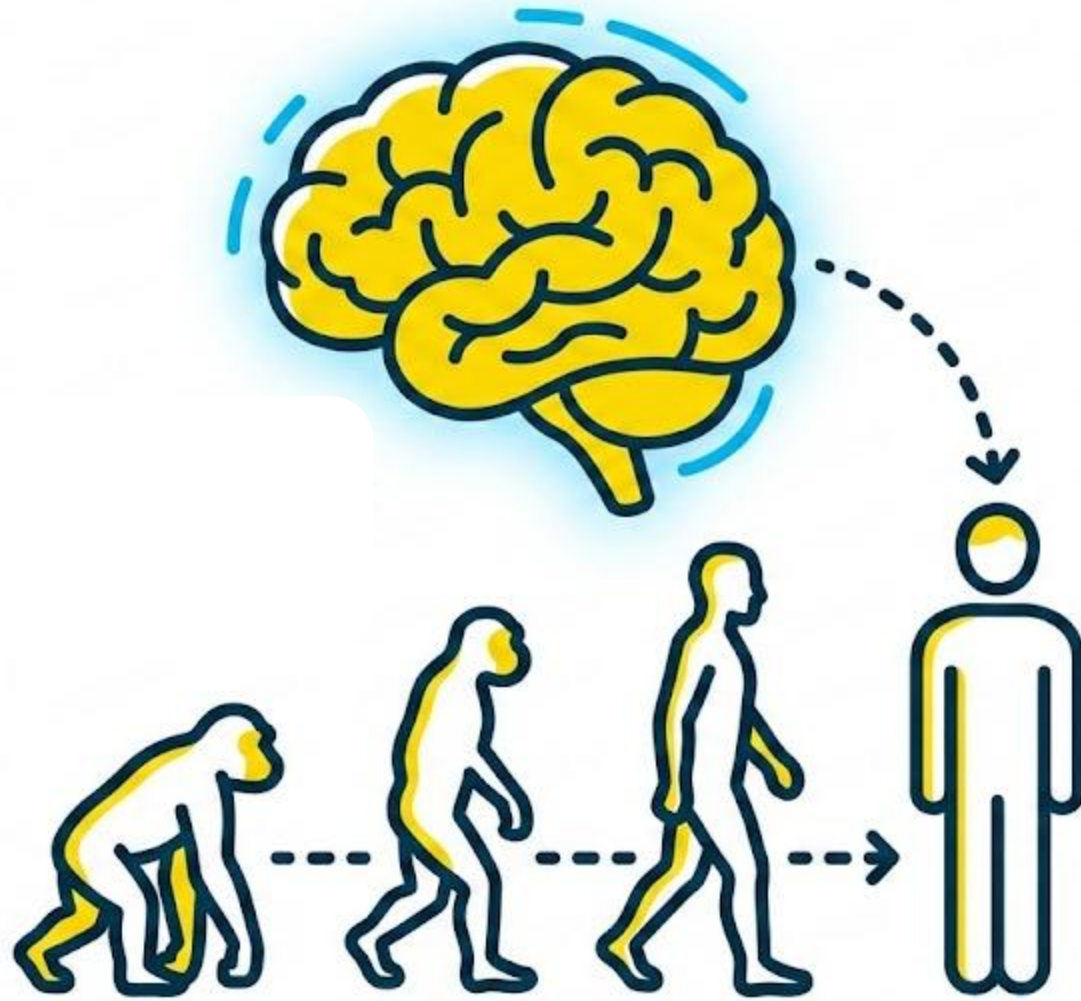


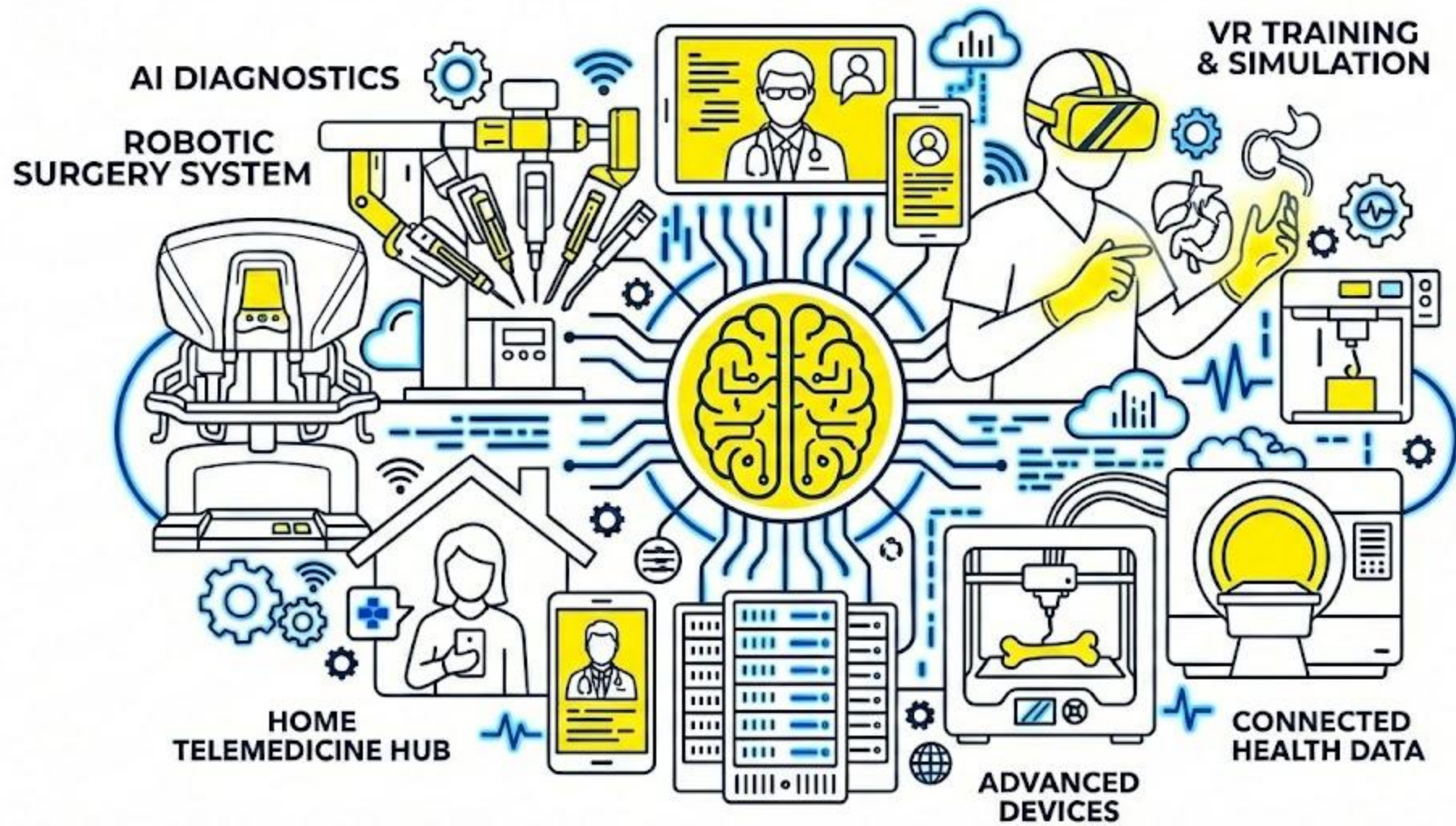


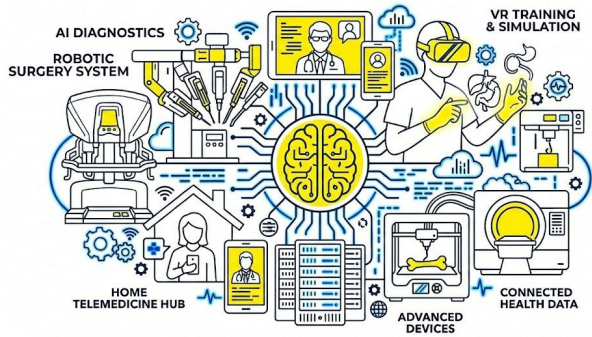
The Innovation Paradox

When Technological Progress Outpaces Human Capability

Galit Kipervaser Levit, Human Factors Engineering Lead ED&U By Aman







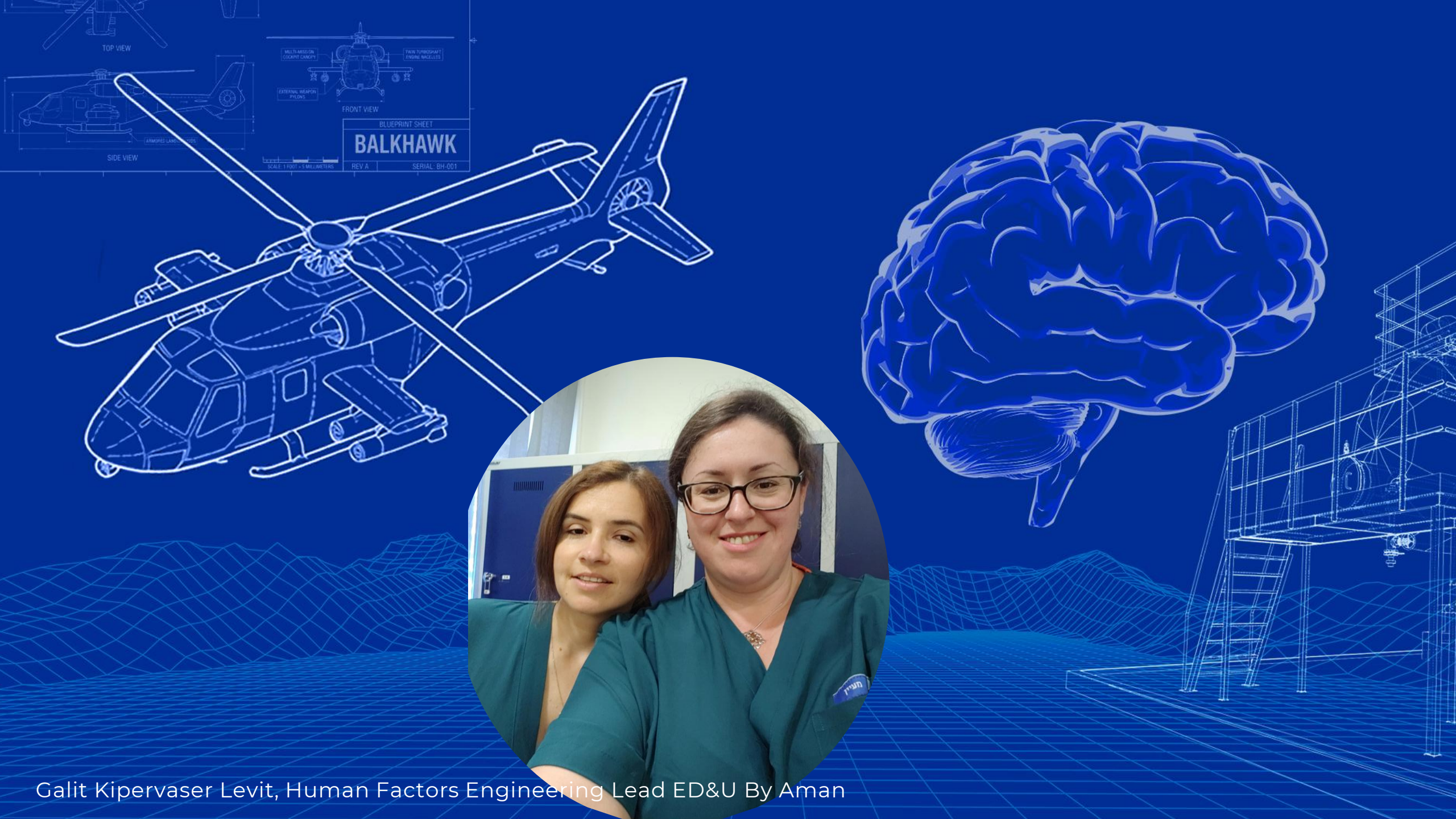
**Complexity
and
processing
capabilities**

**Technology
IoT, AI, big data...**

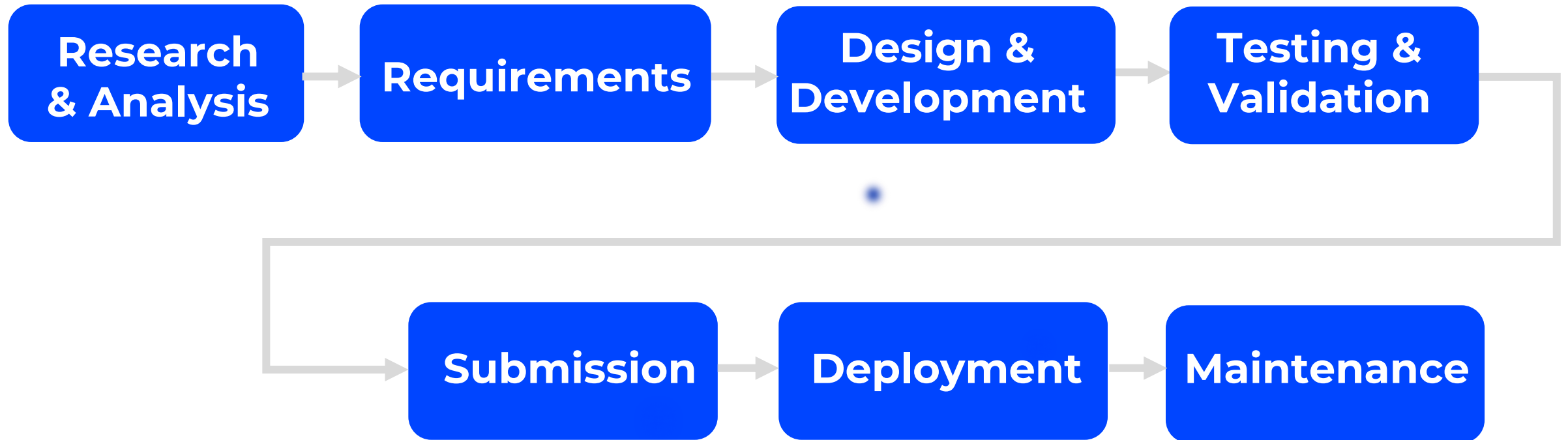
**The
Innovation
Gap**

Human cognition

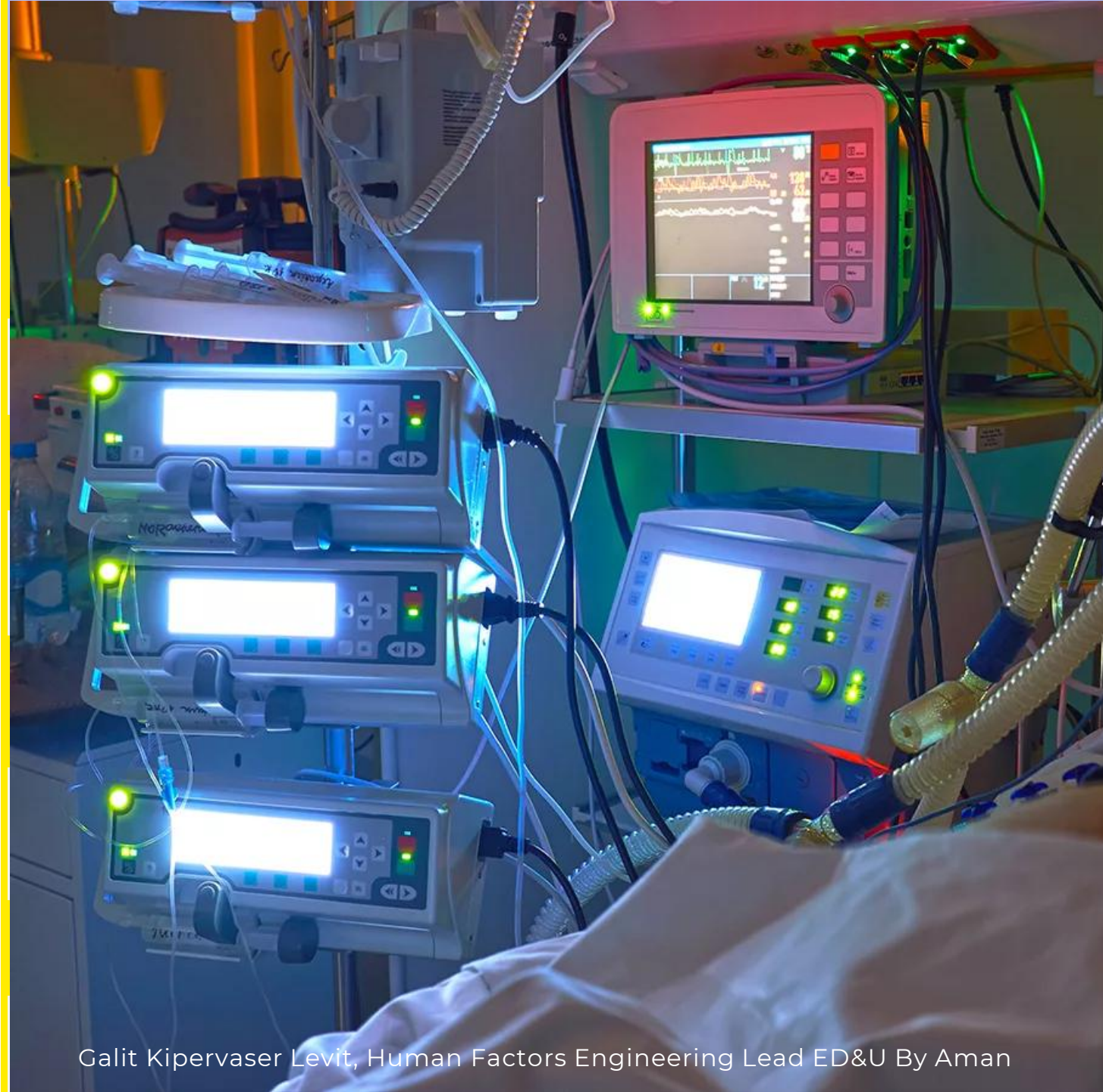
Time



Galit Kipervaser Levit, Human Factors Engineering Lead ED&U By Aman



#1 THE DATA OVERLOAD PARADOX



#1 THE DATA OVERLOAD PARADOX

Device / parameter type	Typical waveform sampling rate [samples/sec]
ICU multiparameter monitor – ECG	240–500 Hz
ICU monitor – SpO ₂ , PPO ₂	30–100 Hz
ICU II	
ICU c wave	
Mecha (pressure/flow)	30–100 Hz
Ventilator calculated parameters	1 Hz (1 sample /sec)
12-lead ECG machine	125–500 Hz
ICP monitor (waveform)	25–100 Hz

**~500-1600
Data points per
second**

The Risk

Alarm Fatigue

Up to 400 Alerts per shift

85-99% False Alarm or not
require clinical intervention

2009-2012 80/98 alert related
deaths

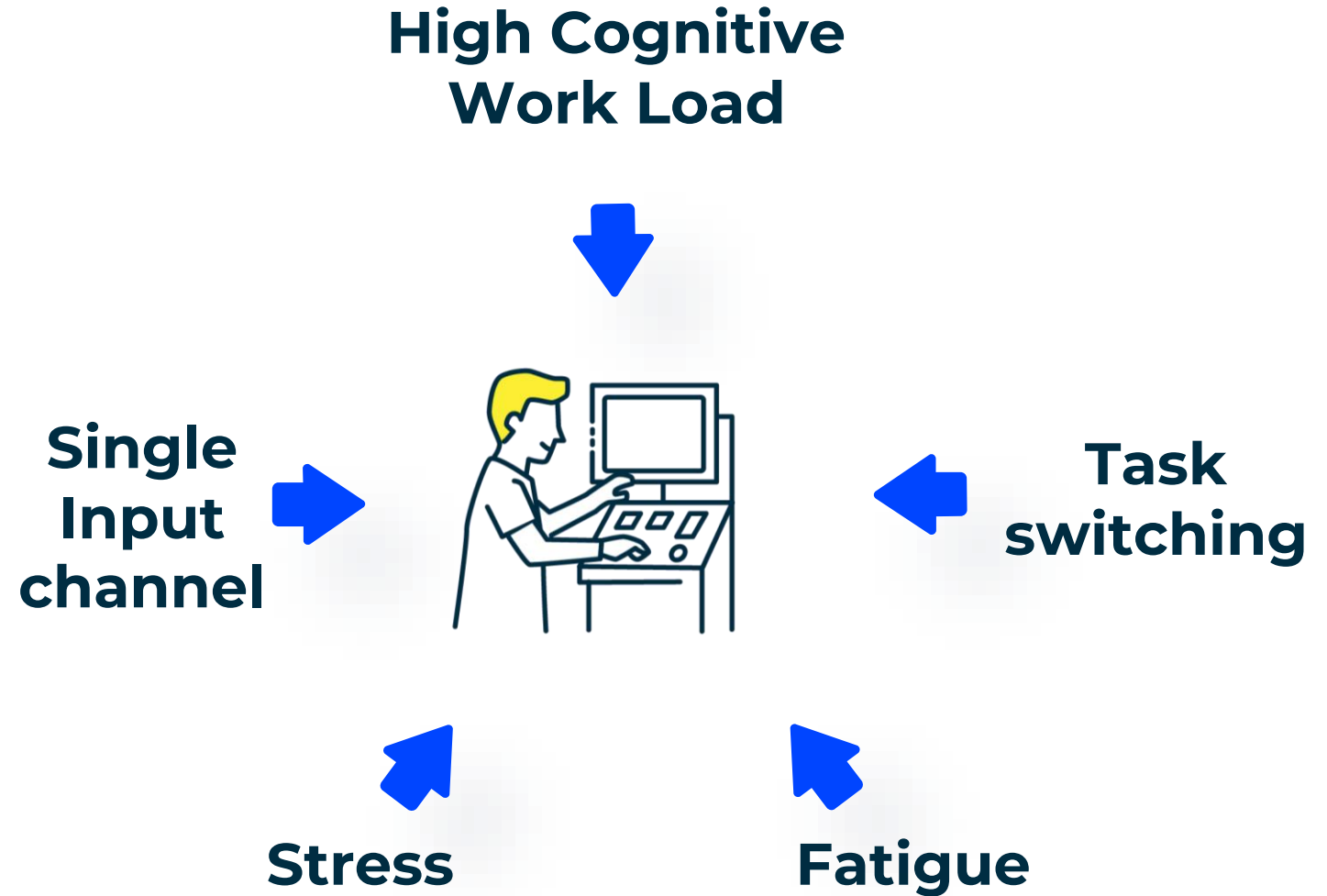


**Delayed
Treatment**

Missed Alert

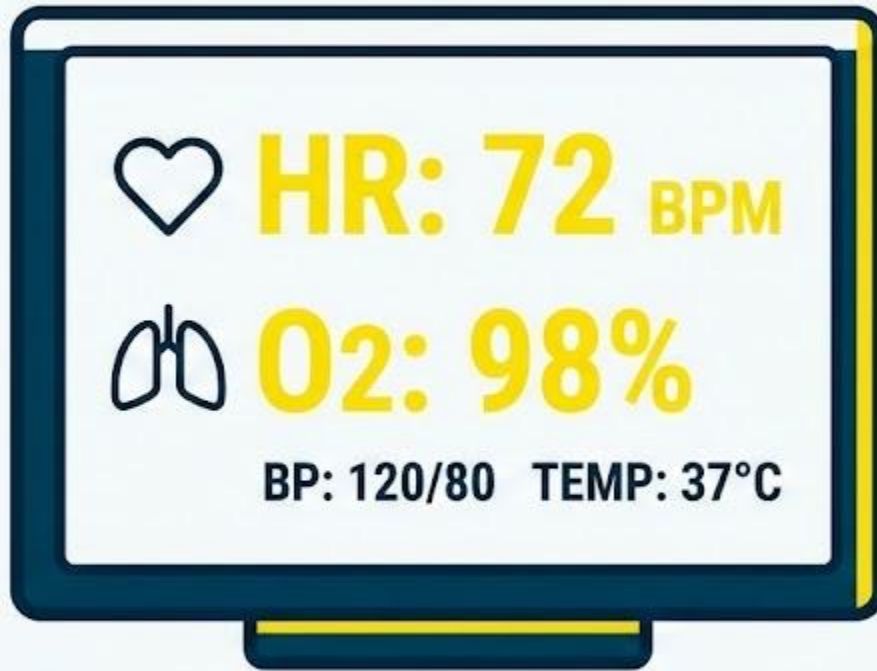
Patient Harm

The Human in the loop



The Design Principles

**DESIGN PRINCIPLE:
AESTHETIC & MINIMALISTIC**



HIERARCHY: VITAL SIGNS FIRST



FILTERING: REDUCE CLUTTER

The Design Principles

**DESIGN PRINCIPLE:
VISIBILITY OF SYSTEM STATUS**



VISUAL ALERT: PROMINENT WARNING

**MULTIMODAL
FEEDBACK**



**AUDITORY ALARM:
CLEAR SOUND.**

The Desing Principles

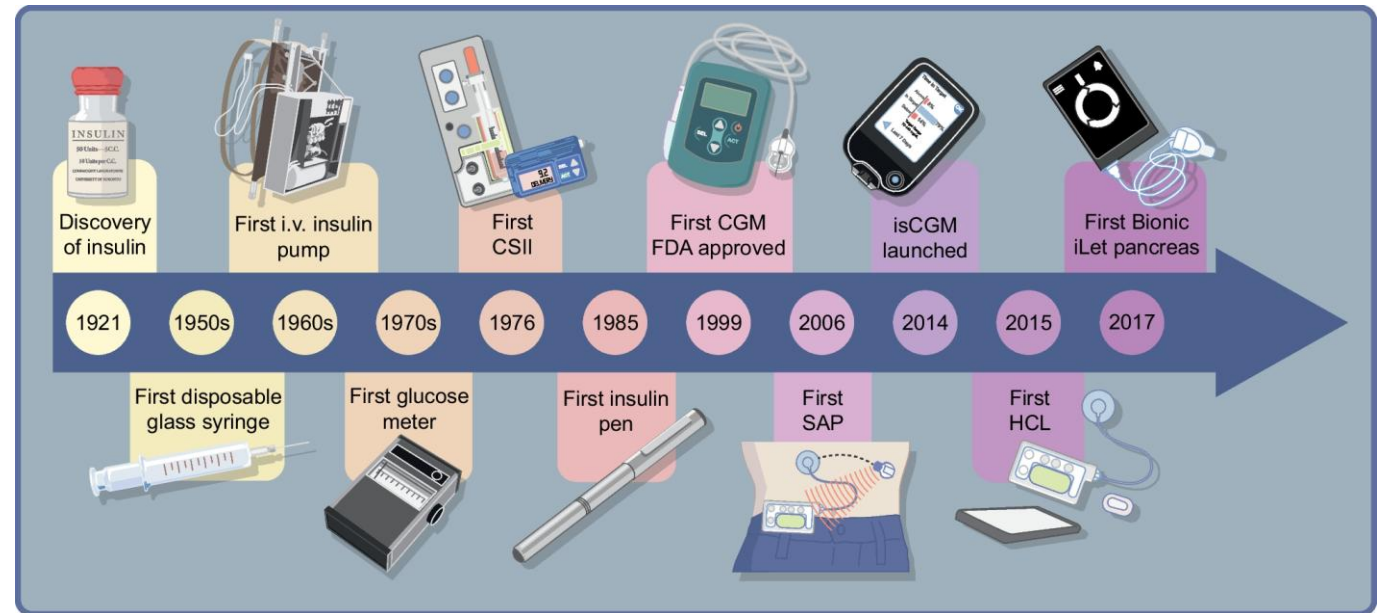
**DESIGN PRINCIPLE:
MINIMIZING INFORMATION ACCESS COST**

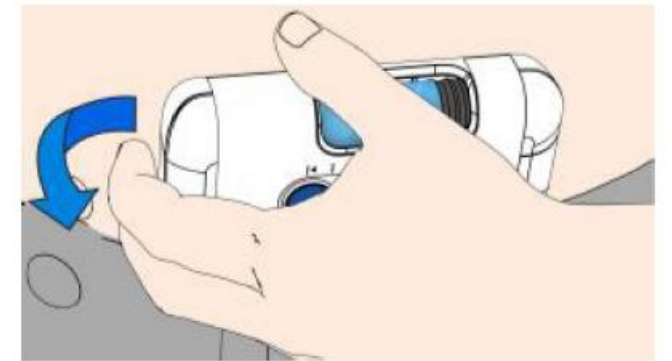
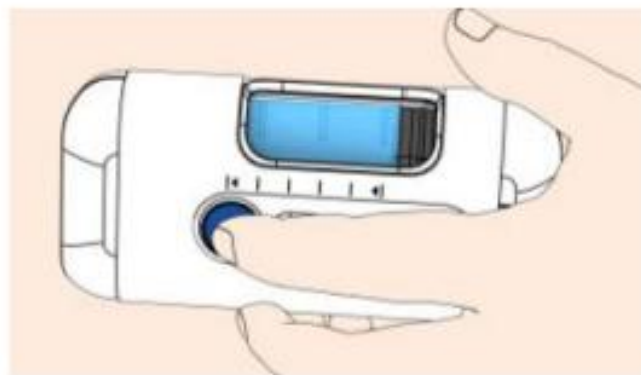
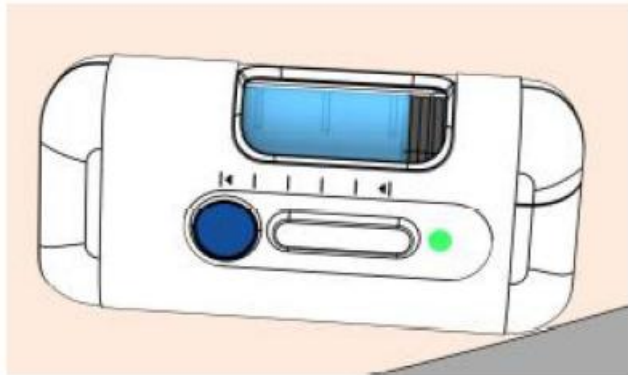
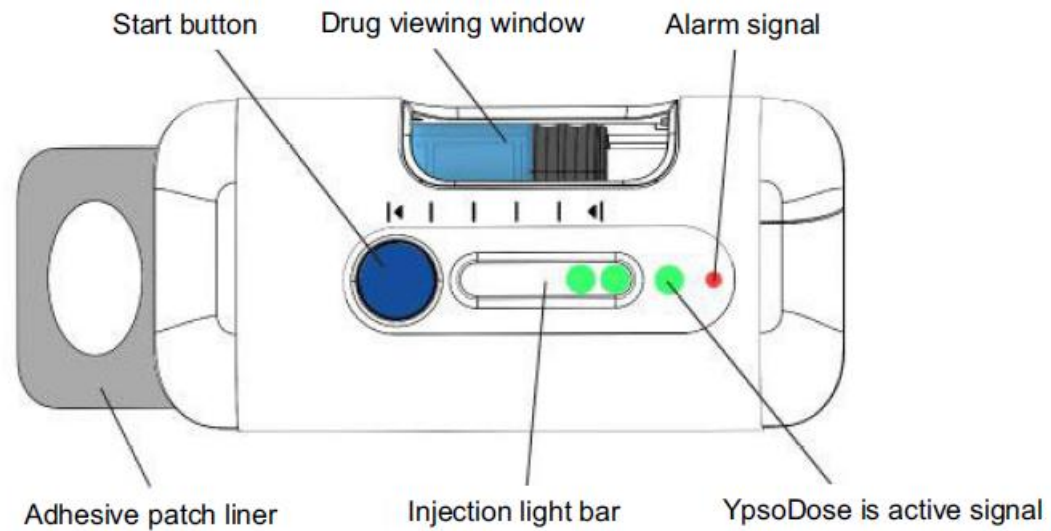


EASY ACCESS: KEY TRENDS

**REDUCED NOISE:
FILTERED DETAILS**

#2 THE MINIATURIZATION MYTH





Formative Study on the Wearability and Usability of a Large-Volume Patch Injector

Jakob Lange¹ Andreas Schneider¹ Christoph Jordi¹ Michael Lau² Timothy Disher²

Galit Kipervaser Levit

Device Requirement

Human Reality

30–50 N thumb force to inject

Grip strength declines 20–30% after 65

0.5-unit precision dial

Arthritis common in 65+
Pain and limited dexterity

Small dose window

Visual Impairment
Dose misreading

Multi-step sequence
Prime → Dial → Inject → Hold

Tremor & reduced fine motor control
Increases dialing/injection errors

The Risk

Dosing Errors

**Skipped
Dosing**

**Non-
adherence**



Mistreatment

The Design Principles That works



Force reduction

 Lower thumb force for arthritic users.

Feedback

Audible/tactile clicks per unit to confirm dose.

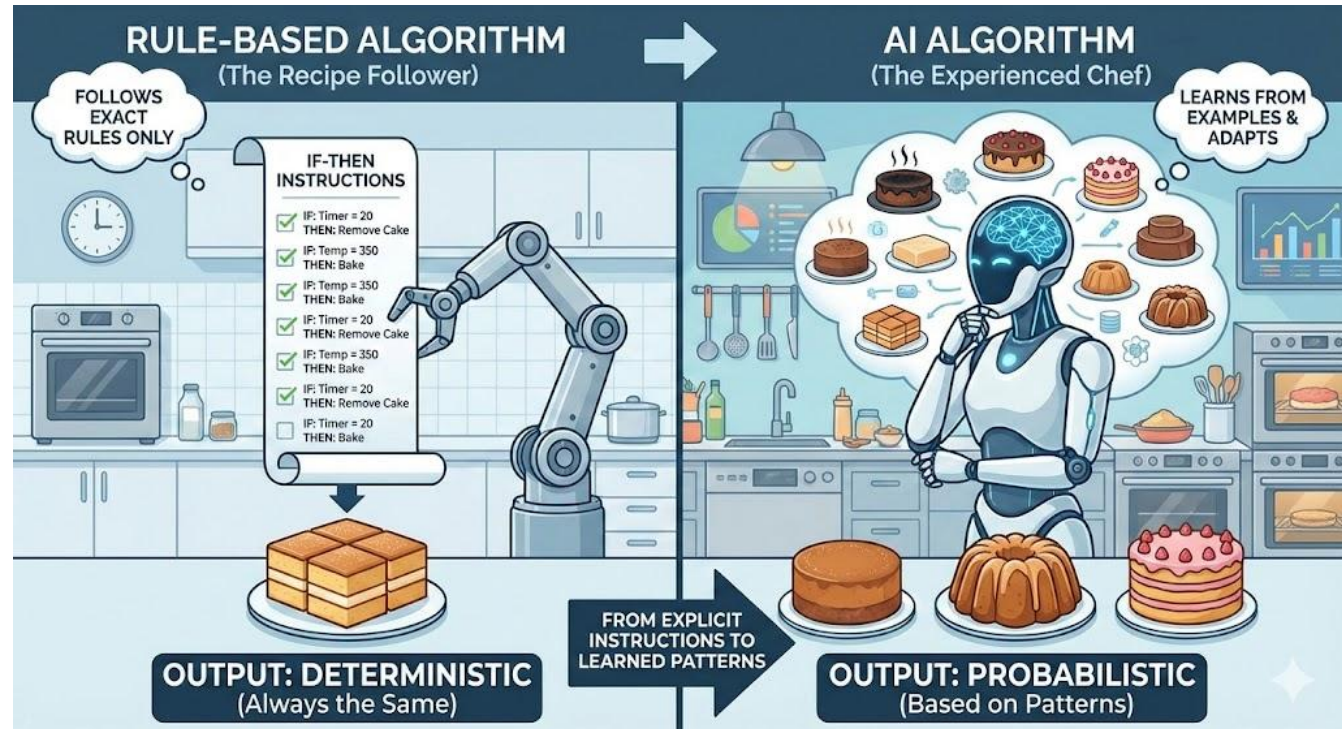
Ergonomic grips

Larger, non-slip surfaces for reduced strain.

High-contrast display

Large, legible dose window to reduce reading errors.

#3 THE INTELLIGENCE ILLUSION



DermaSensor

Monitor
#234-1234

Investigate Further
#234-1234
7



YOUR HEALTH

A.I. POWERED DEVICE TO DETECT SKIN CANCER

PHL17.com

5:20
30°

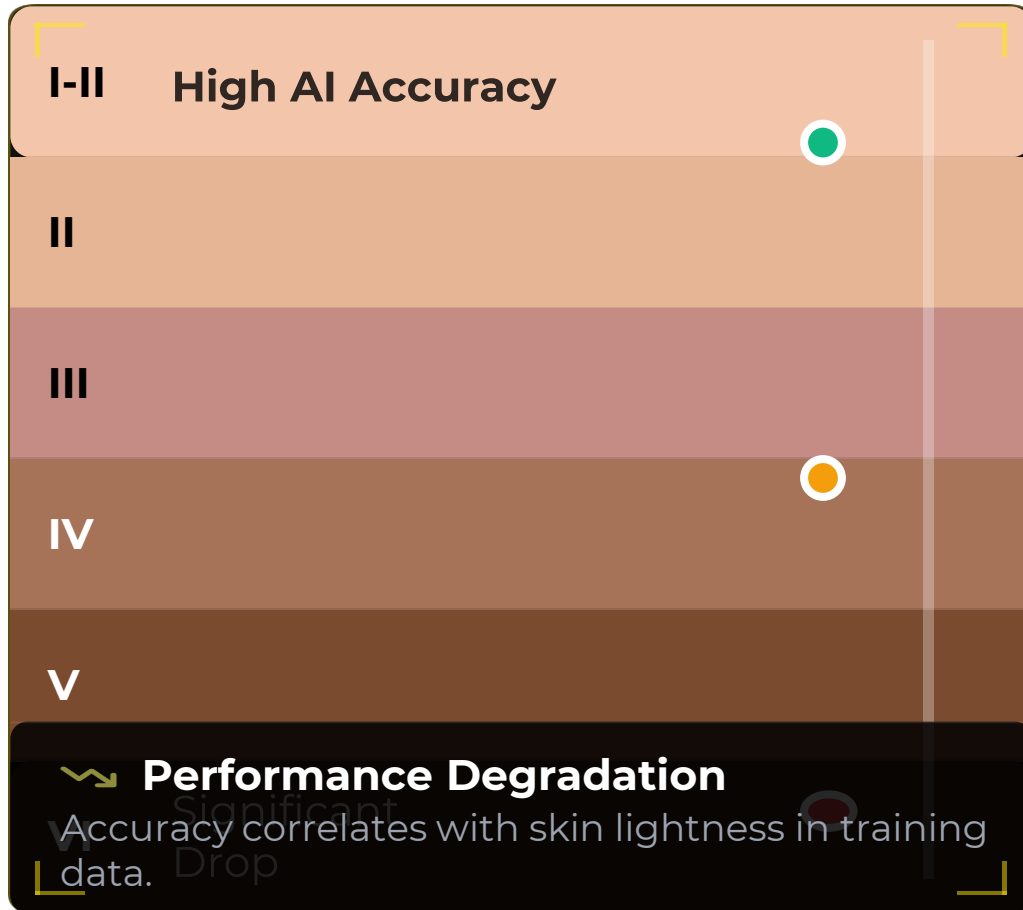


HEADLINES

APPEALS COURT BLOCKS TEXAS LAW TO BAN, RESTRICT LIBRARY BOOKS

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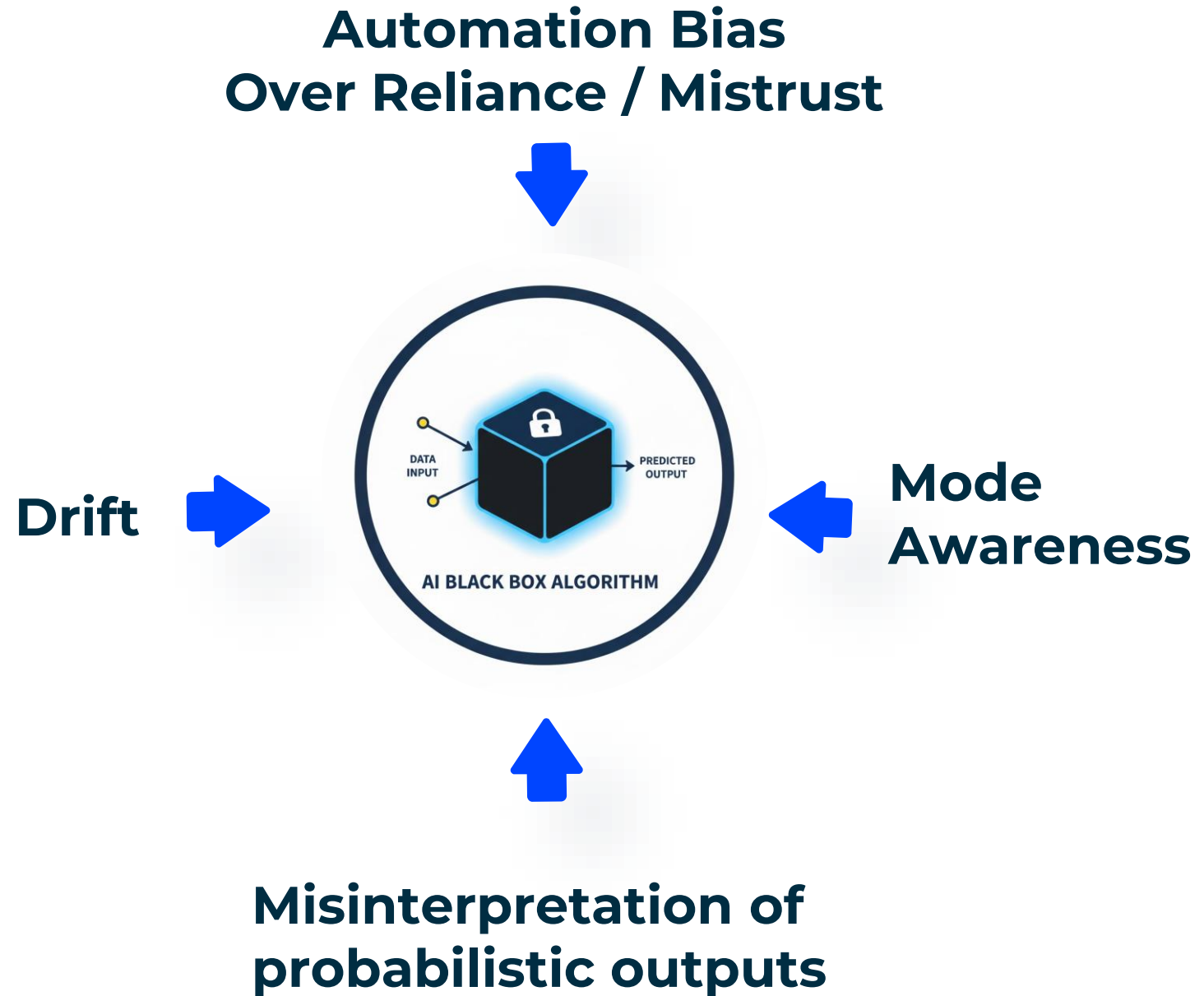
The Data Bias



Diverse Dermatology Images

~30% Reduced accuracy for dark skin

Human In the Loop



The Design Principles

VISIBILITY OF SYSTEM STATUS

ANALYZING...



RESULT & CONFIDENCE



MODEL LIMITATIONS

LIMITATIONS: Not for definitive diagnosis.
Consult a doctor.
Accuracy reduced in low light.

A yellow warning triangle with an exclamation mark is positioned above the text box. Below the text box is a line-art icon of a doctor with a stethoscope.

The Design Principles

RECOGNIZE, DIAGNOSE & RECOVER FROM ERRORS

LOW CONFIDENCE FLAG



DIAGNOSING THE ISSUE



RECOVERY & ACTION

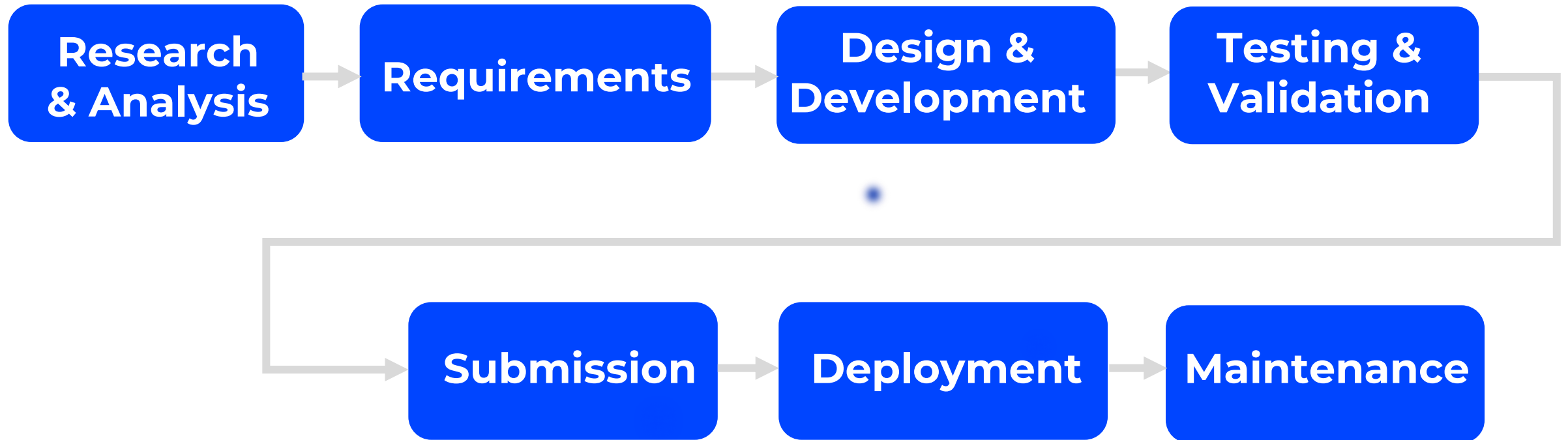


Recommended Action:
Seek professional medical advice for a manual check.

The Desina Principles

USER CONTROL & FREEDOM: EASY OVERRIDE PATHS





**THE
MINIATURIZATION
MYTH**



**THE DATA
OVERLOAD
PARADOX**

**THE
INTELLIGENCE
ILLUSION**

Visit us at booth 11



Galit Kipervaser Levit

