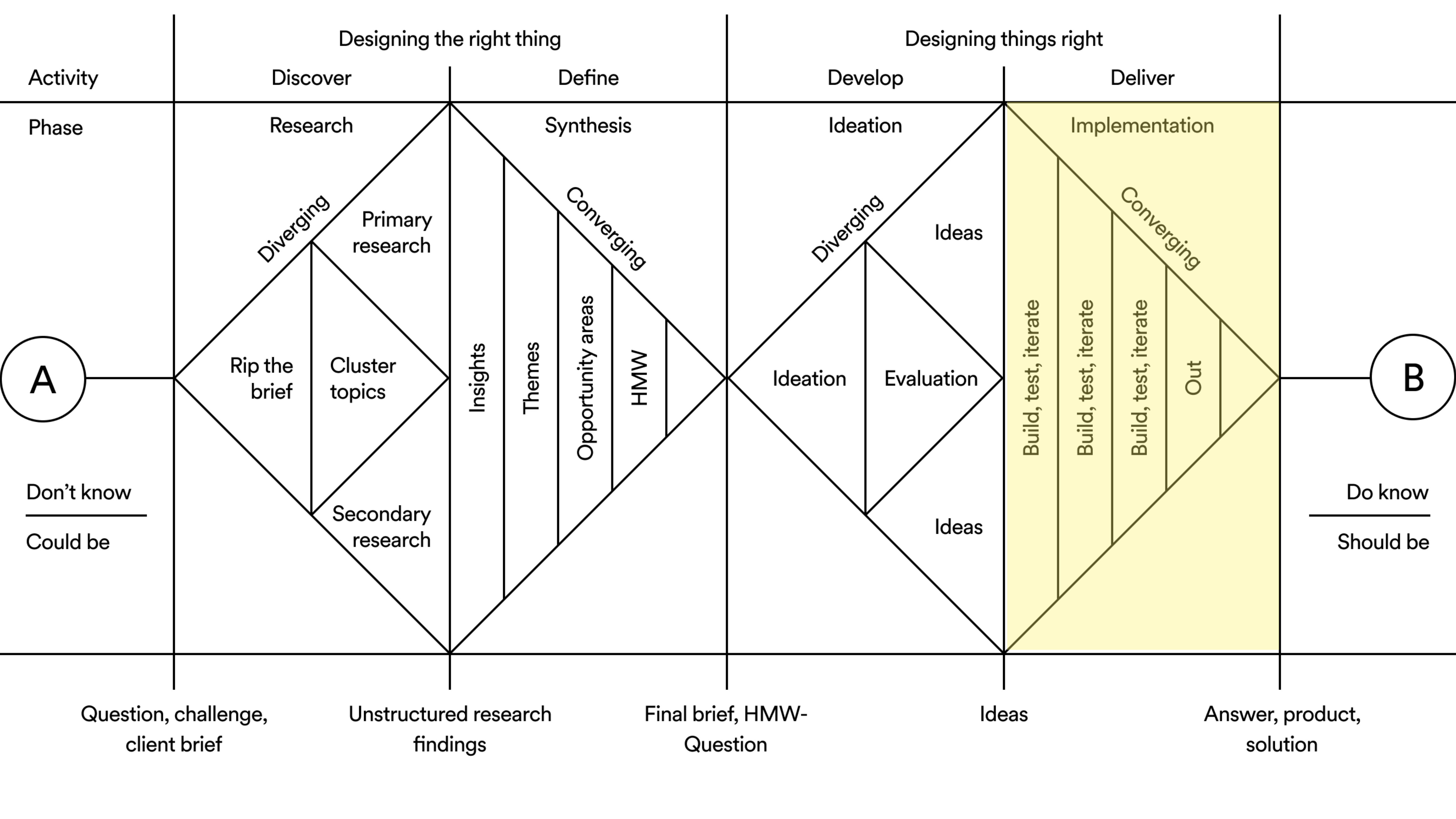


ADDA5022

CHANGEMAKERS: CREATIVITY AND VALUE CREATION

Session 5



PRODUCT DESIGN SPECIFICATION (PDS)

What is it?

(PDS) is a document that contains all the requirements, constraints and specifications that a new product must have.

Why use it?

Product design specifications provide clarity during the design process increasing the likelihood of the final outcome successfully answering the design brief.

Why use it?

The PDS is a single document that details what the product needs to do, look like and deliver for the end user. Guaranteeing the designer has a clear goal for what the finished product will be – saving time and money.

What to include?

- **Introduction:** Brief product overview.
- **Scope:** Defines market position, target audience, purpose, and financial/time limitations.
- **Functional Requirements:** Details materials, manufacturing, dimensions, and expected lifespan.
- **Experience:** Covers user experience, aesthetics, ergonomics, and maintenance.

What to include?

- Safety: Lists safety considerations, standards, and testing procedures.
- Transport: Addresses packaging and shipping needs.
- Environmental: Notes recycling and disposal guidelines.
- Questions: Encourages listing design team queries for clarity.

1.Introduction

Brief Product Overview:

A concise summary of the product's concept and intended purpose. This section should explain the product's primary function, core appeal, and what it seeks to accomplish for its users, serving as a high-level introduction for team members.

2.Scope

Market Position: Defines the product's intended place within the market and its competition, clarifying where it stands in relation to similar products.

Target Audience: Specifies the primary users, detailing age, interests, or needs that align with the product's design and purpose.

2. Scope

Purpose: Explains the product's core mission or reason for development, such as meeting a specific need or enhancing the user's experience in a certain area.

Financial and Time Limitations: Lists any financial constraints on the project budget and expected timeline for development and production.

3. Functional Requirements

Materials: Identifies the main materials required for the product, ensuring they meet durability, safety, and aesthetic needs.

Manufacturing: Outlines essential manufacturing details, covering how parts will be produced, assembled, and finished.

3. Functional Requirements

Dimensions: Specifies size requirements to ensure ease of use, functionality, and compatibility with the intended environment.

Expected Lifespan: Sets out the product's expected durability and frequency of use, defining how long it should function effectively.

4. Experience

User Experience: Describes how users will interact with the product, focusing on ease of use, engagement, and satisfaction in operation.

Aesthetics: Outlines visual elements, such as color, form, and style, that enhance the product's appeal and align with the brand's identity.

4. Experience

Ergonomics: Details aspects related to the product's handling, usability, and comfort for the intended user.

Maintenance: Lists care guidelines and any required upkeep, such as cleaning, battery replacements, or part replacements, to keep the product functional.

5. Safety

Safety Considerations: Notes any potential risks associated with the product's use, and how these will be mitigated, such as avoiding sharp edges, hazardous materials, or small parts.

Safety Standards: Lists relevant regulatory safety standards that must be met, ensuring the product is compliant and safe for use.

Testing Procedures: Specifies required safety and quality tests to verify durability, functionality, and compliance with standards.

6. Transport

Packaging: Describes packaging requirements to protect the product during shipping, detailing materials, design, and organisation of components.

Shipping Requirements: Identifies considerations for the product's transport, including box size, weight, and any special handling needs for safe and efficient distribution.

7. Environmental Impact

Recycling: Establishes goals for using recyclable materials to reduce environmental impact, covering both the product and its packaging.

Disposal Guidelines: Provides guidance on how to responsibly dispose of or recycle the product after its usable life, especially for components that may have environmental impacts.

8. Questions

Design Team Queries: Lists outstanding questions or considerations for the design team that may affect product development. These could address potential improvements, material alternatives, or additional features that enhance product quality or functionality.

Things to consider:

- Ensure points are clear, focussed and based on fact rather than opinion.
- Remember, this is a starting point for development and does not have to provide an answer to every question.
- Don't over-specify as this could limit creativity. E.g
 - Offer a range of dimensions for size.
- Don't be too vague either! E.g Don't say the product should be "roughly this big" state a min and max range instead.

Also consider noting any Issues and Challenges that may rise during the design process:

A Issues/Challenges column can be included in a Product Design Specification and is used to highlight potential difficulties, risks, or limitations that may arise during the design, development, or production of the product.

EXAMPLE PDS

(A.I GENERATED)

BUILD-A-BOT





Introduction

The Build-a-Bot Kit is an educational toy that introduces children to robotics and engineering concepts. Designed for kids aged 8-12, the kit includes various parts that allow users to build, customise, and program simple robots. The toy encourages hands-on learning, creativity, and problem-solving skills.

Basic Operation

The kit includes parts for constructing multiple robot models, a user-friendly guide, and a child-safe screwdriver. Once assembled, kids can connect the bot to a mobile app or a basic remote to control movement and lights. The robot can be taken apart and rebuilt in different configurations, providing repeat playability.





Scope

Target Market: Kids aged 8–12 with an interest in STEM, as well as parents and educators looking for educational toys that enhance learning through play.

Financial Limitations: Total budget for development and production is capped at £200,000.

Time Restrictions: Production should be completed within six months to align with Christmas availability.

FUNCTIONAL REQUIREMENTS

Materials: Durable, child-safe plastic for parts, with a Bluetooth-enabled control module.

Manufacturing Process: Injection moulding for plastic parts, with parts organised into trays for easy assembly.

Dimensions:

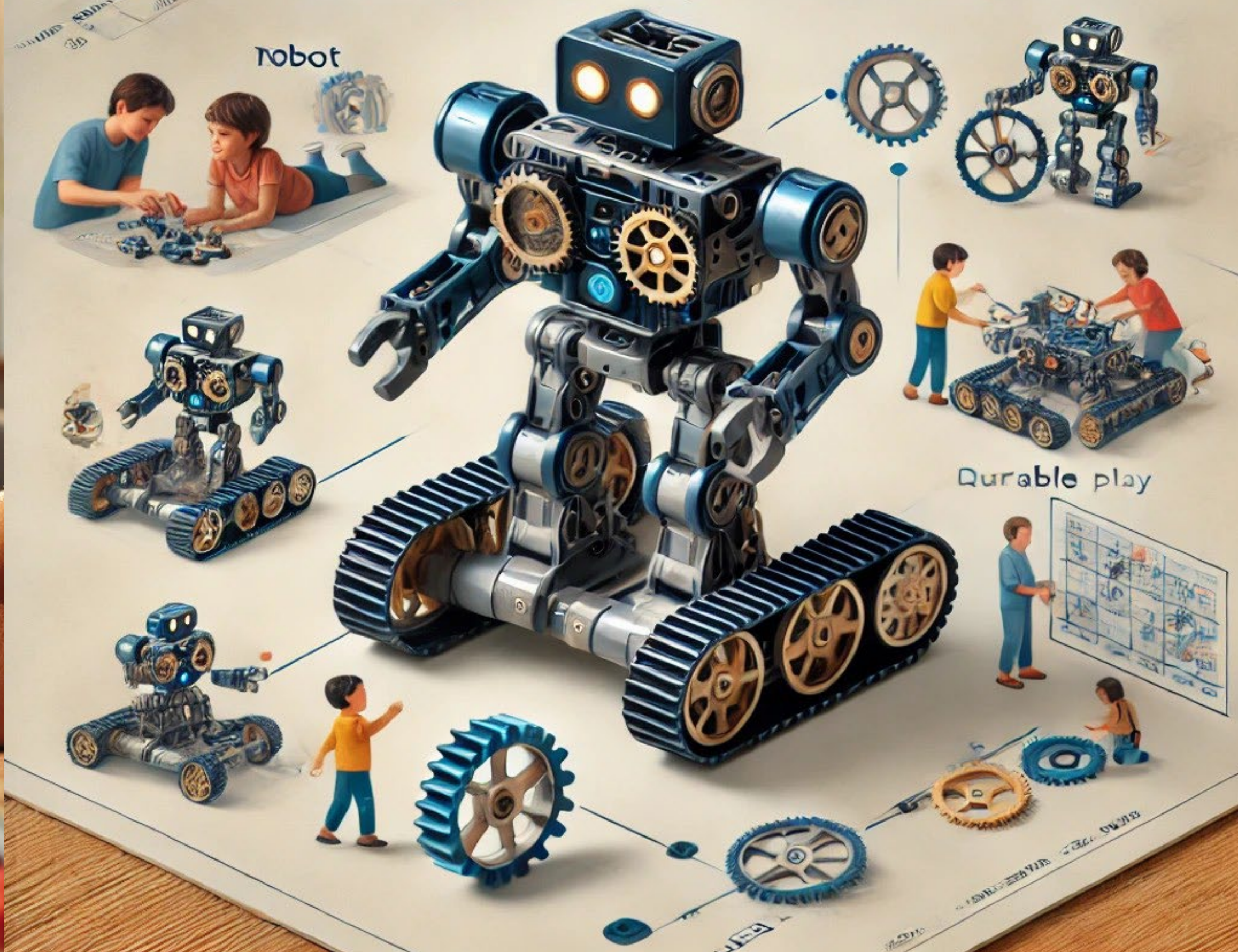
Height: 10–15 cm Width: 8–12 cm

Weight: Less than 1 kg (boxed)



Lifespan[®]

Quality construction meant to a play years, or ~~with~~ ~~on~~ meant to repeated assembly & assembly over several years.



Lifespan/Reliability:

Designed to last for a minimum of three years under regular use.

Issues/Challenges:

Balancing durability with a lightweight design.

Ensuring child-friendly assembly and reassembly without compromising strength.

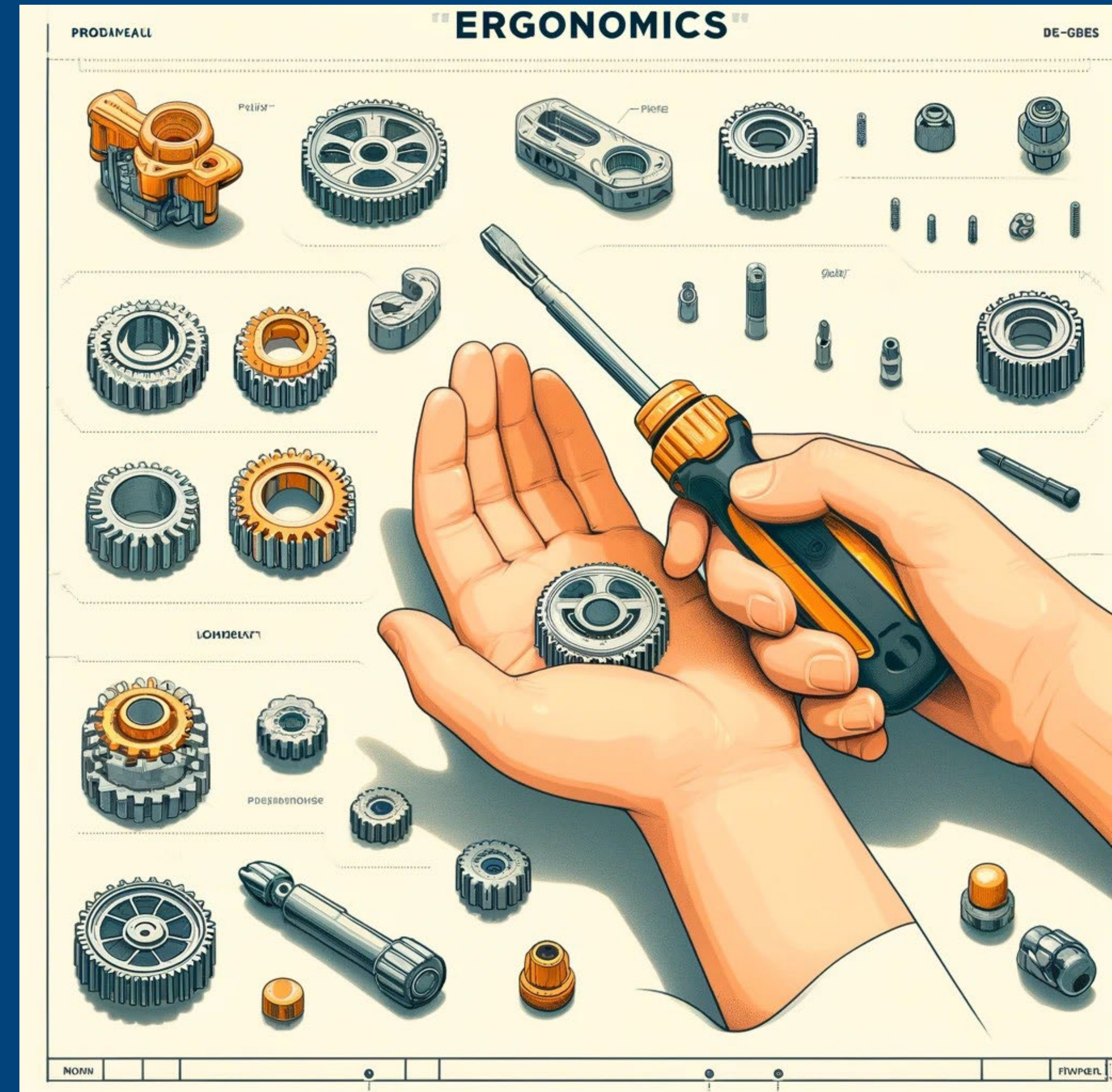
EXPERIENCE

Aesthetics:

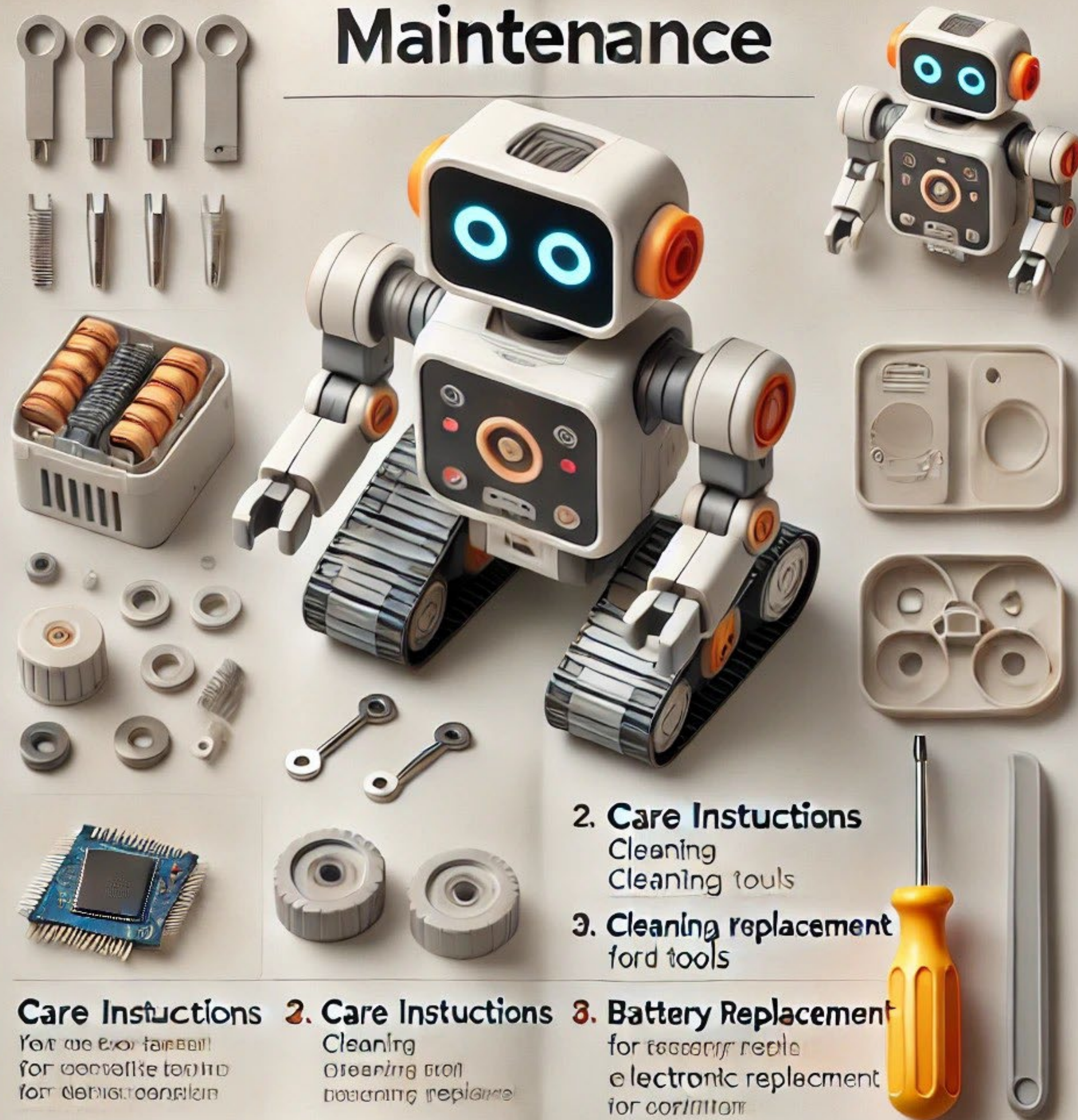
Bright, gender-neutral colours (e.g., blue, green, orange) to appeal widely to children.

Ergonomics:

Parts sized for children's hands, with easy-to-grip tools and large screws that are easy to turn.



Maintenance



Maintenance:

Requires regular cleaning; all parts are dishwasher-safe. Replacement parts (e.g., screws, gears) are available.

Issues/Challenges:

Ensuring the product is visually engaging while keeping production costs manageable.

SAFETY

Safety Considerations:

Non-toxic, BPA-free materials.

No small parts to avoid choking hazards.

Safety Standards:

Complies with EN71 (European Union) toy safety standards.





Testing:

Includes drop, stress, and component durability tests.

Issues/Challenges:

Ensuring compliance with stringent safety standards while keeping materials cost-effective.

TRANSPORT

Packaging:

Eco-friendly cardboard box with moulded inserts to keep parts secure during transit.

Shipping:

Compact and lightweight to minimise shipping costs.
Dimensions and weight optimised for international distribution.

Issues/Challenges:

Balancing protective packaging with environmentally friendly materials.



ENVIRONMENTAL



Recycling:

80% recyclable materials.
Packaging and components can be recycled at designated facilities.

Disposal:

Instructions for disposal of electronic components and plastic recycling are included.

Issues/Challenges:

Sourcing eco-friendly materials that meet durability standards.

QUESTIONS



1. Can more modular pieces be added to enhance customisation options?
2. Should additional coding or app-based features be incorporated?
3. What balance is optimal between ease of use for younger users and challenge for older children?

TASK: USE THE PROVIDED TEMPLATE TO CREATE
A PDS FOR YOUR CHOSEN CONCEPT.