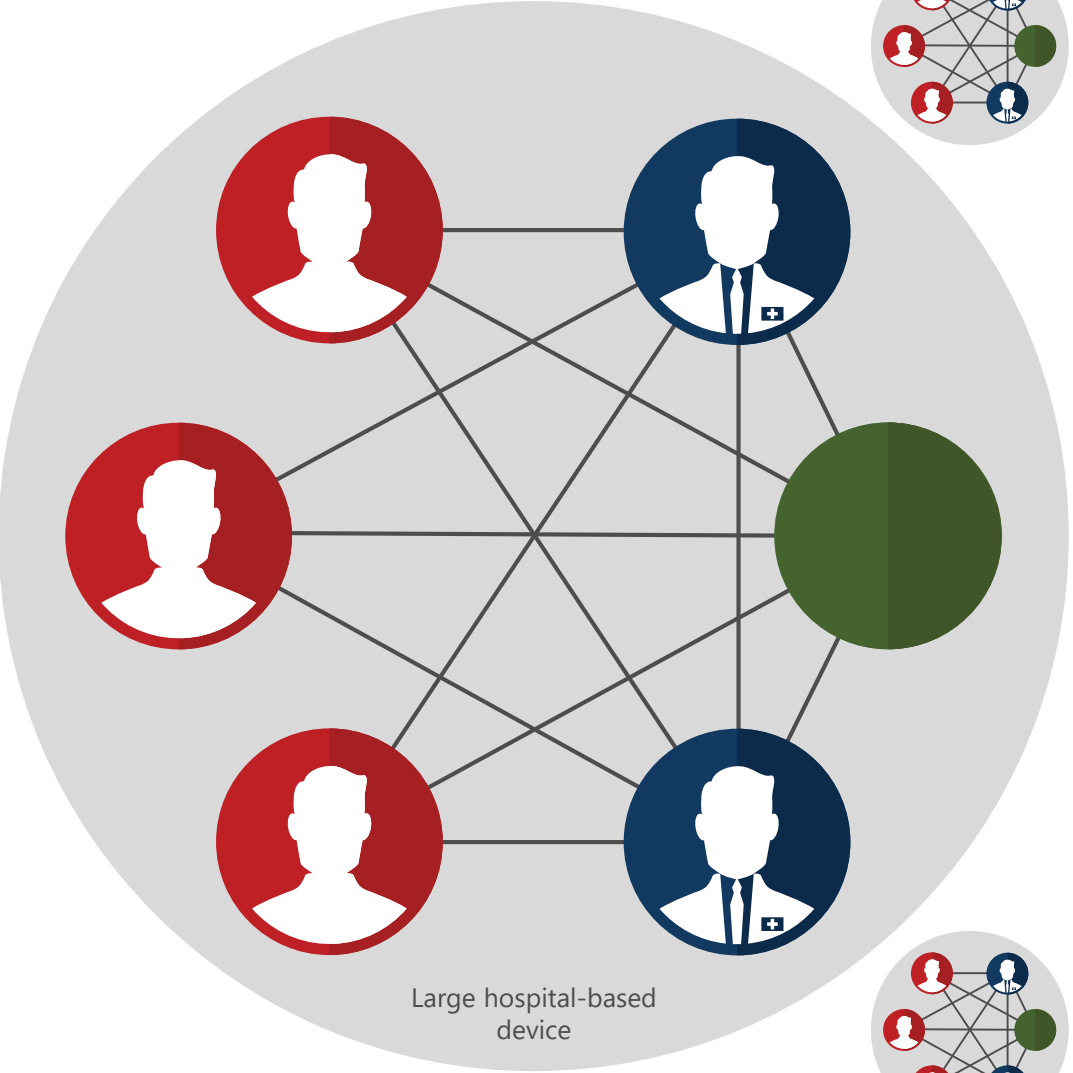
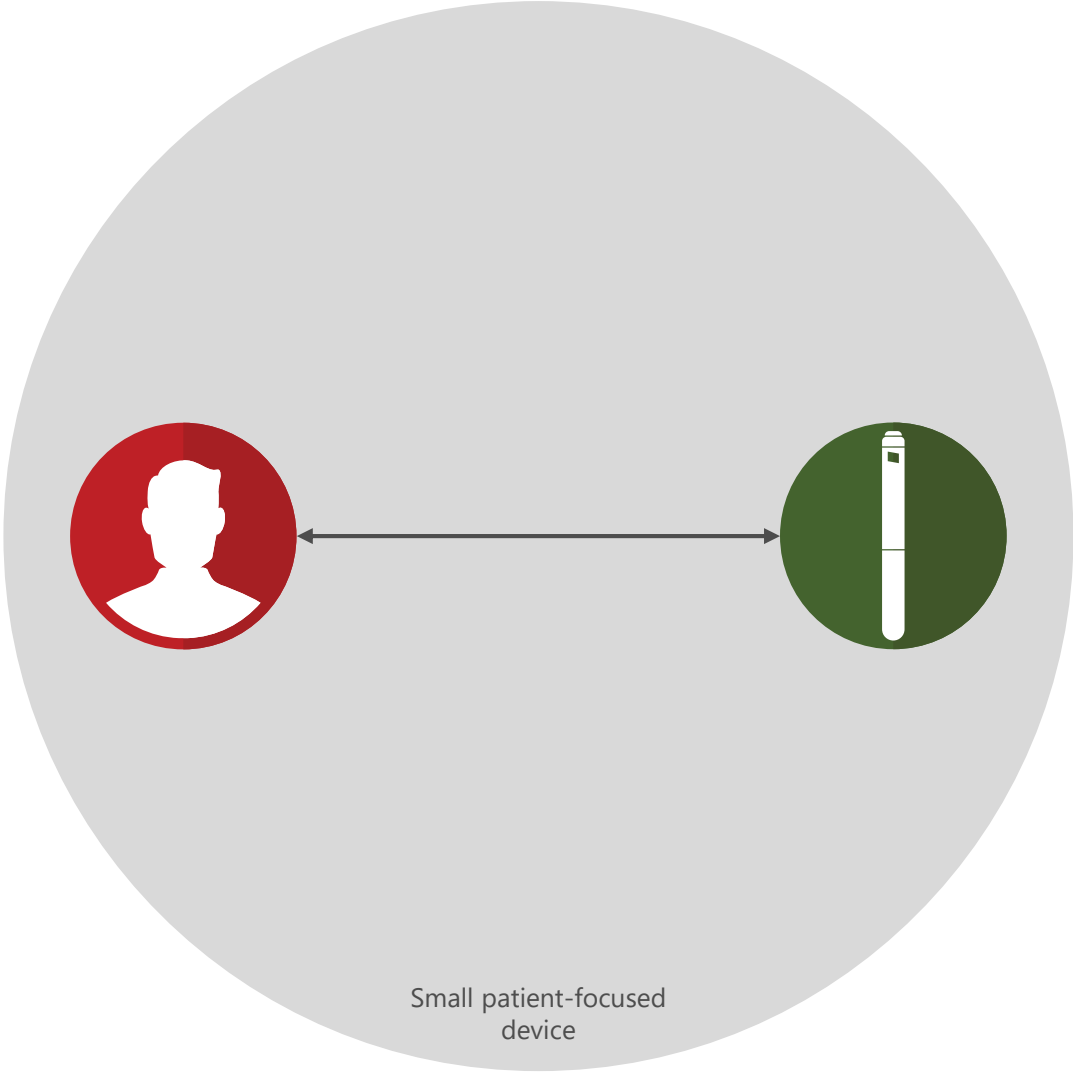
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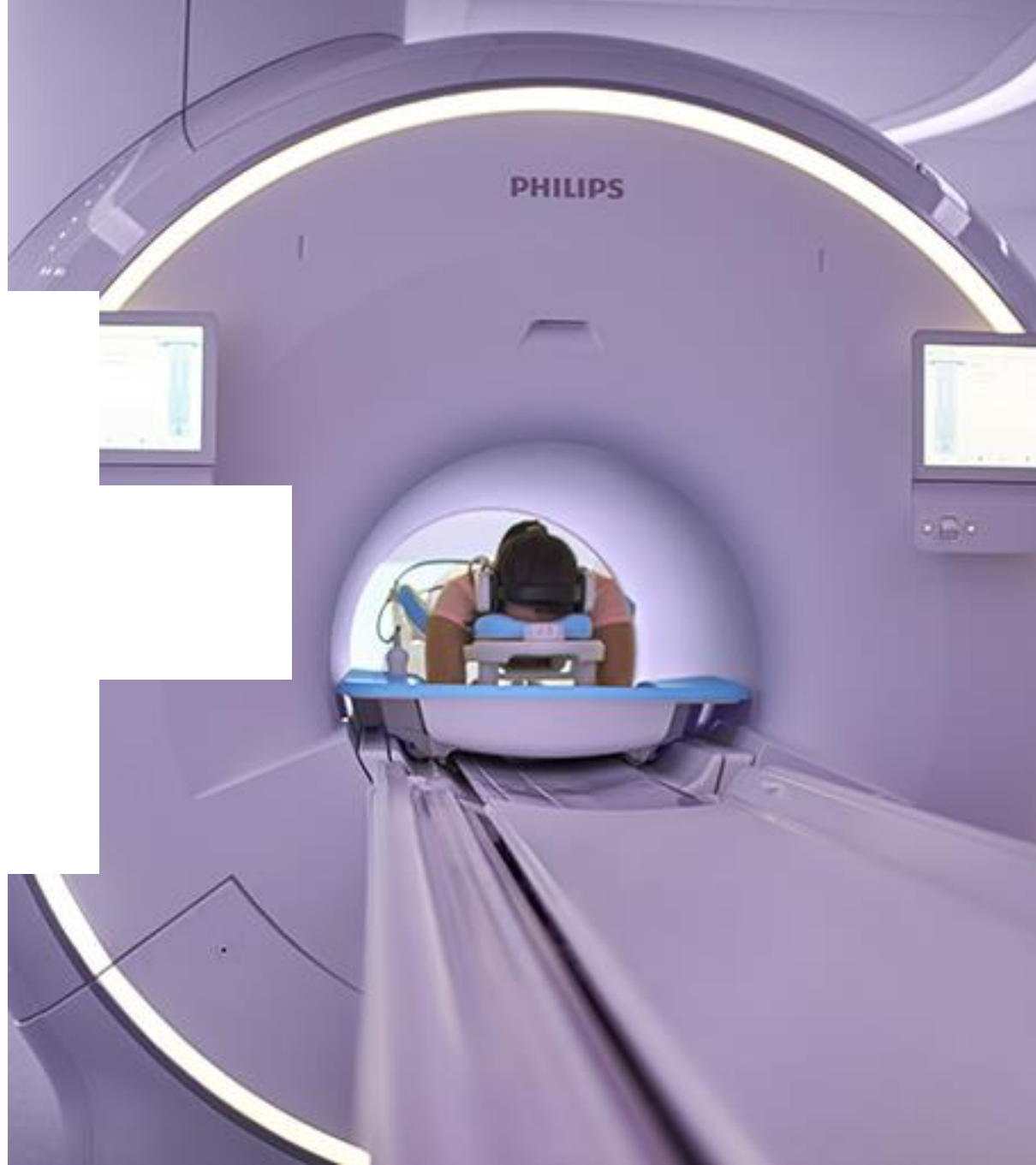
Revolution

Designs that are:

*Inspired by
Informed by
Evaluated against*

An evidence base from Human Factors methods





Data
collection

Analysis

Design

The vision

Data collection



DCA worked with Elekta on this project between 2010 and 2012 creating an evidence-base built from:

- 7 treatment sites visited worldwide
- Over 90 hours of observation at treatment centres (~360 treatment sessions)
- 30 interviews with healthcare professionals worldwide (fieldwork and phone interviews)
- 23 interviews with Elekta internal stakeholders from business, clinical specialists, technical, complaints, training, safety, regulatory and marketing
- 2 tradeshow visits

Field work

Observing approximately 360 treatments across seven treatment sights.

After-hours interviews and walkthroughs.

Two researchers following the workflow in the treatment room and the control room.



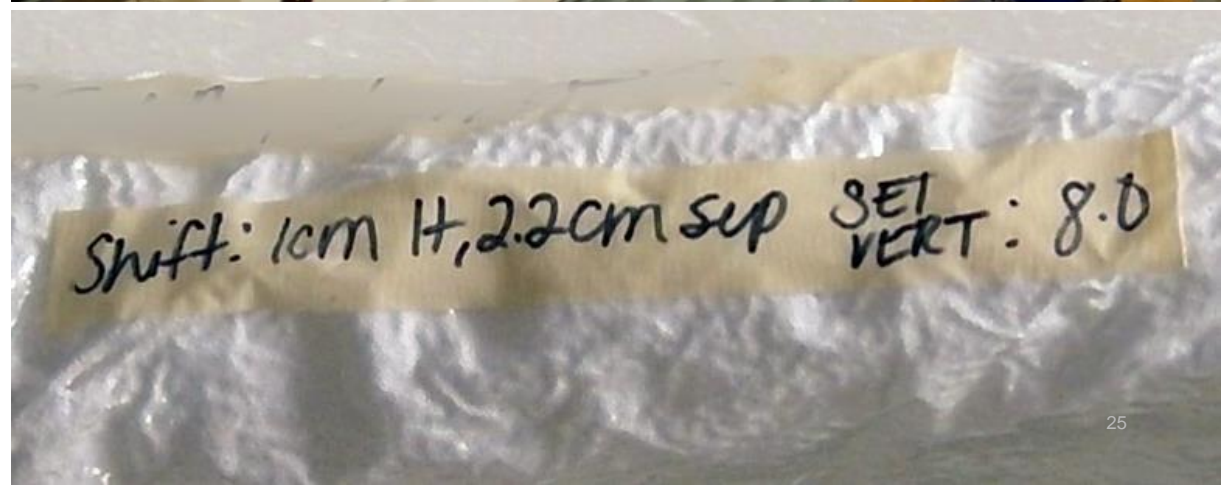


Latent needs

Access to information at the point of use

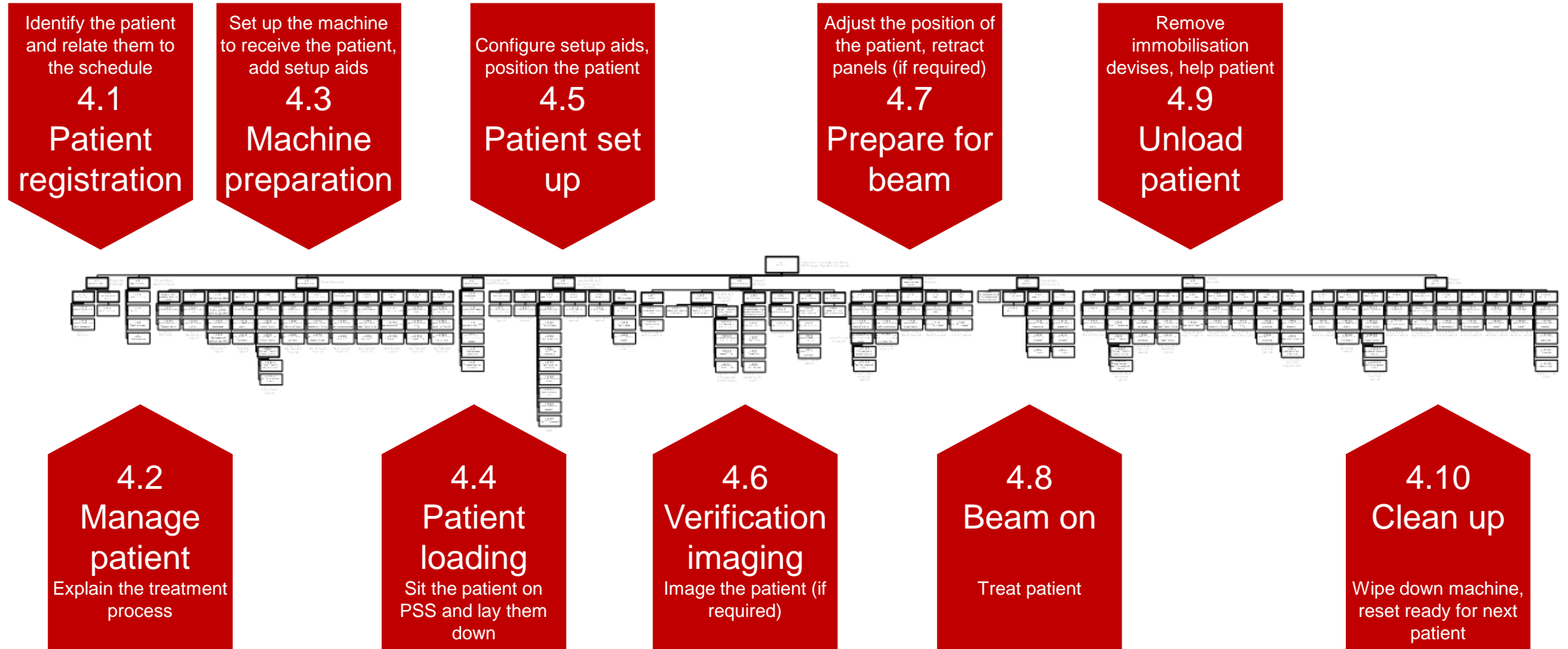
Pressure on throughput

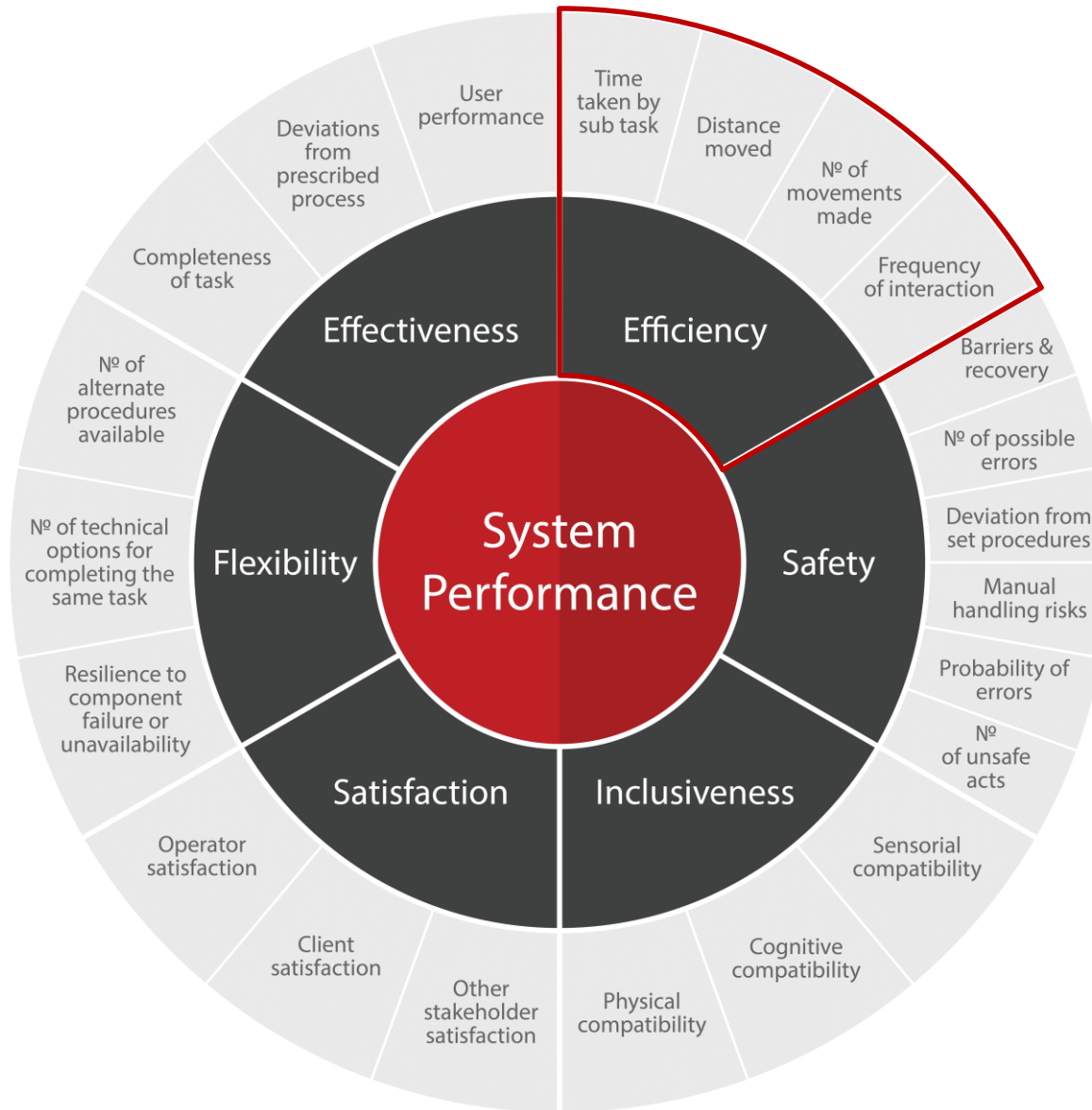
Manual handling



Analysis

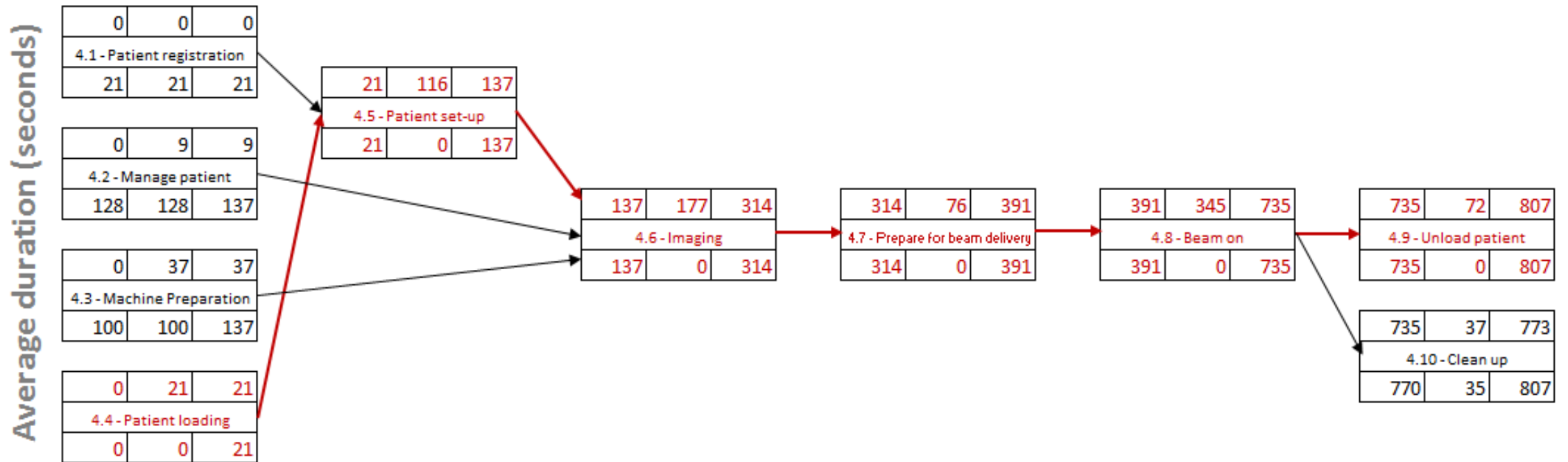
Hierarchical task analysis (HTA)



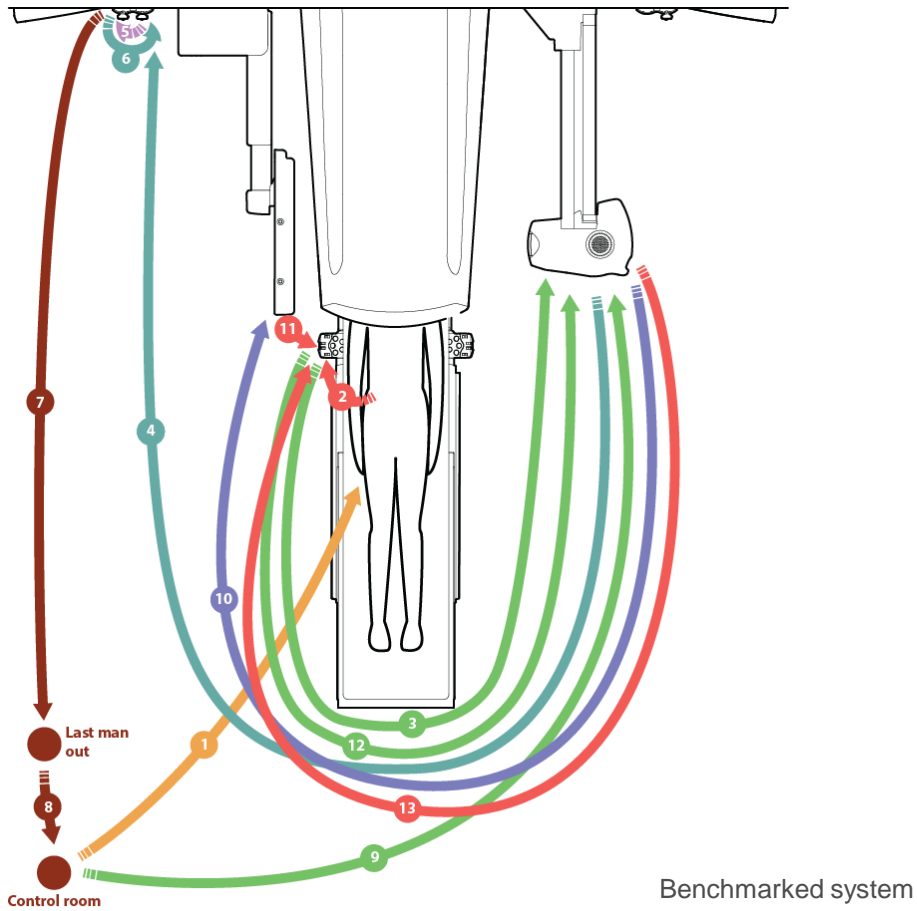


Critical path analysis (PERT charts)

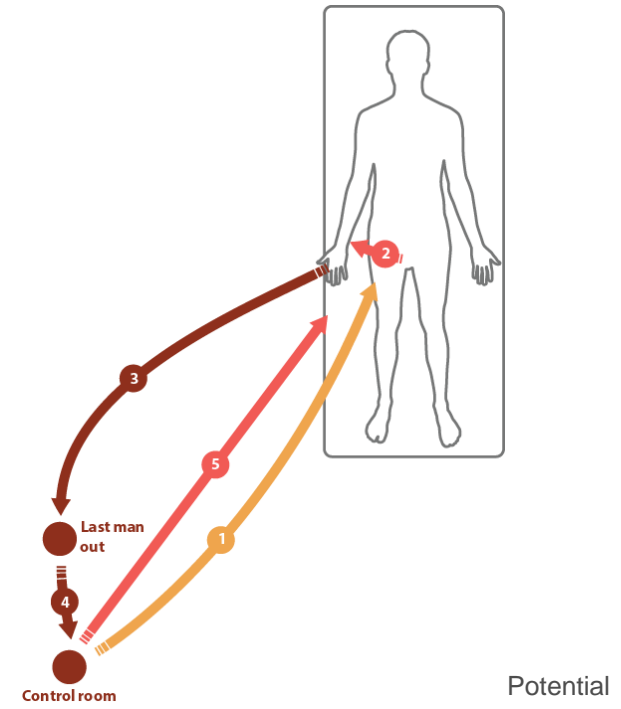
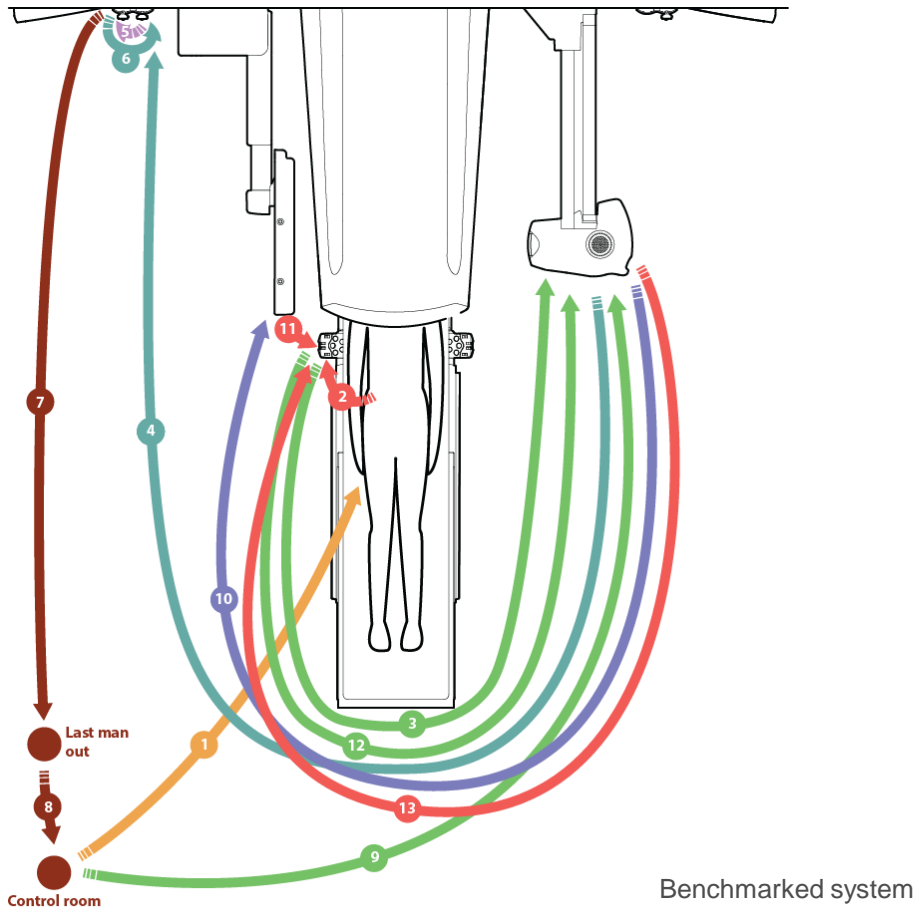
This chart shows average task completion times broken down by stages (as described in the HTA)

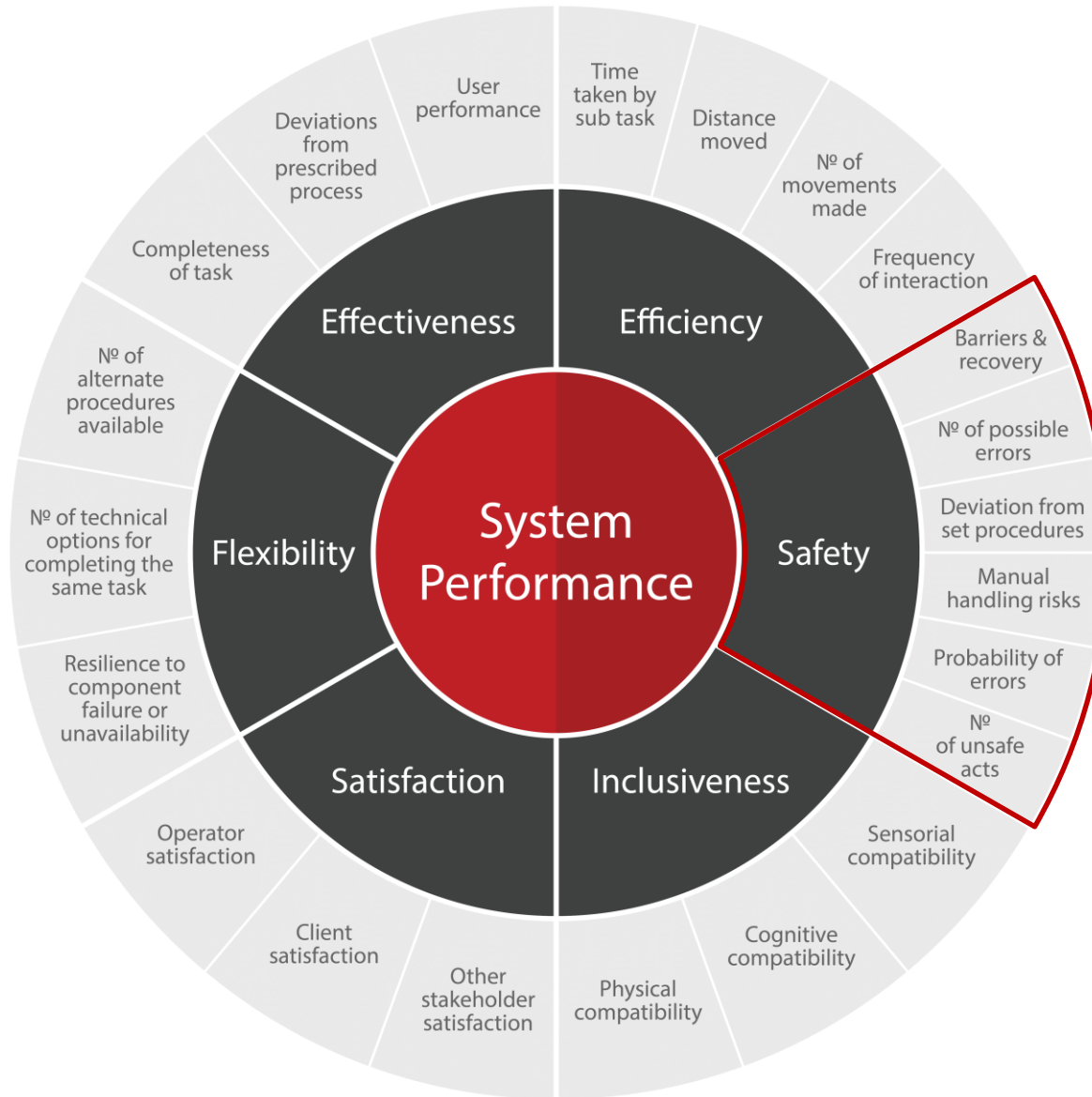


Link analysis



Link analysis





1: Neck Position

Neck twisted

Neck side bending

6: Upper Arm Position

Shoulder is raised

Upper arm is abducted

Arm is supported or leaning

2: Locate Trunk Position

Trunk twisted

Trunk side bending (combined maximum of +1)

Step 7: Lower Arm Position

3: Legs

Bilateral Unilateral

Step 8: Wrist Position

Wrist bent from midline or twisted

4: Add Force/Load Score

- If Load < 5kgs: +1
- If Load is 5 to 10kgs: +0
- If load >10kg: +1

Rapid shock or build up of force

Step 9: Activity Score

1 or more body parts are held longer than a minute (static)

Repeated small range actions (more than 4x per minute)

Action causes rapid large change in posture

5: Add Coupling Score

- Good: Well fitted handles and mid range power grip
- Fair: Acceptable but not ideal hold or coupling acceptable with another body part
- Poor: Hand hold not acceptable but possible
- Unacceptable: No handles, awkward, unsafe

Score	Risk Level	Action
1	Negligible	None necessary
2-3	Low	May be necessary
4-7	Medium	Necessary
8-10	High	Necessary soon
11-15	Very High	Necessary now



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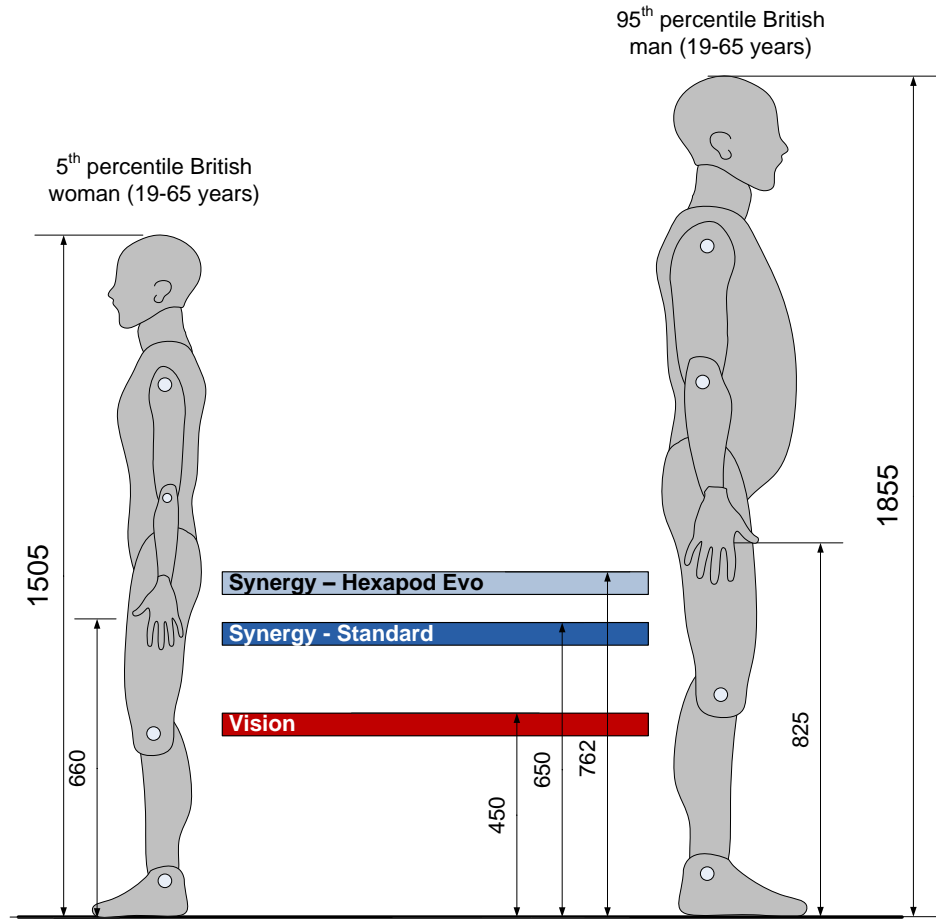
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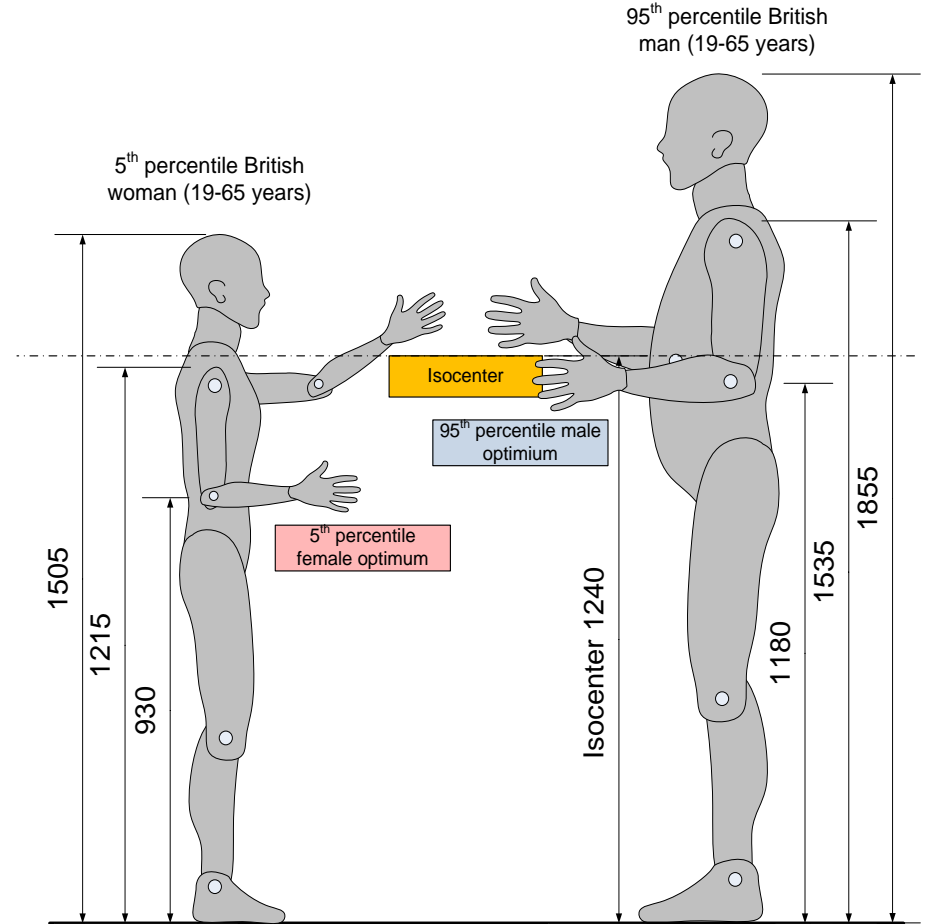
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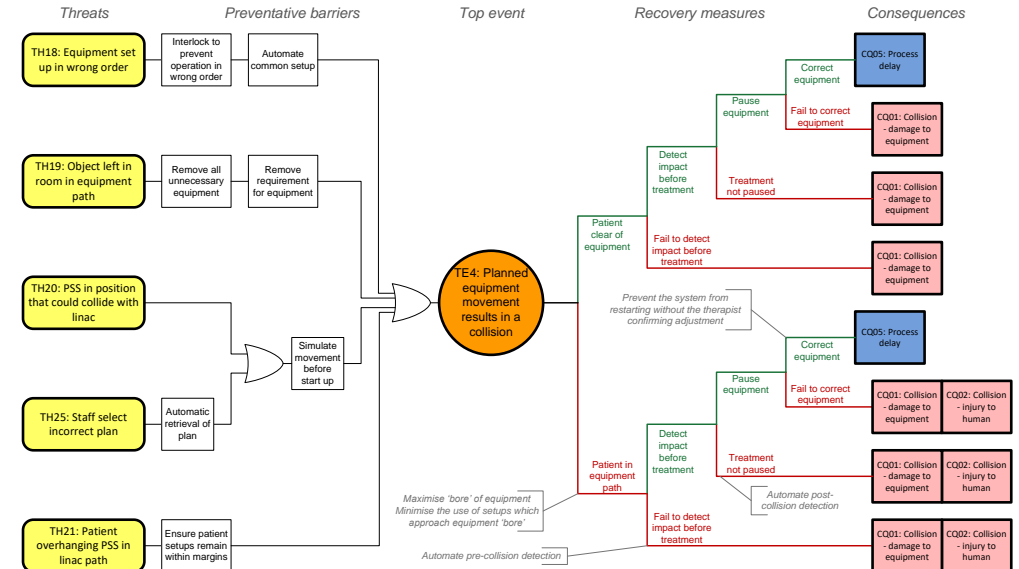
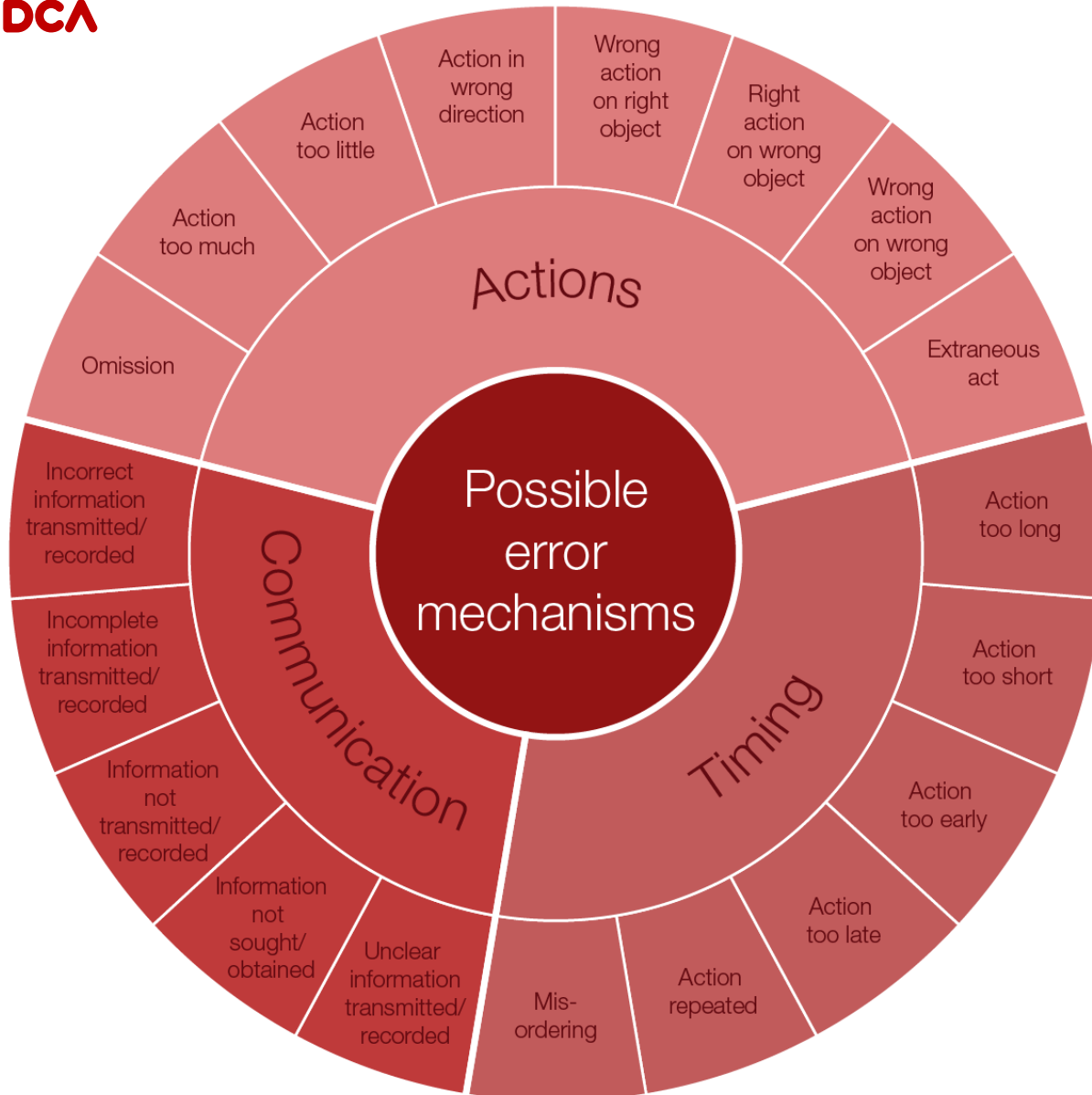
3

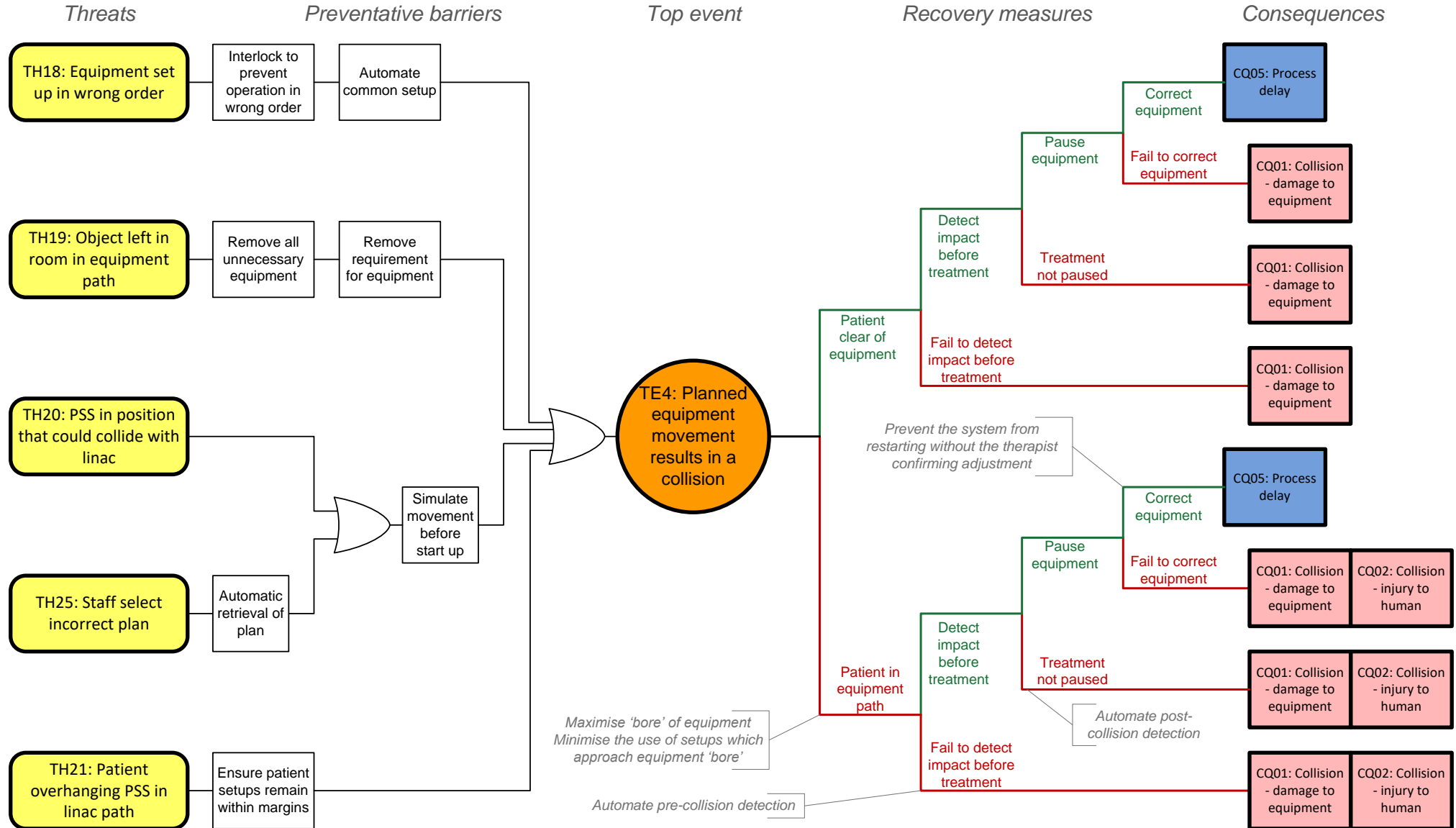


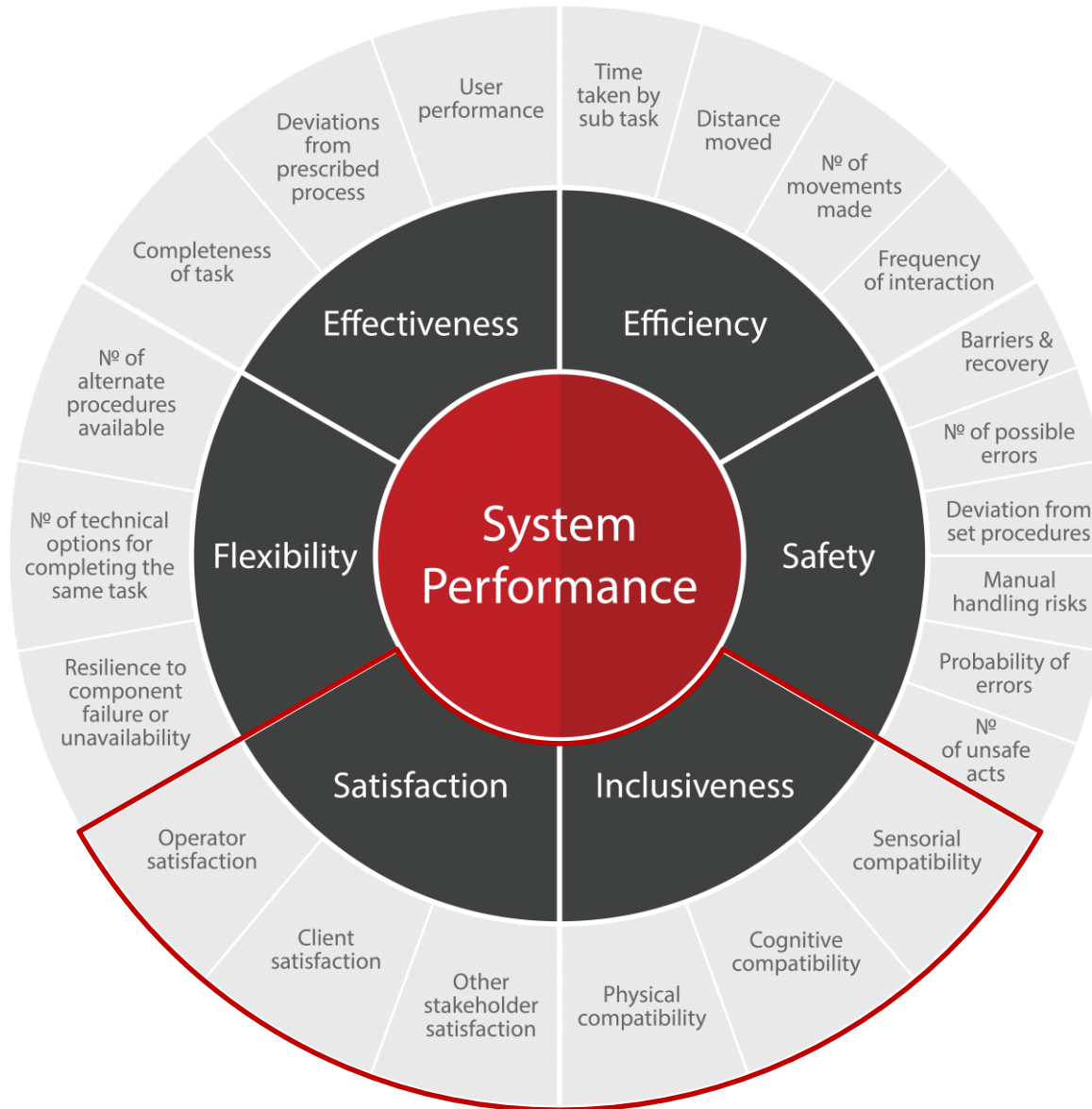
All dimensions in mm, based upon Pheasant & Haslegrave (2006) Table 10.1, without shoes

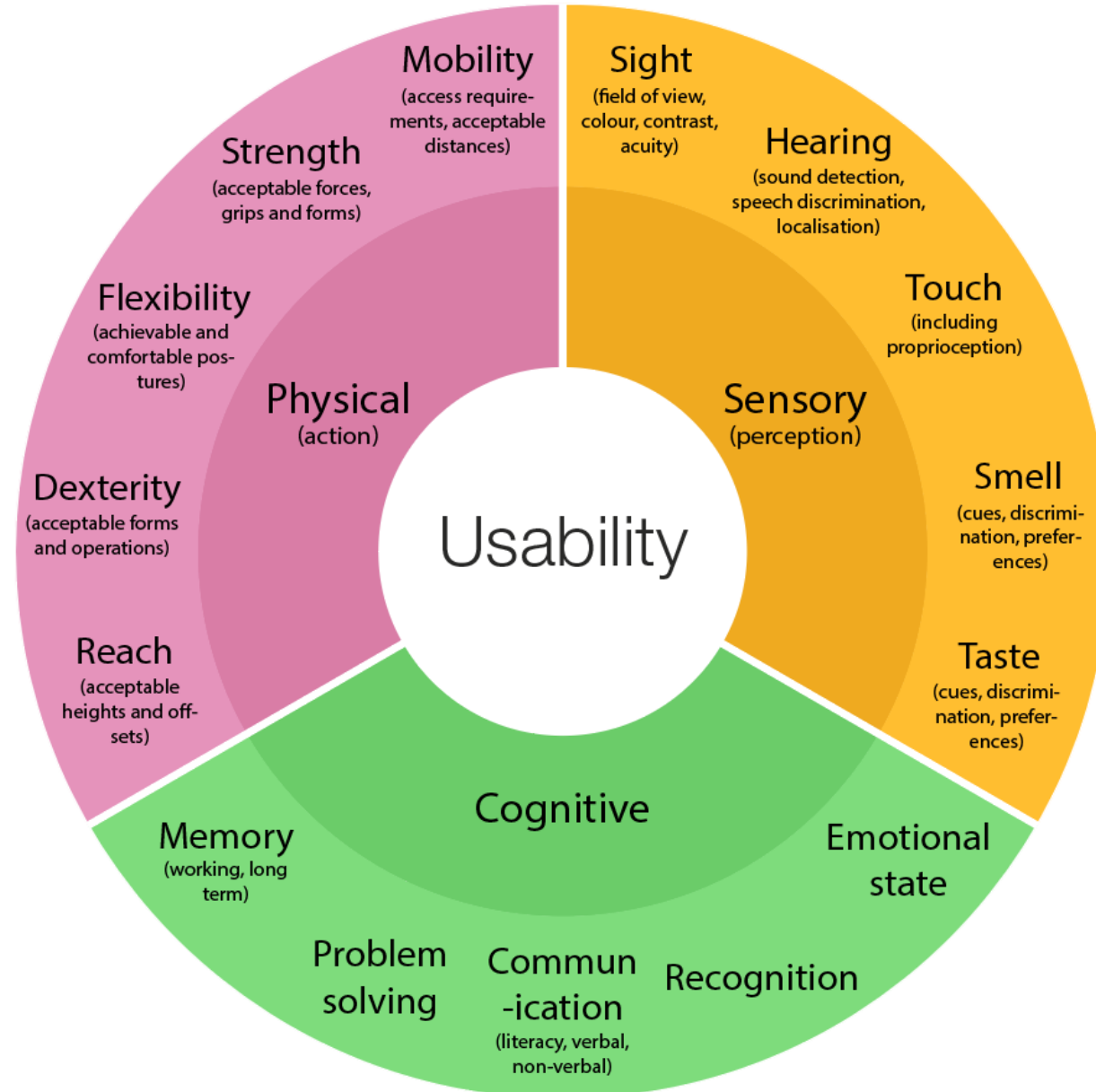


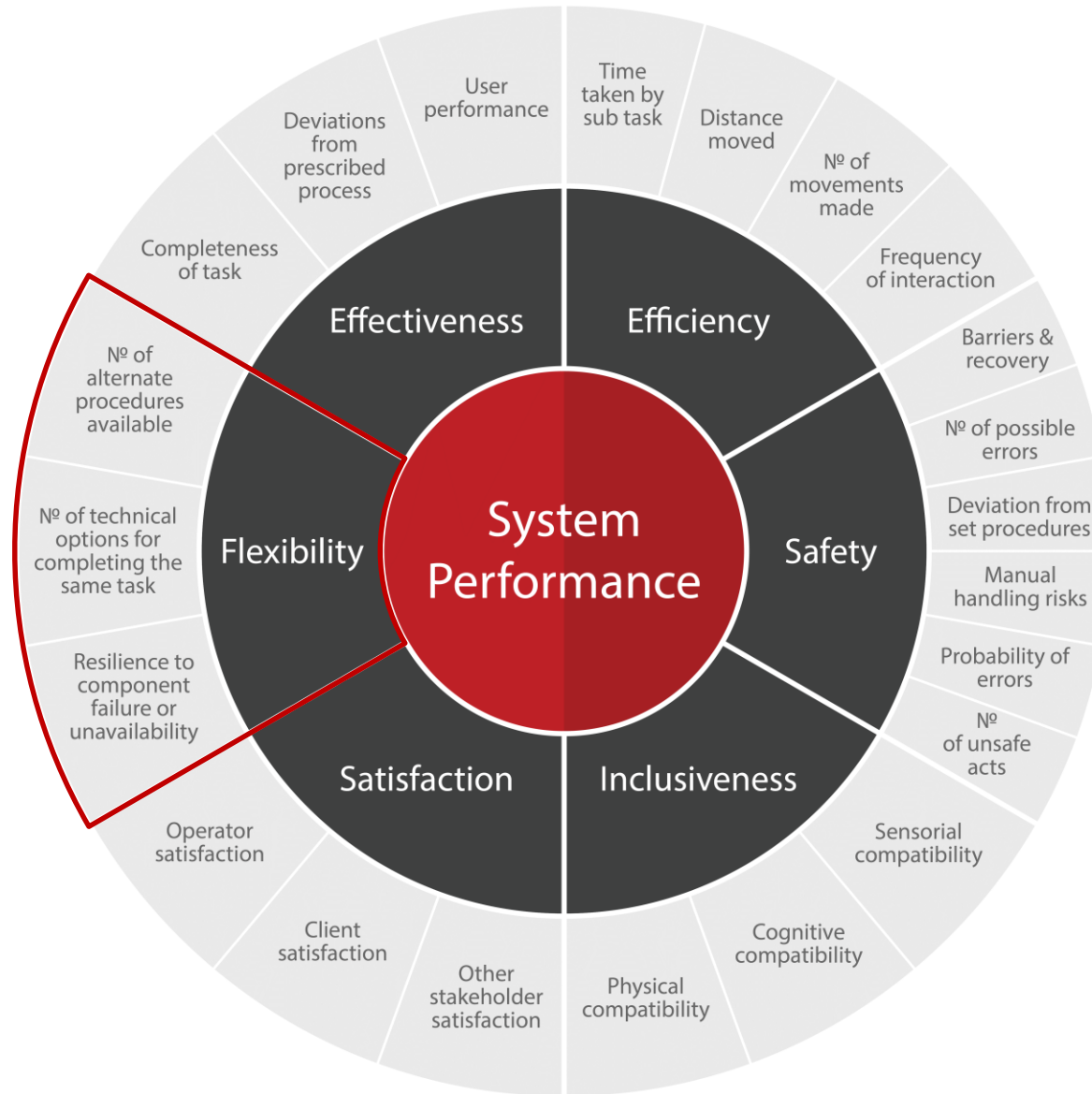
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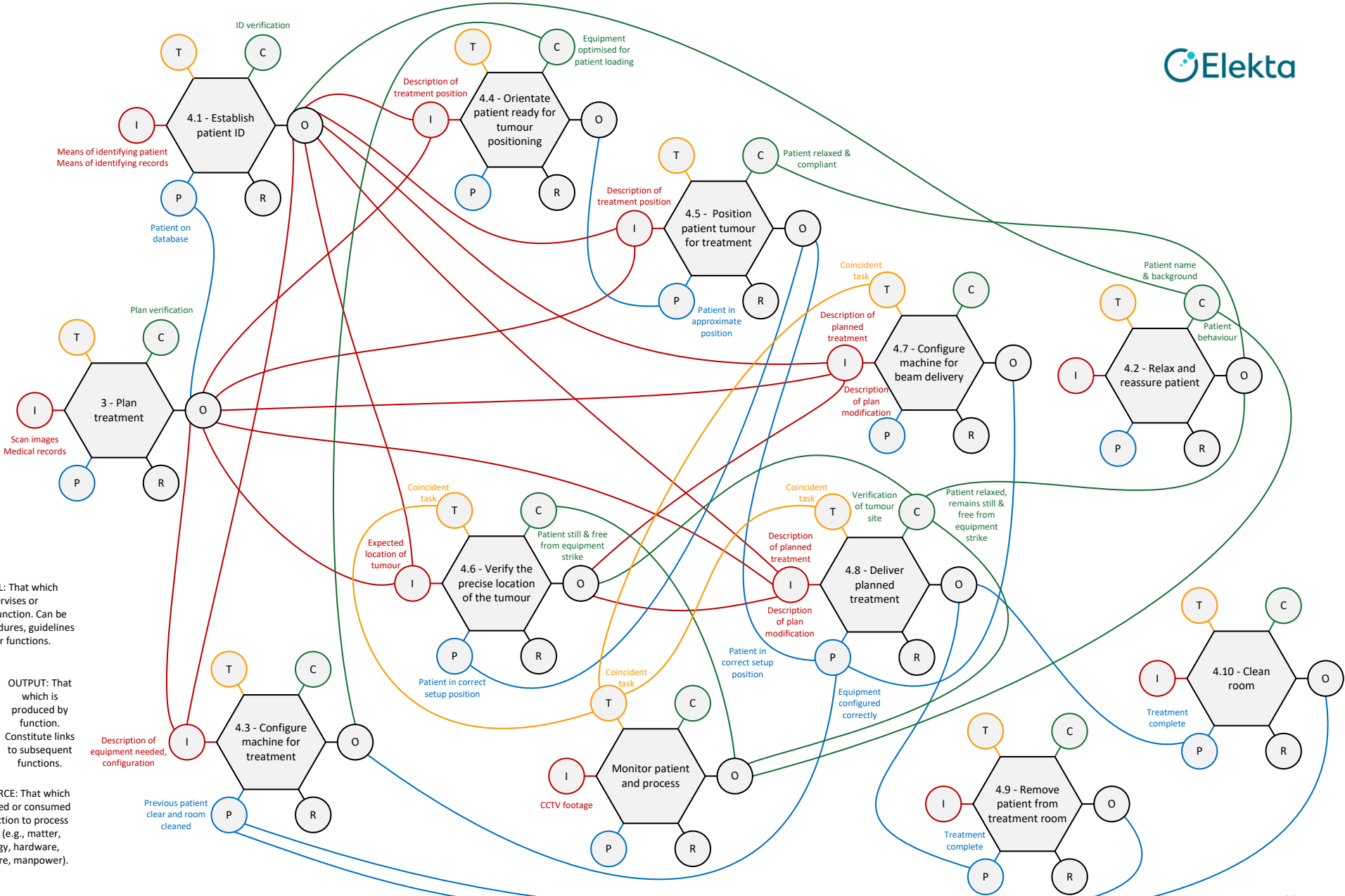








FRAM



TIME available: This can be a constraint but can also be considered as a special kind of resource.

CONTROL: That which supervises or adjusts a function. Can be plans, procedures, guidelines or other functions.

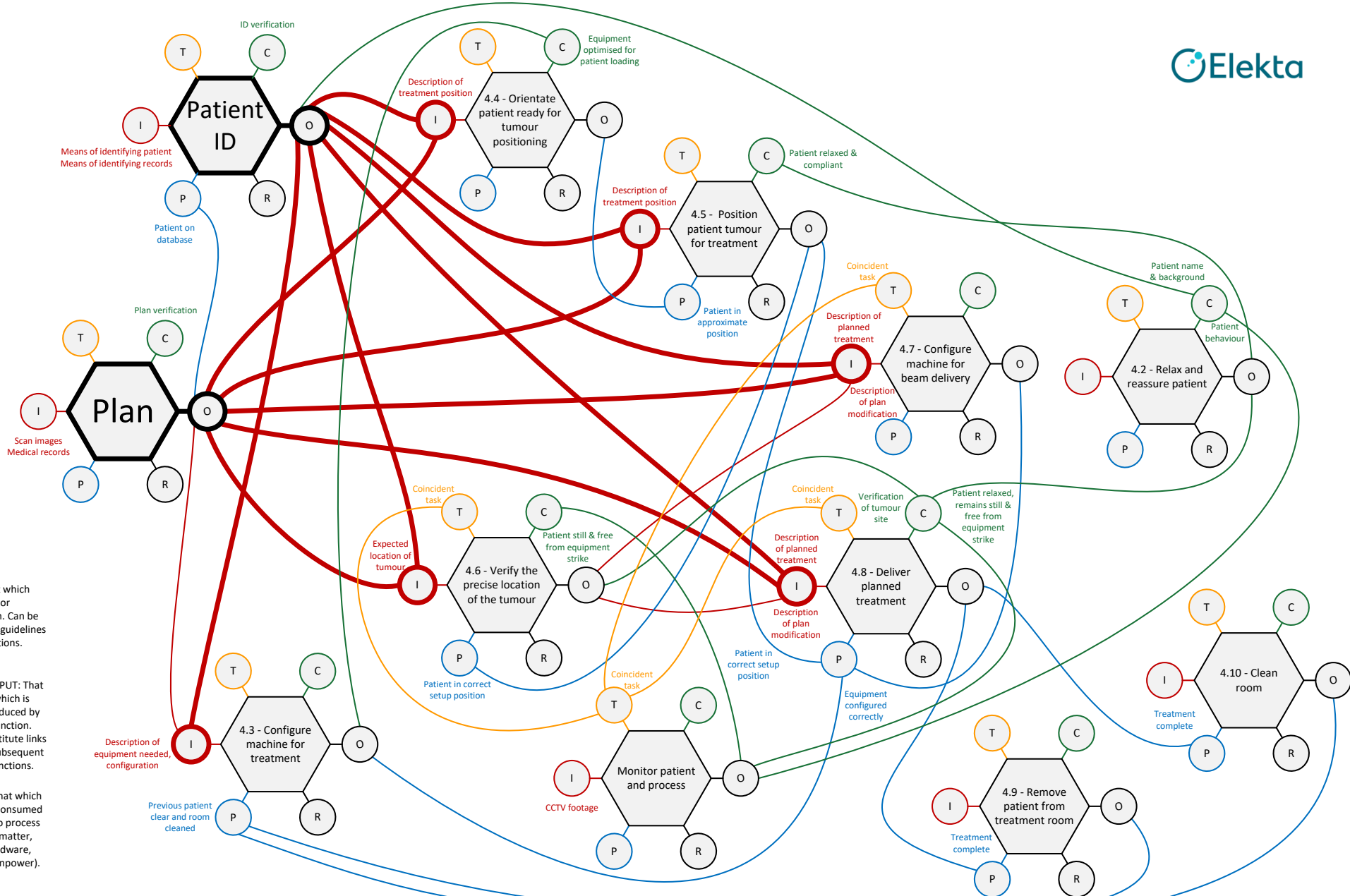
OUTPUT: That which is produced by function. Constitute links to subsequent functions.

RESOURCE: That which is needed or consumed by function to process input (e.g., matter, energy, hardware, software, manpower).

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PRECONDITION: System conditions that must be fulfilled before a function can be carried out.

FRAM



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1.
What
information is required?

2.
When
it needs to be displayed?

3.
Where
it should be displayed?

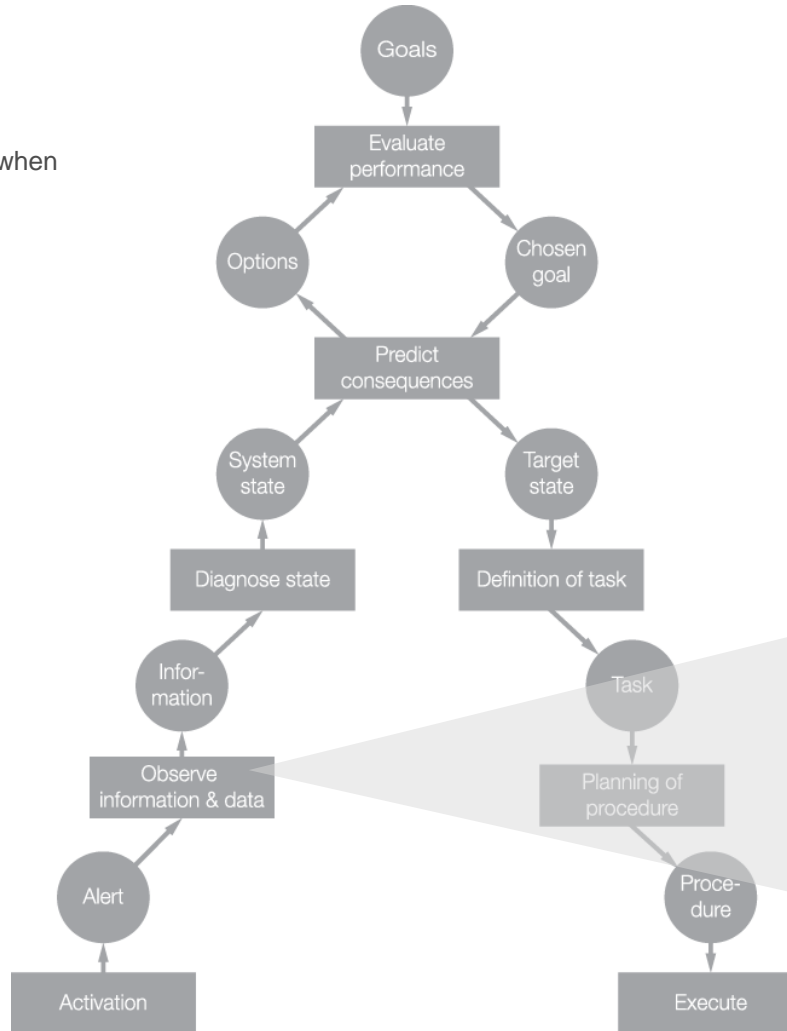
4.
Who
it should be displayed to?

5.
How
in what format?



Decision ladders

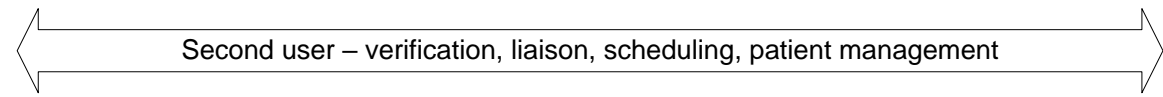
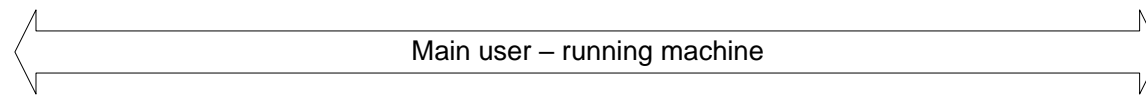
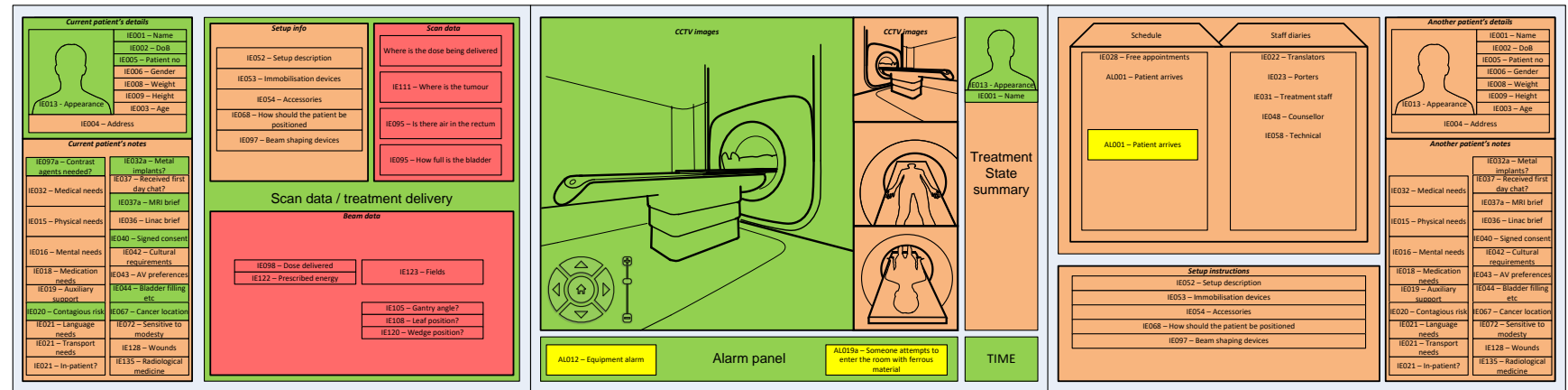
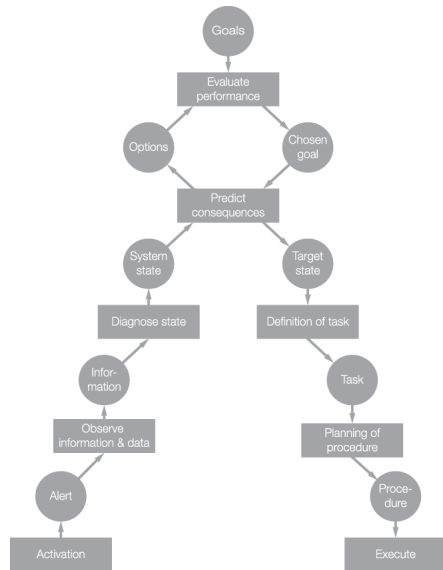
36 information elements could be of use when setting up the patient



- 064 Who is the patient?
- 032 Does the patient have special medical needs?
- 042 Does the patient have any special cultural religious needs?
- 066 Is the patient a child?
- 067 What is the cancer type?
- 068 How should the patient be positioned (posture)?
- 008 What is the weight (size)of the patient?
- 009 What is the height of the patient?
- 015 Does the patient have physical needs?
- 016 Does the patient have mental needs?
- 069 Is the patient comfortable?
- 070 Is the patient relaxed?
- 071 Is the patient cooperative?
- 072 Is the patient sensitive to modesty?
- 052 What are the patients set up instructions?
- 055 What equipment is already out?
- 057 How many staff are available?
- 058 Is technical support available?
- 060 Where is the PSS table?
- 073 What are the PSS table limits?
- 061 Where is the hexapod?
- 074 What are the hexapod limits?
- 062 Where is the gantry?
- 063 Which imaging panels are deployed?
- 065 Where is the patient in relation to the PSS?
- 075 What auxiliary equipment is in the room?
- 053 Does the patient have personalised immobilisation devices?
- 054 Does the patient have personalised accessories?
- 076 What immobilisation aids are required?
- 077 What immobilisation aids are in place?
- 078 Which set up aids are required?
- 079 Which set up aids are in place?
- 080 Which head applicator is required?
- 081 Which head applicator is in place?
- 082 What is the equipment's movement path?
- 051 Are the room and equipment clean?


Design

Control room information



Green – Typically required at the current stage
 Amber – Could be required at the current stage (may be hidden)
 Red – Not required at the current stage
 Yellow – Alerts to be displayed as required

Patient 11:43am



Mr Andrew Greenwood
Date of Birth: 24/09/1965
Treatment: Brain
ID number: JF 02 73 08 A

Treatment 21 of 36

Patient requires follow up appointment with Oncologist after this treatment

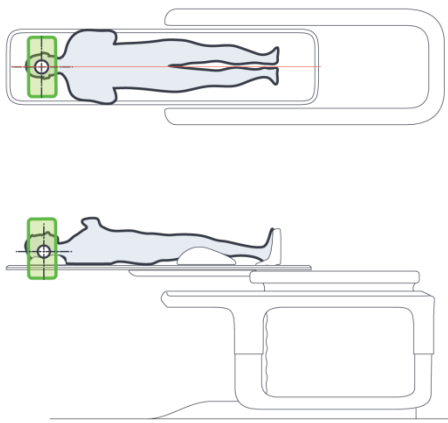
Ambience

Radio 4
Ocean blue ambience

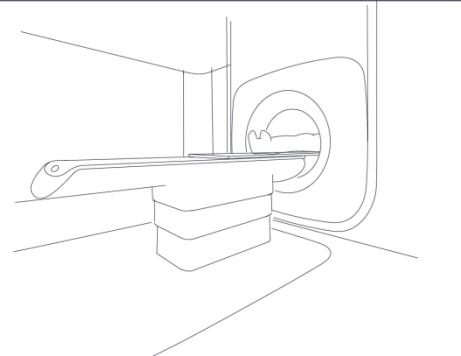
Authorisation

Treatment authorised
Validated by Oncologist
Patient consent formed signed
Patient received MRI brief

Patient setup



CCTV




Bore image 1

Bore image 2

Equipment status

Progress



Mr Andrew Greenwood
Date of Birth: 24/09/1965
Treatment: Brain
ID number: JF 02 73 08 A

Machine prep

Load

Setup

Scan

Optimise

Beam on

Unload

Schedule - Patients 7th June 2012 11:43am

June 2012						
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	1

Patients
HCPs
Physiats
Doctors
Porters
Maintenance

9:00	S. Ying
9:40	O. Trolley
10:20	A. Baker
11:00	J. Cross
11:40	A. Greenwood
12:20	S. Smith
13:30	P. Flannel
14:10	S. Wood
14:50	C. Jones
15:30	T. Head
16:10	K. Street
16:50	J. Kirk

Mr Paul Flannel
Date of Birth: 19/07/1954
Treatment: Abdomen
ID number: JR 05 52 06 C

Ambience

Personal iPod

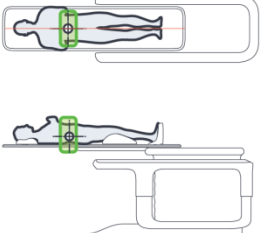
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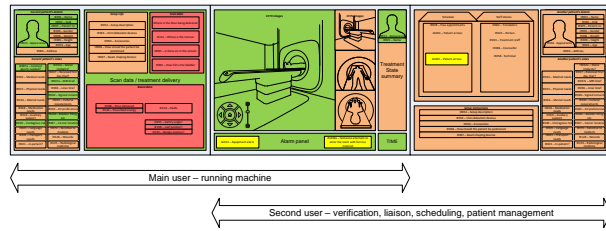
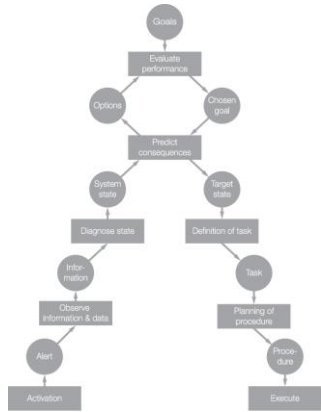
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Treatment 18 of 36

Patient requires a wheelchair to get to the treatment room







The vision





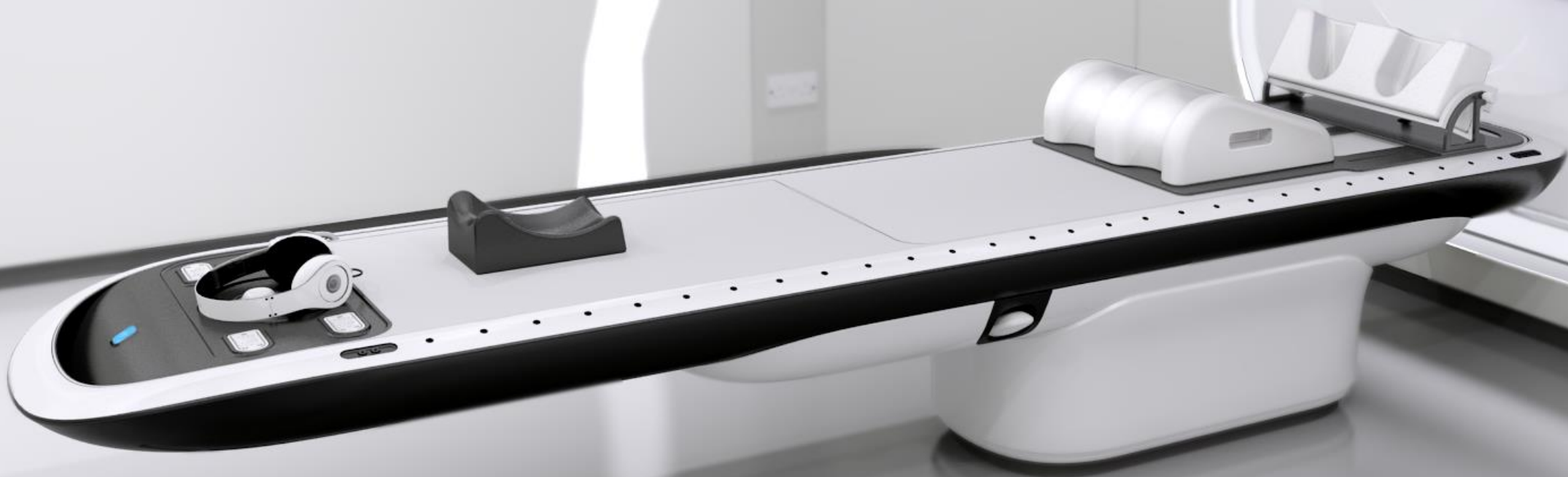






DCA

Elekta



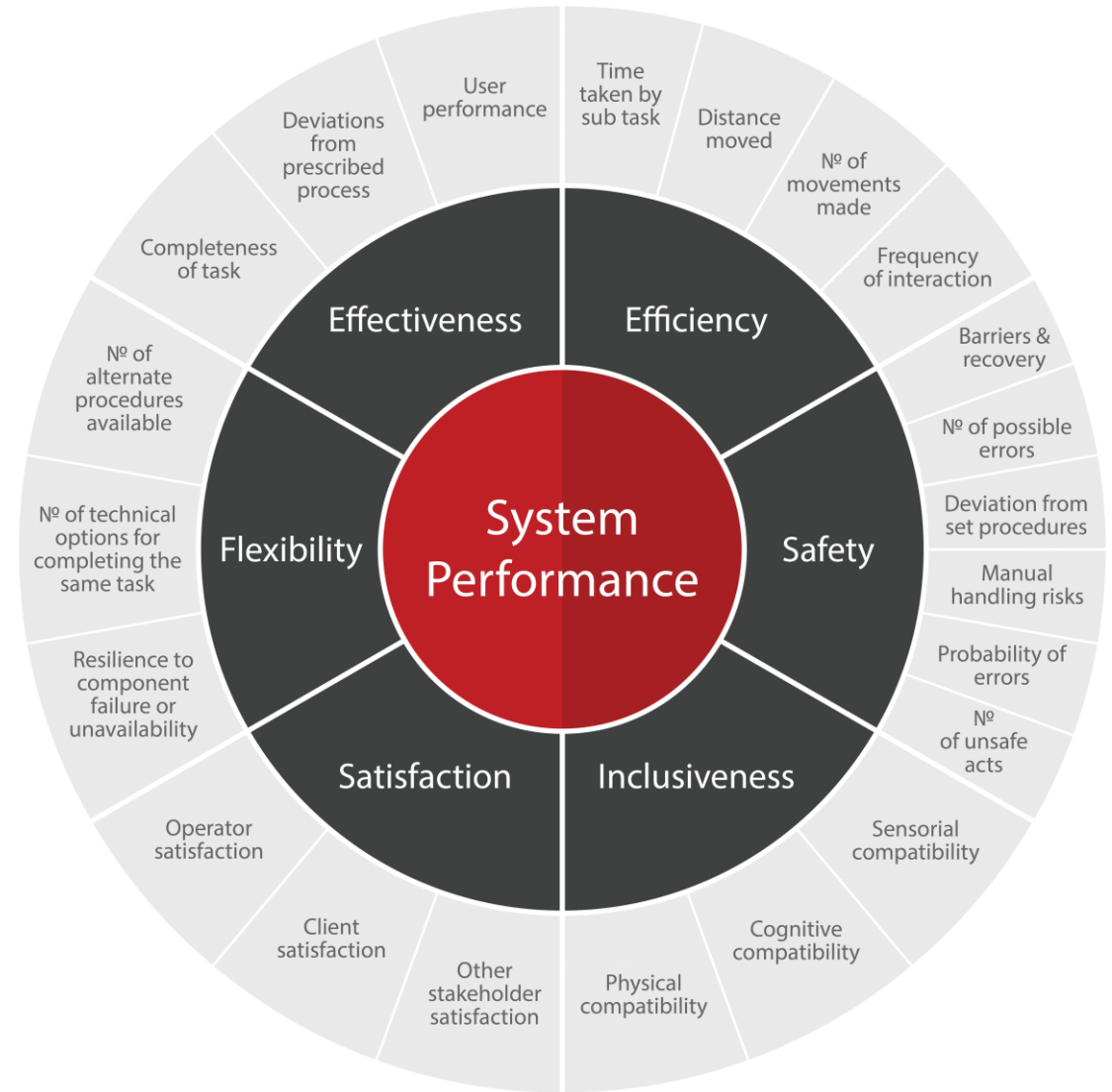
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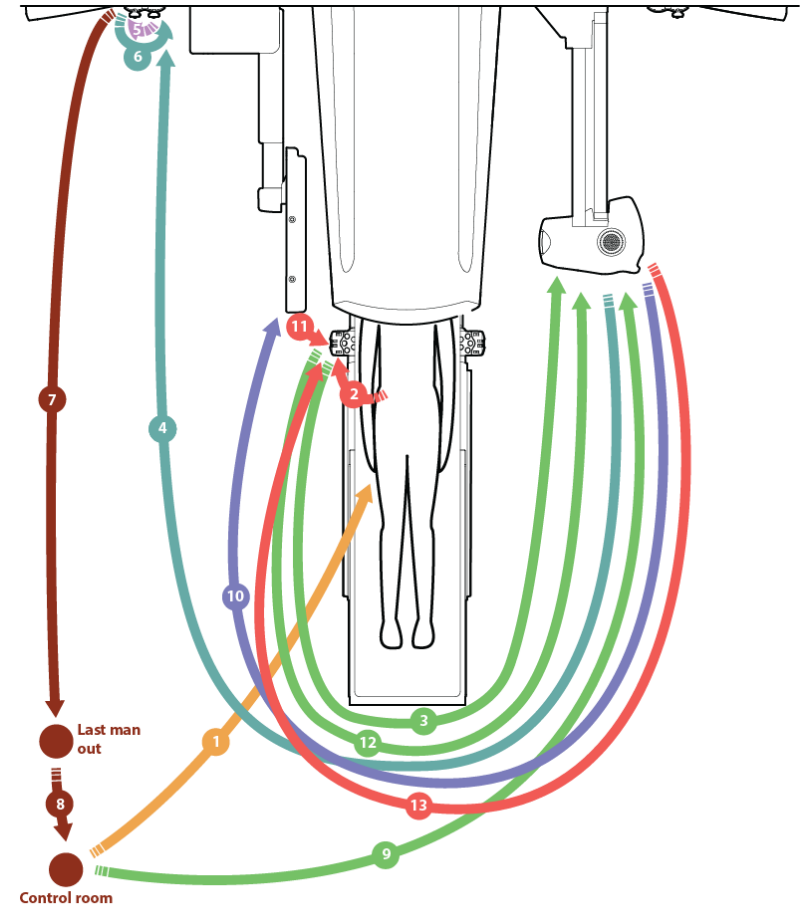
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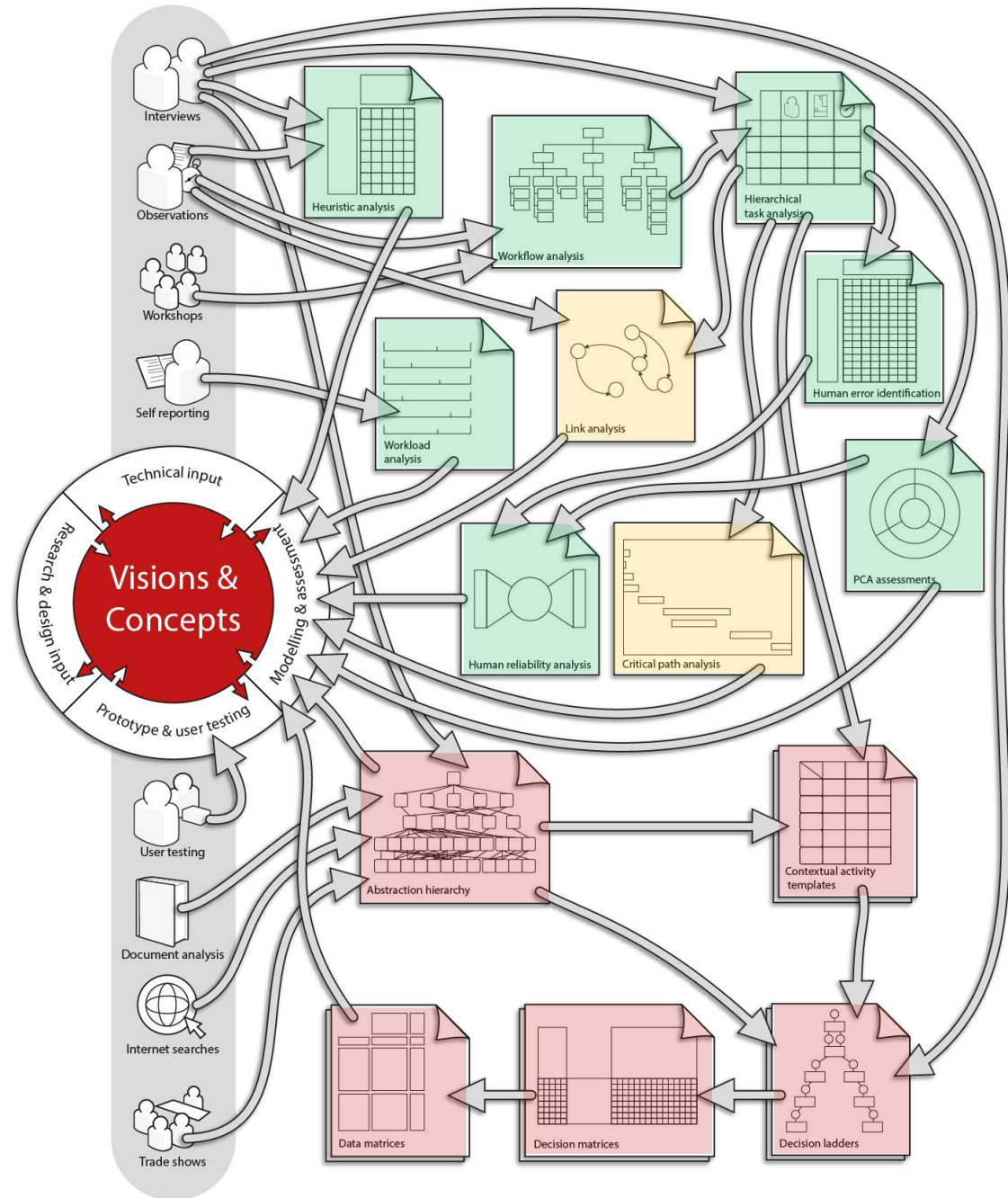
(tools, methods, processes)

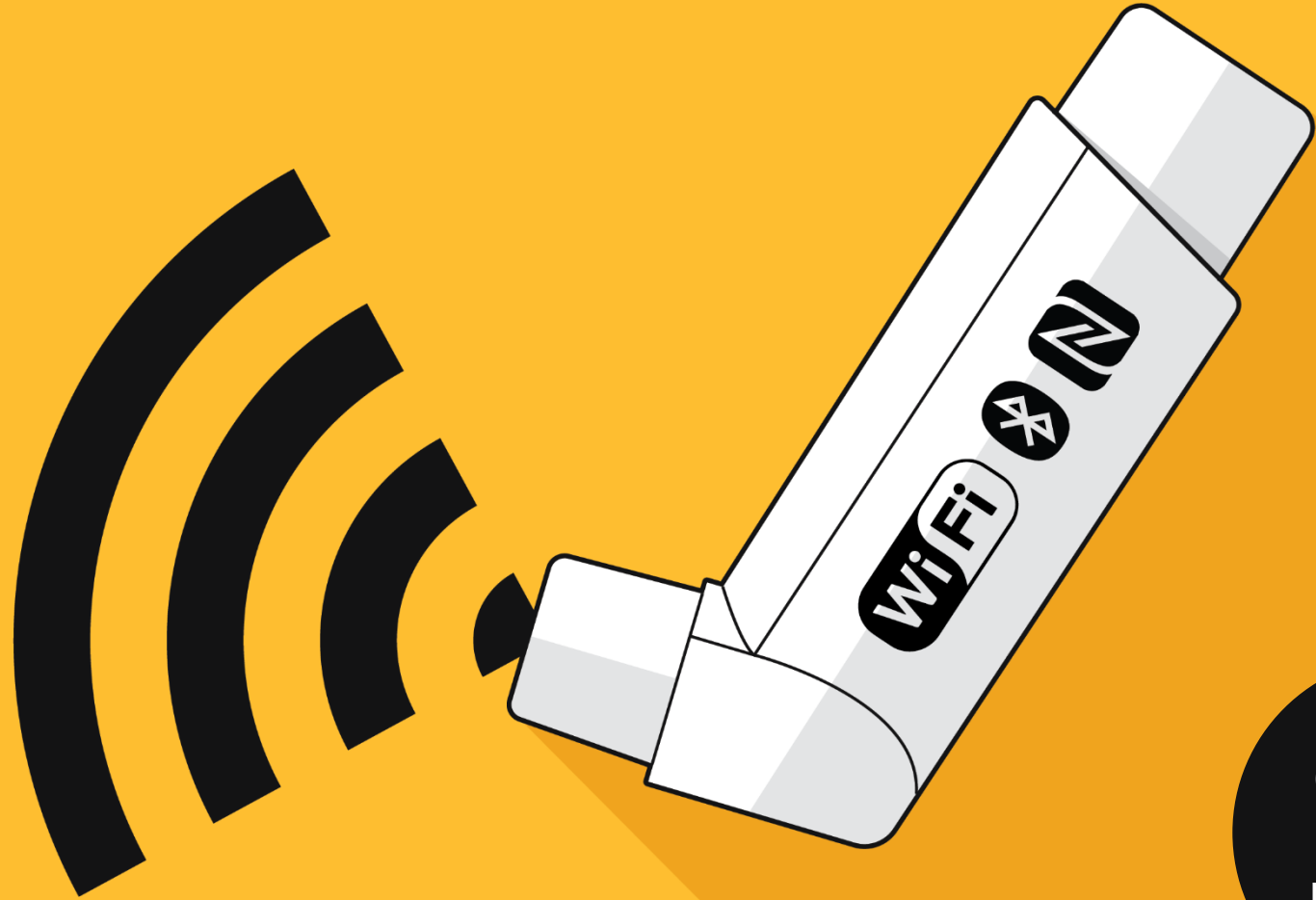
Evolution

Revolution

DCA

- Common tools
- Additional tools
- Systems based tools





Outcome based payments

DCA



danielpjenkins