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Design.Manufacture.Innovation.

Product Anatomy Workbook

Nine stages from idea to launch — what each stage is for, the deliverables, and space for your answers

THE NINE STAGES

- 01 Kickoff & Vision
- 02 Market & Customer
- 03 Ideation & Concept
- 04 Mechanical Design
- 05 Electronics Design
- 06 Prototype & First Build
- 07 Validation
- 08 DFM / Manufacturing Prep
- 09 Launch & Iterate

PRODUCT / PROJECT

TEAM / FOUNDER

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Bangalore · Hardware product design & engineering
brahmworks.com/product-anatomy

00 How to use this workbook

Work the stages in order. Read the what and why, tick only what exists, and write your own answers in the fields.

1 Start at kickoff — even with a prototype

Skipping a stage borrows risk into the next one. If you are further along, fill earlier stages quickly and honestly.

2 Read the what and why

Each stage opens with a short summary from the BrahmWorks Product Anatomy book. It is a summary, not the full book.

3 Tick deliverables only when they exist

A checkbox means the file, model, report, or prototype is real and shared — not planned and not 'mostly done'.

4 Write in plain words

Fields are for decisions, evidence, and open risks. Short notes beat polished prose. Name owners and sources.

5 Run the stage gate

Use the stage-gate page to record when each stage closed and what is still open before moving on.

6 Bring it to a conversation

Bring the workbook to brahmworks.com/contact. Tell us where you are on the anatomy and we will start from there.

The checklists are not exhaustive. Your product will add or drop items — the goal is to recognise every stage of the journey.

Fields are fillable in Adobe Acrobat / Reader, Chrome, Edge, and macOS Preview. Save a copy after filling so your answers stay with the file.

Nine stages from idea to launch

Scan the path, then open each stage for what it does, why it matters, and the deliverables to have before moving on. Click a card to jump.

01 Kickoff & Vision

Align vision, SMART goals, team, success metrics, and how you will communicate.

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02 Market & Customer

Map the landscape, pain points, and riskiest assumptions before you invent features.

PAGE 6 →

03 Ideation & Concept

Generate options, prioritise with RICE, and lock industrial design into sketches and renders.

PAGE 8 →

04 Mechanical Design

CAD, process selection, CMF, and a mechanical BOM that can be prototyped.

PAGE 10 →

05 Electronics Design

Schematics, board layout, routing, and an electronics BOM with Gerbers.

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06 Prototype & First Build

Procure, fabricate, assemble, and inspect an electromechanical working prototype.

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07 Validation

Test satisfaction and willingness to pay in a sample market; redesign the journey.

PAGE 13 →

08 DFM / Manufacturing Prep

Process finalisation, DFA, PCB DFM, firmware, QA/QC, manufacturing files.

PAGE 14 →

09 Launch & Iterate

Pre-launch, launch timing, post-launch feedback, and a review against success metrics.

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WHERE ARE YOU ON THE ANATOMY TODAY?

Name the stage you are in, what is already real, and the one thing blocking the next gate.

01 Kickoff & Vision

Lay the foundation before the build: why the product matters, how you will measure it, who is involved, and how you will talk.

WHAT

A kickoff that locks the product vision, SMART goals, core team, success metrics, and communication channels before the build starts.

WHY IT MATTERS

Without a shared why and clear measures, cross-functional work drifts. A vision translated into themes and objectives gives the team a framework for decisions.

TOOL · THEME CARDS

Outline key themes and initiatives, the business objective each one supports, and its priority level.

DELIVERABLES — TICK WHEN THEY EXIST

- ☐ Product vision statement
- ☐ Define SMART goals
- ☐ Get core team members on board
- ☐ Define success metrics
- ☐ Establish communication channels

NOTES & OPEN QUESTIONS

PRODUCT / PROJECT

PRODUCT VISION STATEMENT

What the product is and why it matters: the customer problem it solves, the value it creates, the impact on the market.

THEME CARD 1

Theme / initiative

Business objective it supports

Priority

THEME CARD 2

Theme / initiative

Business objective it supports

Priority

THEME CARD 3

Theme / initiative

Business objective it supports

Priority

SMART GOALS

Specific · Measurable · Achievable · Relevant · Time-bound. Milestones you will use to measure progress and adjust course.

Goal (specific, relevant)

How it is measured

By when

01 Kickoff & Vision — team, metrics & communication

Name an owner for every function (even if one person covers several), set the KPIs you will monitor, and agree how updates flow.

ON BOARD	FUNCTION	ROLE IN THE LAUNCH	OWNER (NAME)
☐	Executive team	Strategic direction, resources, alignment with business objectives	
☐	Project management	Activities, timelines, budget; keeps the project in scope	
☐	Product designer	User experience and interface; user needs into features	
☐	Mechanical development	Physical components; function and manufacturability	
☐	Electronics development	Electronic components; function and reliability	
☐	Firmware development	Embedded software; integration with the hardware	
☐	Procurement	Components available on time and cost-effectively	
☐	Fabrication & manufacturing	Fabrication, assembly, quality control	
☐	Operations	Logistics, distribution, and supply chain	
☐	Legal & accounting	Regulatory, IP, contracts, budget and expenses	
☐	Sales & marketing	Market research, campaigns, awareness, revenue	

SUCCESS METRICS (KPIs)
For prototyping, user testing, and quality testing.

HOW AND WHEN YOU REVIEW THEM
Who monitors, how often, what triggers a course correction.

COMMUNICATION CHANNELS
Day-to-day chat, task hub, docs, update cadence.

02 Market & Customer

Study the market from reports and secondary research first. Write what you found and where it came from — not what you hope.

WHAT

A secondary market study plus primary customer research — pain points, unmet needs, demographics, and behaviour — then an assumption–risk map and a customer journey map.

WHY IT MATTERS

Innovation without evidence builds solutions searching for problems. Validating the riskiest assumptions early means resources are not spent on the wrong direction.

TOOL · ASSUMPTION–RISK MAP

Plot key assumptions by validity and impact so the team validates the high-risk ones first.

DELIVERABLES — TICK WHEN THEY EXIST

- ☐ Secondary market research
- ☐ Primary customer research
- ☐ Assumption–risk map
- ☐ Customer journey map

NOTES & OPEN QUESTIONS

MARKET SIZE & GROWTH

From industry and financial reports — your benchmark

KEY REGIONS

Where growth or share is highest, and why

CUSTOMER SEGMENTS

Needs, motivations, purchase behaviour per segment

MARKET CHALLENGES

Supply-chain disruption, shifting trends, other risks

GROWTH DRIVERS

Technology, customer preferences, regulation

GROWTH POTENTIAL

Where the market is heading; where the openings are

COMPETITORS

Strengths, weaknesses, positioning — and your USP

SOURCES

Reports, datasets, and dates you relied on

03 Ideation & Concept

Generate solutions around one validated pain point, then run a pre-mortem before anyone falls in love with an idea.

WHAT

Cross-functional brainstorming (Lotus Bloom), a product pre-mortem, RICE feature prioritisation and a version map — then industrial design through sketch, refinement, and final renders.

WHY IT MATTERS

Ideas without prioritisation become feature bloat. Concepts without form and CMF leave mechanical and electronics teams guessing. Balance valuable features with what you can ship.

TOOL · LOTUS BLOOM

Start from a key pain point, propose ideas around it, then refine and expand them in successive rounds.

DELIVERABLES — TICK WHEN THEY EXIST

- ☐ Ideation (Lotus Bloom + pre-mortem)
- ☐ Feature prioritisation (RICE + version map)
- ☐ Concept sketches
- ☐ Digital model for mechanical integration
- ☐ Final renders

NOTES & OPEN QUESTIONS

LOTUS BLOOM — ONE PAIN POINT, EIGHT IDEAS

Write the pain point in the centre. Fill the petals with solutions; expand the best ones in a second round.

IDEA 1

IDEA 2

IDEA 3

IDEA 4

PAIN POINT

IDEA 5

IDEA 6

IDEA 7

IDEA 8

PRE-MORTEM: TECHNICAL

What could fail technically?

PRE-MORTEM: REGULATORY

Rules that could block or delay us

PRE-MORTEM: RESOURCES

Money, people, time, suppliers

03 Ideation & Concept — RICE, version map & industrial design

Score candidate features with RICE, decide which version each belongs to, then record the industrial design decisions.

REACH

How many customers benefit; depends on the funnel stage where the feature appears.

IMPACT

Effect on engagement, retention, revenue potential, or satisfaction.

CONFIDENCE

How well research supports the estimate. Solid data, higher confidence.

EFFORT

Resources, time, and complexity to build it — the cost side of the comparison.

FEATURE	REACH	IMPACT	CONFIDENCE	EFFORT	SCORE	VERSION (V1 / V2 / LATER)

Use one consistent scale for every feature. The score is a reference — combine it with stakeholder feedback to build the version map.

LEFT OUT OF V1 (AVOID FEATURE BLOAT)

Features you deliberately defer, and why

ID STAGE I — CONCEPT SKETCH

Ergonomics, ease of use, appearance, CMF, brand

ID STAGE II — REFINEMENT

Form factor and function vs user needs

ID STAGE III — FINAL CONCEPT

Renders shared; stakeholder feedback

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04 Mechanical Design

Shift from appearance to the technical framework: models, processes, CMF, and a drawing set someone else can build from.

WHAT

Engineering design (3D and component modelling, electronics integration), process selection (design and performance features, assembly, CMF), then final review and drafting.

WHY IT MATTERS

Aesthetics without a manufacturable framework fail at the bench. Dimensions, tolerances, materials, and assembly intent need to be right before prototypes burn time and money.

DELIVERABLES — TICK WHEN THEY EXIST

- ☐ Engineered CAD design
- ☐ Prototyping drawings
- ☐ Mechanical BOM

WORKING STEPS

- ☐ 3D modelling of product and assemblies
- ☐ Component modelling (dimensions, features, material)
- ☐ Electronics integrated into the framework
- ☐ Design features finalised
- ☐ Performance features identified
- ☐ Assembly & integration processes defined
- ☐ CMF & appearance defined
- ☐ Final review: dimensions, tolerances, materials

NOTES & OPEN QUESTIONS

ELECTRONICS INTEGRATION

Where boards and parts sit; access and fit

ASSEMBLY & INTEGRATION APPROACH

How parts go together; fabrication process per part

CRITICAL DIMENSIONS & TOLERANCES

What must be verified before drafting is released

PERFORMANCE REQUIREMENTS

Speed, efficiency, accuracy, durability, reliability

CMF & APPEARANCE

Colour, material, finish — brand, durability, manufacturability

MECHANICAL BOM / CRITICAL PARTS

Parts, materials, quantities; long-lead or risky items

05 Electronics Design

Identify the electronic components the features need and define the logic that runs the system — then hand a clean package to fab.

WHAT

Schematic design (component selection and connections), then board design — layout constraints, component placement, PCB routing, and BOM preparation.

WHY IT MATTERS

The board is the product's logic. Wrong parts, crowded placement, or noisy routing show up late as bring-up failures. Gerbers and a clean electronics BOM are the handoff into fab.

TOOL · FUSION

CAD software used across product design, prototyping and fabrication, design rule checks, and documentation.

DELIVERABLES — TICK WHEN THEY EXIST

- ☐ Gerber files
- ☐ Electronics BOM

WORKING STEPS

- ☐ Requirements listed from the features
- ☐ Components selected (function, performance, cost, availability)
- ☐ Schematic complete
- ☐ Layout constraints identified (size, shape, mounting)
- ☐ Components placed for size and assembly access
- ☐ PCB routed for signal flow, low interference
- ☐ BOM prepared (part number, quantity, supplier)

NOTES & OPEN QUESTIONS

FEATURES → ELECTRICAL REQUIREMENTS

What each feature needs from the electronics

BOARD CONSTRAINTS

Size, shape, mounting — agreed with mechanical

ELECTRONICS BOM NOTES

Part numbers, quantities, suppliers; open items

CRITICAL COMPONENTS & AVAILABILITY

Parts that drive cost, performance, or lead time

PLACEMENT & ROUTING CONCERNS

Assembly access, signal flow, interference

OPEN QUESTIONS FOR BRING-UP

What you will test first when boards arrive

06 Prototype & First Build

Turn the design into its first physical form — functional enough to test, honest about what it does not yet prove.

WHAT

Procure from the mechanical and electronics BOMs, fabricate with rapid methods, finish, etch and solder boards, wire and integrate, then inspect dimensions and function.

WHY IT MATTERS

The first physical system is where fit, function, and usability become measurable. A working electromechanical prototype is the gate into validation — not a polished production unit.

DELIVERABLES — TICK WHEN THEY EXIST

☐ Electromechanical working prototype

WORKING STEPS

- ☐ Components procured (online vs local vendors)
- ☐ Parts fabricated (3D printing, CNC, laser cutting)
- ☐ Levelling, buffing, finishing, post-processing
- ☐ PCBs etched and SMD soldered
- ☐ Boards tested against the schematic
- ☐ Wiring & system integration
- ☐ Dimensional inspection
- ☐ Functional testing of the full prototype
- ☐ Final inspection — defects logged

NOTES & OPEN QUESTIONS

PROTOTYPE PLAN — WHAT THIS BUILD MUST PROVE

Function, fit, usability questions it answers

FABRICATION METHOD PER PART

3D print, CNC, laser cut — and the finish needed

INSPECTION FINDINGS

Dimensional and functional results; defects

PROCUREMENT PLAN

Online vs local; lead-time risks; who orders

BOARD BRING-UP & TEST RESULTS

Etch / solder / test notes against schematic

CHANGES BEFORE VALIDATION

What to fix so the prototype represents the product

07 Validation

Put the working prototype in front of real customers in a setting that matches the real market. Test satisfaction and price.

WHAT

Prepare a lean but representative prototype, set up a sample market, design tests for satisfaction and willingness to pay, set KPIs, analyse, iterate, and redesign the customer journey from real use.

WHY IT MATTERS

Launching without evidence of value and price is expensive. Early feedback on features, usability, and feature–price combinations reduces the chance of a full-scale miss.

DELIVERABLES — TICK WHEN THEY EXIST

- ☐ Customer survey report
- ☐ Redesigned customer journey map

WORKING STEPS

- ☐ Prototype functional and representative, still lean
- ☐ Sample market set up to match the real market
- ☐ Tests designed: satisfaction and willingness to pay
- ☐ Feature–price combinations included
- ☐ KPIs set and a way to capture them
- ☐ Feedback analysed; iteration agreed
- ☐ Journey map redesigned from real use

NOTES & OPEN QUESTIONS

SAMPLE MARKET

Where, who, and why it matches the real market

KPIS AND HOW THEY ARE CAPTURED

Defined before the test, not after

RESULTS — WILLINGNESS TO PAY

Which offer and price drew real commitment

TESTS & FEATURE–PRICE COMBINATIONS

What you will ask, observe, and offer

RESULTS — SATISFACTION & USABILITY

What users liked, struggled with, ignored

JOURNEY CHANGES & DECISION

Touchpoints and emotions to fix; proceed or iterate

08 DFM / Manufacturing Prep

Make the validated design repeatable: processes, assembly, board rules, firmware, and quality gates before the first build.

WHAT

After validation: process finalisation, design for assembly, PCB design for manufacturing, firmware and app development, and QA/QC — then manufacturing files and a final BOM.

WHY IT MATTERS

A prototype that only one engineer can build is not a product. Manufacturing prep makes the design repeatable before volume.

TOOL · SERVICE BLUEPRINT

Maps customer actions and touchpoints to the front-stage and back-stage systems needed to deliver them.

DELIVERABLES — TICK WHEN THEY EXIST

- ☐ Manufacturing files
- ☐ Final BOM

WORKING STEPS

- ☐ Processes finalised: material, colour, finish
- ☐ Volumes and costs estimated from capacity and demand
- ☐ DFA: moulding drafts, sink marks, snaps & fits
- ☐ PCB DFM: size, design rule checks, inspection
- ☐ Firmware & app written, tested, refined
- ☐ QA / QC: function, performance, durability
- ☐ Service blueprint drafted

NOTES & OPEN QUESTIONS

PROCESS, MATERIAL & VOLUME DECISIONS

Process per part; volume and cost assumptions

PCB DFM NOTES

Board size, DRC results, inspection findings

QA / QC TEST PLAN

Tests for function, performance, durability

DESIGN-FOR-ASSEMBLY RISKS

Drafts, sink marks, snaps & fits, placement

FIRMWARE & APP STATUS

What is done, tested, and still open

TOP DFM RISKS & OWNERS

The issues most likely to stop the first build

09 Launch & Iterate

Plan the launch while development finishes — and build the feedback loop before the first unit ships.

WHAT

Pre-launch campaigns, reach through the right audience and partners, a launch date timed to the market, post-launch feedback loops, and a review against your original KPIs.

WHY IT MATTERS

Development does not end at first ship. Awareness, early sales, and structured learning set up a sustained market presence — and the next iteration.

DELIVERABLES — TICK WHEN THEY EXIST

- ☐ Product launch strategy
- ☐ Stakeholder feedback

WORKING STEPS

- ☐ Pre-launch campaign planned
- ☐ Target audience and reach defined
- ☐ Collaborations / affiliations identified
- ☐ Launch date chosen (trends, seasonality)
- ☐ Post-launch feedback live (surveys, in-app prompts)
- ☐ Review against KPIs and success metrics

NOTES & OPEN QUESTIONS

PRE-LAUNCH CAMPAIGN

Trailers, sneak peeks, content, community forums

LAUNCH CHANNELS & PARTNERS

Where it is sold and announced; collaborations

POST-LAUNCH FEEDBACK MECHANISM

Email surveys, in-app prompts, support

TARGET AUDIENCE

Who you must reach first, and where they are

LAUNCH DATE & REASONING

Market trends and seasonal timing

REVIEW: KPIS, STAKEHOLDER FEEDBACK, LESSONS

What worked, what to change next

Stage-gate summary

Tick a stage only when its deliverables exist. Record the date and what is still open — the gaps are the most useful part of this page.

DONE	STAGE	GATE DELIVERABLES	DATE CLOSED	OPEN ITEMS / NOTES
☐	01 Kickoff & Vision	Vision, SMART goals, core team, metrics, channels		
☐	02 Market & Customer	Secondary + primary research, assumption–risk map, journey map		
☐	03 Ideation & Concept	Ideation, RICE / version map, sketches, digital model, renders		
☐	04 Mechanical Design	Engineered CAD, prototyping drawings, mechanical BOM		
☐	05 Electronics Design	Gerber files, electronics BOM		
☐	06 Prototype & First Build	Electromechanical working prototype		
☐	07 Validation	Customer survey report, redesigned journey map		
☐	08 DFM / Manufacturing Prep	Manufacturing files, final BOM		
☐	09 Launch & Iterate	Launch strategy, stakeholder feedback		

BIGGEST OPEN RISK ACROSS THE PROJECT — AND THE NEXT DECISION

One risk, one owner, one date. If it is unresolved, it belongs in your first conversation with an engineering partner.

Next steps with BrahmWorks

You do not need a finished deck or a locked design. Tell us where you are on the anatomy and we will meet you there.

Where are you on the anatomy?

- ☐ Idea — kickoff and research
- ☐ Concept — ideation and industrial design
- ☐ Prototype — mechanical, electronics, first build
- ☐ Manufacturing prep — validation, DFM, launch

WHAT YOU WANT HELP WITH NEXT

Pitch your idea

brahmworks.com/contact →

Bring this workbook — filled or half-filled. A clear stage and an honest open risk are enough to start.

WHAT TO BRING

- Your stage on the anatomy and what already exists
- The job the product must do, in the user's words
- The biggest open risk from the stage-gate page

Product Anatomy online

brahmworks.com/product-anatomy →

The nine stages as a scannable web page, with the complete checklist.

Resources for founders

brahmworks.com/resources →

Fillable worksheets, playbooks, and guides for hardware founders — including the Hardware Founder Toolkit.

Partner, not vendor. Whether you are at idea, concept, prototype, or manufacturing prep, we work the next stage with you — design, engineering, and build.