



CASE STUDIES

www.indesignlabs.in

ENGINEERING-LED PRODUCT DESIGN

We combine industrial design with detailed mechanical engineering to move physical products from concept through tooling and production.

01 / WHO WE ARE

Founded in **2011**, InDesignLabs is a founder-led industrial and mechanical product-design consultancy. Led by an **IIT Delhi-trained mechanical engineer** with more than two decades of experience, we help startups and established companies develop robust physical products.

02 / WHAT WE DO

Product architecture
Industrial design
Mechanism design
Electromechanical packaging
Plastic and metal enclosures
DFM / DFA and tolerance control
Prototyping and production engineering

03 / WHY US

Attractive CAD is not enough. We resolve **fitment, motion, tolerances, assembly, tooling and manufacturing risk** early - before they become expensive late-stage failures. Clients get one accountable engineering partner from concept through production.

2011

FOUNDED

20+

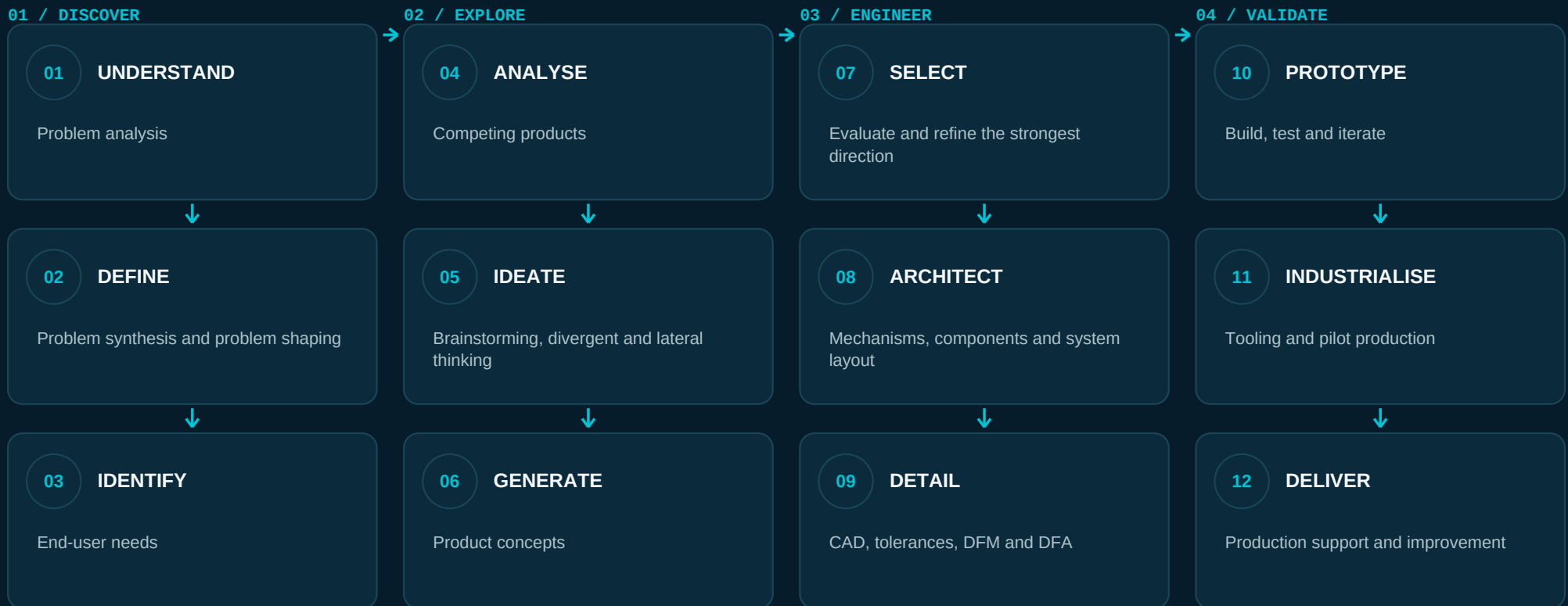
YEARS OF EXPERIENCE

END-TO-END

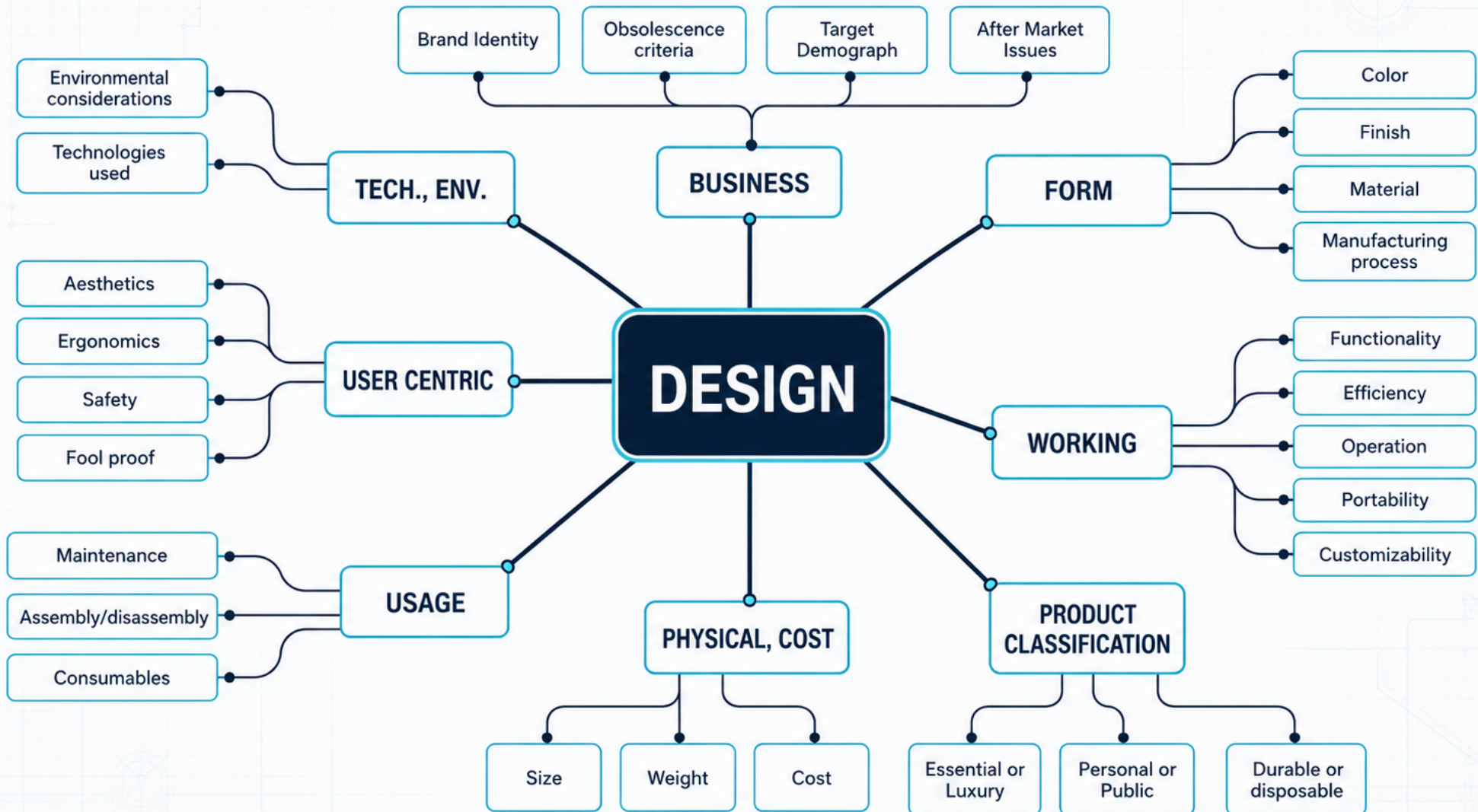
CONCEPT TO PRODUCTION

FROM PROBLEM TO PRODUCTION

A complete, risk-driven path from understanding the need to supporting manufacture.



DESIGN MIND MAP



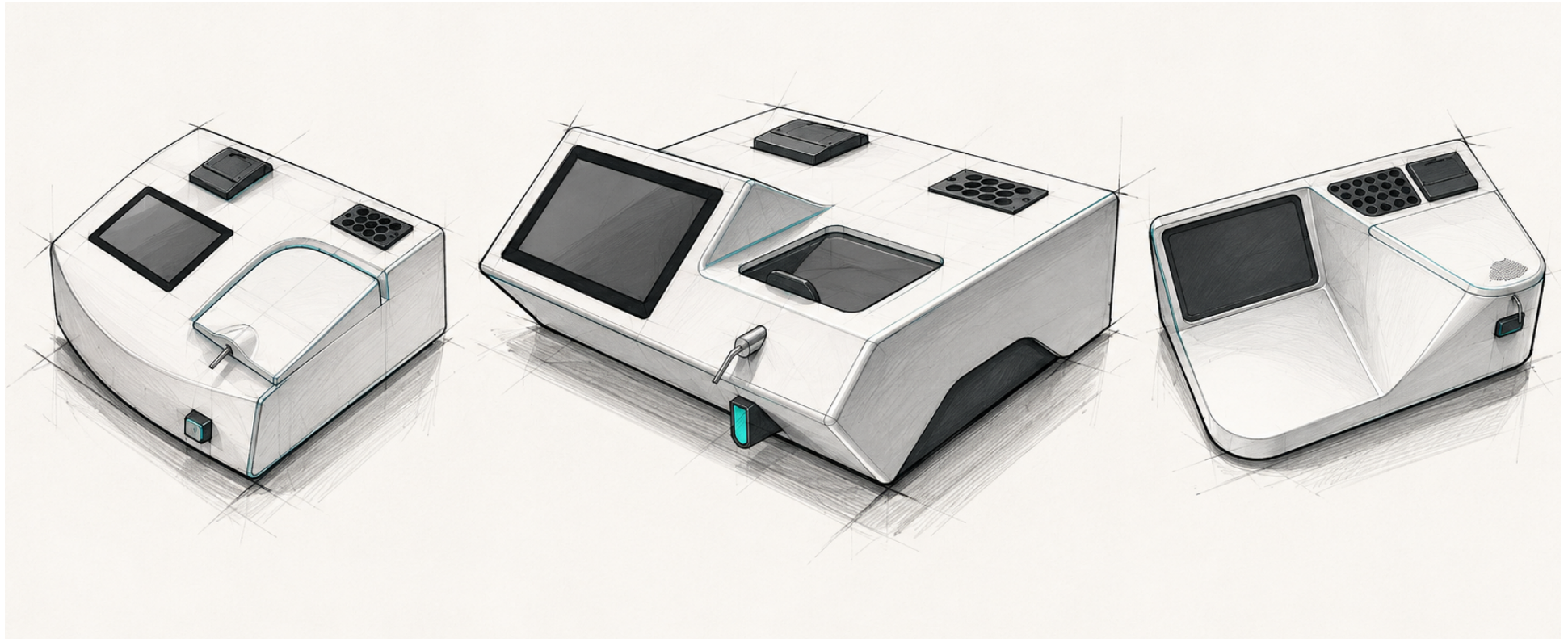
BIOCHEMISTRY ANALYSER

An injection-moulded enclosure engineered around internal components and electronics - with tooling simplicity built into the form.



THREE DIRECTIONS. ONE SELECTED.

Alternative enclosure architectures developed around the same core functional requirements.



CONCEPT 01

CONCEPT 02 / SELECTED

CONCEPT 03

Three form languages were compared before Concept 02 advanced into detailed enclosure engineering and internal integration.

SKETCH VISUALISATION RECONSTRUCTED FROM THE 2022 3D MODELS

DESIGNING FOR FUNCTION AND TOOLING SIMPLICITY

THE BRIEF

Curionics required an enclosure that packaged the analyser's internal components and electronics within a clean, ergonomic product. The brief called for three aesthetic concepts and a simple form strategy for cost-conscious injection moulding.

DESIGN RESPONSE

01 CONCEPT EXPLORATION

Three directions tested different proportions, layouts and interface treatments.

02 INTERNAL INTEGRATION

The enclosure was modelled around internal components and electronics.

03 TOOLING SIMPLIFICATION

Geometry was simplified to reduce undercuts, mould complexity and tooling cost.

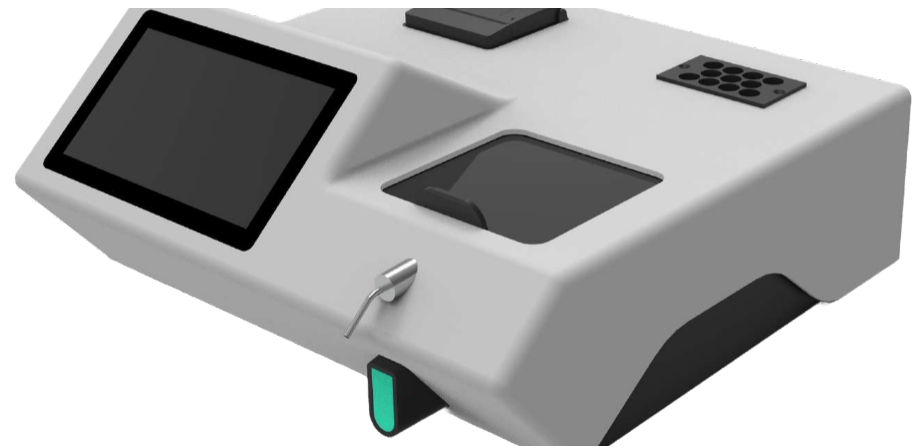
04 ENCLOSURE ENGINEERING

The selected direction was developed in 3D with a 4 mm nominal wall thickness.

INDESIGNLABS CONTRIBUTION

3D enclosure modelling / Internal engineering /
Component and electronics integration / Mould simplification

SELECTED DIRECTION / CONCEPT 02



3

CONCEPT DIRECTIONS

4 mm

NOMINAL WALL

Reduced

UNDERCUTS

OUTCOME

The middle concept was selected as the final direction. Enclosure design and internal integration were completed.

TRUEHB HAEMOGLOBIN-TESTING DEVICE

A compact injection-moulded enclosure combining distinctive form with a positive strip-retention mechanism.



WRIG NANOSYSTEMS

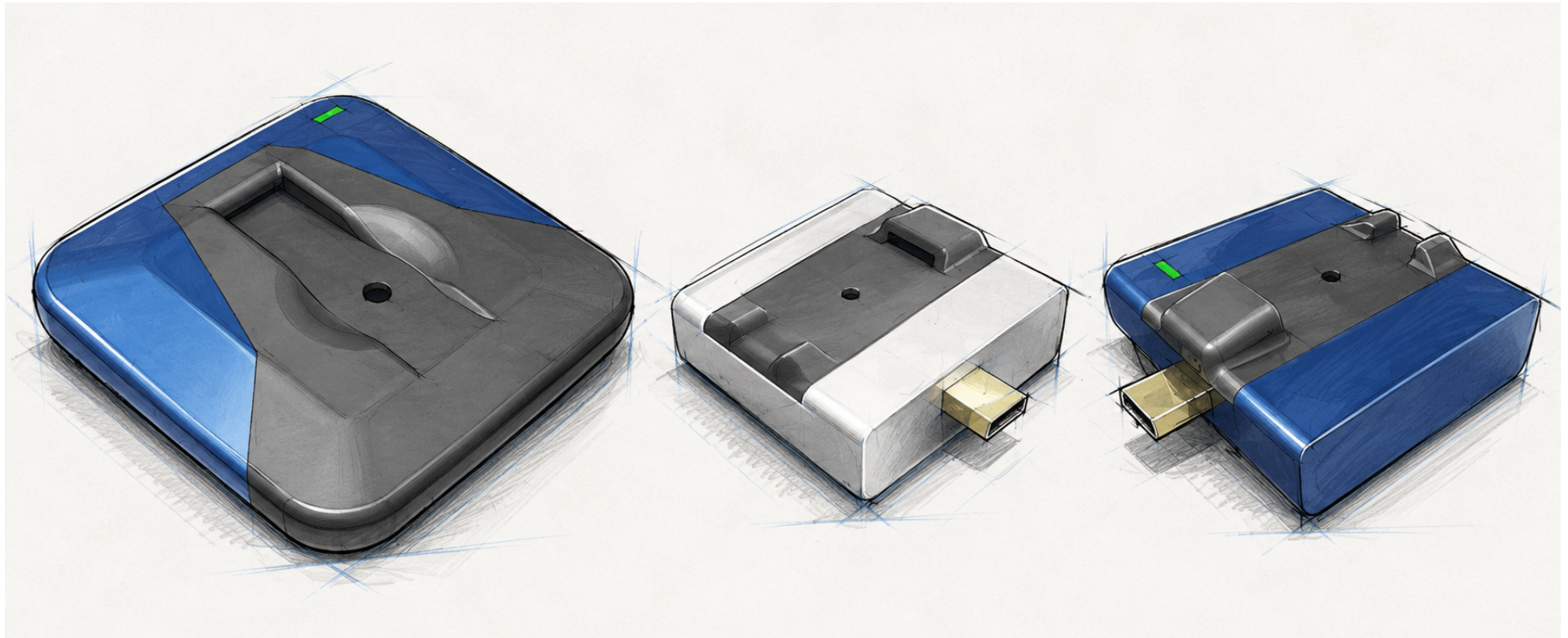
2016

3 CONCEPT DIRECTIONS

CANTILEVER STRIP CLAMP

THREE DIRECTIONS. ONE SELECTED.

Form, interface and strip-retention alternatives explored for a compact diagnostic device.



CONCEPT 01 / SELECTED

CONCEPT 02

CONCEPT 03

Three visual directions were compared before Concept 01 advanced into enclosure engineering and mechanism integration.

SKETCH VISUALISATION RECONSTRUCTED FROM THE 2016 3D MODELS

FORM, FUNCTION AND POSITIVE STRIP RETENTION

THE BRIEF

Wrig Nanosystems required a compact enclosure for internal components and electronics, with ergonomic operation, three aesthetic concepts and simplified injection-mould tooling. The product also needed a distinctive presence and firm blood-strip retention.

DESIGN RESPONSE

01 CONCEPT EXPLORATION

Three directions balanced visual impact, ergonomics and compact packaging.

02 INTERNAL INTEGRATION

The enclosure was modelled around internal components and electronics.

03 TOOLING SIMPLIFICATION

Geometry was simplified to reduce undercuts, mould complexity and tooling cost.

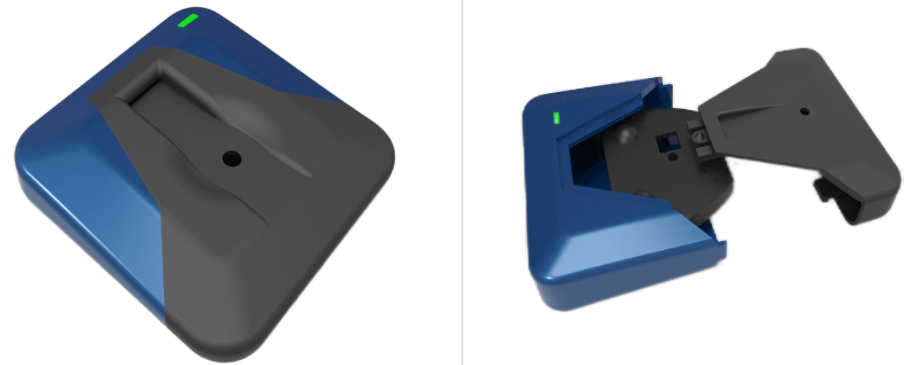
04 STRIP-RETENTION MECHANISM

A cantilever clamping system was engineered to hold the blood-testing strip firmly in place.

INDESIGNLABS CONTRIBUTION

3D enclosure modelling / Internal engineering /
Electronics packaging / Cantilever clamp / Mould simplification

SELECTED DIRECTION + CLAMP DETAIL



3

CONCEPT DIRECTIONS

1.5 mm

NOMINAL WALL

Clamp

STRIP RETENTION

OUTCOME

Concept 01 was selected for development.
The enclosure and cantilever clamp were engineered in 3D.

IoT REMOTE

A compact four-button enclosure engineered from a supplied concept through SLA validation to injection-moulded production.

CLIENT

**Vivo Collaboration
Solutions Limited**

YEAR / SCOPE

2026 / External 3D modelling + internal engineering

INJECTION-MOULDED OUTCOME



CONCEPT TO MOULDED PRODUCT

External design and internal architecture developed for production.

01

INPUT

BASIC CONCEPT

02

ENGINEER

CAD + PACKAGING

03

VALIDATE

SLA PRINT

04

PRODUCE

INJECTION MOULD

ENGINEERED CAD ENCLOSURE



MANUFACTURED OUTCOME



Four clearly separated emergency actions.

Manufacturing path
SLA 3D printing followed by plastic injection moulding.

SIMPLICITY, COMPONENT FIT AND TOOLING CONTROL

THE BRIEF

Vivo Collaboration Solutions Limited supplied a basic concept for a compact IoT remote. The enclosure needed to package the electronics, feel ergonomic, carry a distinctive visual presence and remain simple enough to control injection-mould tooling cost.

DESIGN RESPONSE

01 CONCEPT TRANSLATION

The supplied direction was converted into a coherent, production-focused 3D enclosure.

02 COMPONENT INTEGRATION

Internal architecture was resolved around the electronic components and fitment needs.

03 TOOLING SIMPLIFICATION

Geometry was refined to reduce undercuts, mould complexity and tooling cost.

04 PROTOTYPE TO PRODUCTION

The engineered enclosure progressed through SLA 3D printing and injection moulding.

INDESIGNLABS CONTRIBUTION

External 3D modelling / Internal engineering /
Component fitment / Mould simplification / Production support

CAD DEVELOPMENT + MOULDED OUTCOME



1.5 mm

NOMINAL WALL

SLA

PROTOTYPE STAGE

Moulded

PRODUCTION OUTCOME

OUTCOME

The enclosure was validated by SLA 3D printing and subsequently produced by injection moulding.

EZ-SIT

A collapsible armrest accessory engineered to make sitting down and standing up easier on armless restaurant chairs.

CLIENT

EZ-SIT

YEAR / SCOPE

2012 / Detailed engineering + mechanism design

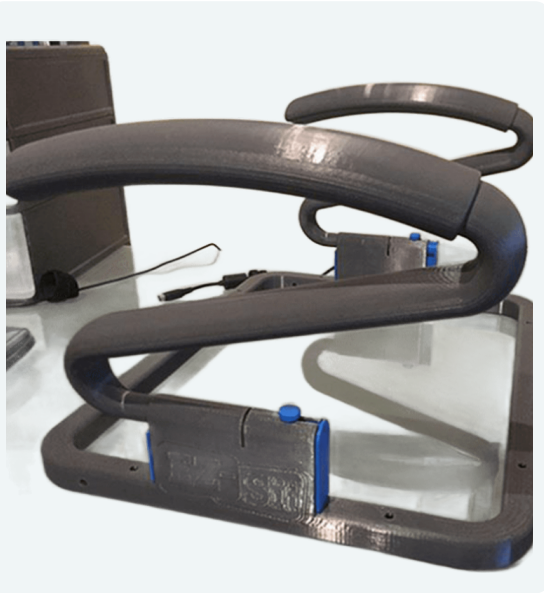
DEPLOYABLE SUPPORT / COMPACT STORAGE



THREE WAYS TO DEPLOY, LOCK AND FOLD

Alternative mechanism architectures explored safe support in use and compact storage on the chair.

MECHANISM 01 / 3D-PRINTED



Physical 3D-printed prototype used to validate one of the three armrest mechanisms.

MECHANISM 02 / CAD DIRECTION



Alternative locking / unlocking architecture shown deployed and folded.

MECHANISM 03 / CAD DIRECTION



Alternative locking / unlocking architecture shown deployed and folded.

THREE DIRECTIONS SHOWN WITHOUT RANKING; A SELECTED MECHANISM WAS NOT IDENTIFIED IN THE PROJECT RECORD.

ENGINEERING SUPPORT THAT FOLDS AWAY

THE BRIEF

Restaurant chairs often lack armrests, making the sit-to-stand movement harder for older users. EZ-Sit needed to add comfortable support to an armless chair, lock securely for use and collapse neatly when the armrests were not required.

DESIGN RESPONSE

01 CHAIR-MOUNTED SUPPORT

An accessory architecture was developed for armless restaurant-chair seating.

02 ERGONOMIC ASSISTANCE

The armrests provide leverage for the sit-to-stand and stand-to-sit movement.

03 MECHANISM EXPLORATION

Three locking / unlocking concepts were engineered for collapsible armrests.

04 PROTOTYPE TO PRODUCTION

The design progressed through 3D-printed prototyping and injection moulding.

INDESIGNLABS CONTRIBUTION

Detailed engineering / Mechanism design /
Three locking-unlocking concepts / Prototype-to-production development

TWO PRODUCT STATES



DEPLOYED



COLLAPSED

3

MECHANISM CONCEPTS

2

ARMREST STATES

Moulded

PRODUCTION PATH

OUTCOME

Three mechanism directions were detailed. The accessory was 3D printed before progressing to injection moulding.

WAMI 7-FUNCTION ICU BED

A motorised SS304 critical-care platform engineered for seven controlled motions, structural stability and dependable operation under load.

CLIENT

WAMI

YEAR / SCOPE

2024 / Detailed engineering + mechanism design + prototyping

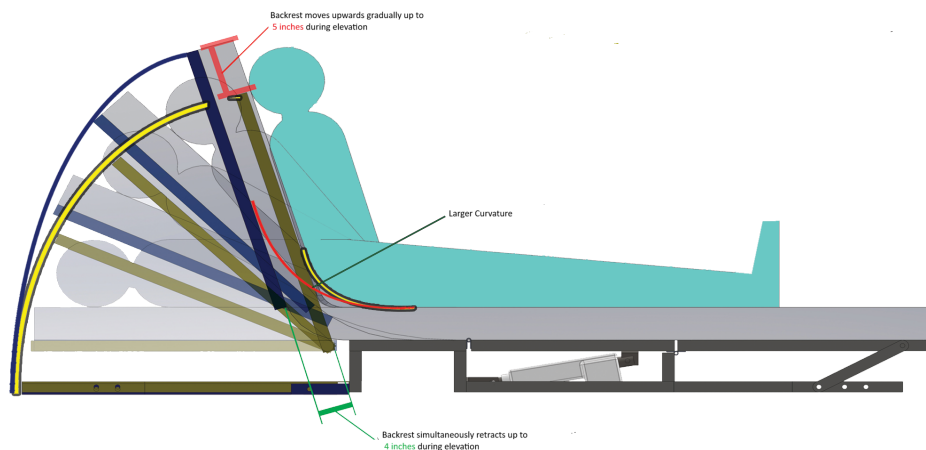
MOTORISED / MULTI-AXIS / SS304



SEVEN MOTIONS. ONE STABLE PLATFORM.

The mechanism stack coordinates patient positioning, bed height and lateral tilt without compromising the load path.

ADVANCED BACKREST KINEMATICS



UP TO 5 IN

UPWARD BACKREST TRAVEL

UP TO 4 IN

REARWARD RETRACTION

01 BACKREST

0-70 degrees

02 LEG REST

0-30 degrees

03 HEIGHT

350-750 mm

04 TRENDLENBURG

0-16 degrees

05 REVERSE TREND.

0-16 degrees

06 LATERAL LEFT

0-16 degrees

07 LATERAL RIGHT

0-16 degrees

The rising-and-retracting backrest creates clearance for hip movement and reduces the forward push associated with conventional fixed-pivot backrests.

MULTI-AXIS MOTION WITHOUT INSTABILITY

THE BRIEF

WAMI required a seven-function ICU bed with backrest and leg-rest elevation, height adjustment, Trendelenburg, reverse Trendelenburg and bilateral lateral tilt. The structure had to use SS304 and remain rigid and stable under patient loading.

DESIGN RESPONSE

01 MECHANISM ARCHITECTURE

Seven powered functions were integrated into a coordinated multi-frame structure.

02 LOW-BACKLASH JOINTS

The 'no play' requirement was translated into controlled clearances, stable pivots and disciplined load transfer.

03 STRUCTURAL ENGINEERING

The SS304 frame and actuator geometry were developed for stiffness across changing bed positions.

04 PROTOTYPE VALIDATION

The engineered system was prototyped, refined and progressed into a market-ready product.

INDESIGNLABS CONTRIBUTION

Detailed engineering / Mechanism design /
Structural integration / Prototyping and refinement

PRODUCTION PRODUCT



7

POWERED FUNCTIONS

SS304

FRAME MATERIAL

8000 N

ACTUATOR RATING

OUTCOME

The prototype was engineered into a production ICU bed.
The product is currently in the market.

REVV SMART RECLINER BED

An R&D programme integrating powered ergonomics, thermal comfort, sensing and connected control into a bed-mounted platform.



AUGMENTIS 2026 RESEARCH + PRODUCT DEVELOPMENT

CONCEPT VISUALISATION

FROM USER CONTEXT TO SYSTEM ARCHITECTURE

The opportunity was framed around how people already use beds for evening recline, assisted rest and temperature-sensitive comfort.

01 EVENING RECLINE

Support reading, viewing and wind-down without unstable pillow stacking.

02 ASSISTED REST

Repeatable powered postures simplify adjustment for older and mobility-limited users.

03 THERMAL COMFORT

Coordinated heating and cooling can improve perceived comfort and sleep readiness.

04 SEAMLESS CONTROL

Simple presets and wireless input reduce the effort required to change posture.

RESEARCH DIRECTION

Not another adjustable bed - a connected wellness platform coordinating posture, climate and feedback.

CONNECTED PRODUCT ARCHITECTURE

INPUTS

USER + CONTEXT

Wireless remote / presets / user signals



CORE

CENTRAL CONTROLLER

Bluetooth / power management / IP67-ready enclosure target



MOTION

ACTUATORS

Back + leg elevation

THERMAL

CLIMATE

Heating + cooling

FEEDBACK

SENSING

Status + user data

ENGINEERING PRINCIPLE

Treat mechanics, electronics, thermal modules and controls as one coordinated product system from the start.

TURNING AN IDEA INTO A VALIDATABLE SYSTEM

THE BRIEF

Augmentis required a connected wellness platform built around powered backrest and leg elevation. Structure, actuators, sensing, thermal comfort, power and controls had to work as one manufacturable system.

DESIGN RESPONSE

01 MECHANISM AND FRAME

SS304 structure, controlled pivots and actuator geometry support repeatable motion under load.

02 ELECTRONICS PACKAGING

A central control enclosure coordinates actuators, sensors, thermal modules and power.

03 CONTROL EXPERIENCE

Wireless touch control, presets and Bluetooth create a simple interface for a complex system.

04 MANUFACTURING READINESS

Laser cutting, welding, tolerances and finishing were planned with passivation and load-cycle validation.

INDESIGNLABS CONTRIBUTION

Product research / System architecture / Mechanism engineering / Electronics packaging / Control concept / DFM and validation planning

MECHANICAL PLATFORM / RECLINED STATE



2+

MOTION AXES

SS304

FRAME MATERIAL

R&D

DEVELOPMENT STATUS

CURRENT STATUS

System architecture and mechanical concept defined. Prototype, thermal, sensing and durability validation are in progress.

INDESIGNLABS

THANK YOU.
FOR YOUR ATTENTION

DESIGN . ENGINEER . DELIVER.

INDESIGNLABS.IN