

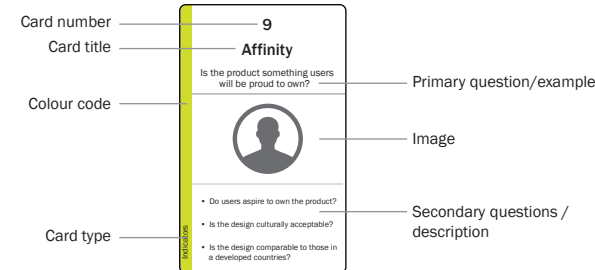
Introduction

D-Tool has been created to help support decision making during the design of products for Low Income Economies. The tool employs a product assessment spider web with eight indicators that draw attention to key considerations for the evaluation of concepts and re-design of existing products.

The assessment spiderweb is supported by the **contextualisation cards**, **indicator cards**, and **product case study cards**.

Using the cards

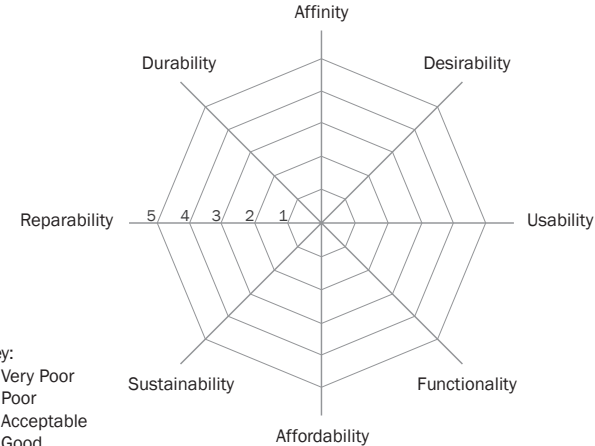
1. Download a blank assessment spiderweb from www.bridgingthedivide.org
2. Understand the context of Low Income Economies with the **contextualisation** cards
3. While designing a product, continually assess the concepts using the **indicators** cards and the assessment spiderweb
4. Identify best practice from the **case study** cards



Assessment

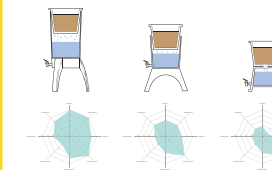
Eight assessment indicators have been arranged in a spiderweb for rapid product assessment. When analysing a product, each indicator criteria is considered and given a score between zero and five depending how it meets the criteria (zero being very poor and five being very good). To aid this assessment, the **indicator cards** provide questions to be used when evaluating a design. A PDF of the spiderweb can be downloaded from bridgingthedivide.org. Once each indicator has been given a score by placing a dot, these are joined up and the centre shaded. The completed spiderweb visually displays the strengths and weaknesses of the product.

Spiderweb



Concept Selection

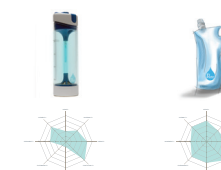
Use the assessment web to evaluate proposals during the design and prototype phase.



Quickly shows strengths and weaknesses of multiple design concepts.

Product Re-design

Use the assessment web to evaluate an existing product to guide a re-design.



Highlights areas which need to be improved.

Product Assessment

Use the assessment web to evaluate a product to identify if it meets your needs.



Highlights if the product is suitable for the environment in which it will be used.

Contextualisation

Contextualisation cards highlight factors which should be considered during the design process. These external factors influence a products uptake and longevity.

When designing a product for a Low Income Economy, it is necessary to understand the context, users, methods of distribution and manufacture. This information helps guide decision-making during the initial stages of the design process.

1

Funding

Who is funding the project?



- How much funding is available?
- Is the product sold or donated?
- Is the product designed for an individual or community?

2

Users

Who are the product users?



- What are the users' aspirations?
- Can the users be involved in the design process?
- What is the research strategy?

3

Need

What is the local need?



- What are the user needs?
- Has time been spent to fully understand the community?
- Are there any unexpected needs?

4

Distribution

How will products get to users?



- What is the size of the product?
- Will the product be distributed to users by the local community or charity members?
- How is the product acquired?

5

Scale

Can volume be achieved?



- Can the design be scaled?
- Is the product suitable for multiple regions?
- Can it be adapted for different areas?

6

Manufacturing

Where are the products made?



- Is the product manufactured locally, regionally or globally?
- What are the constraints of the location of manufacture?
- What are the import costs?

7

Quality

Is the product quality acceptable?



- Is the product of appropriate quality?
- Is it well designed and made?
- Has the product been designed to last?

8

Convenience

How convenient is the product?



- Can the products be easily incorporated into users lifestyle?
- Will it enhance quality of life?
- Is the product simple to use?

Background

D-Tool was developed from PhD research conducted by Dr Timothy Whitehead and supervised by Dr Mark Evans and Dr Guy Bingham. The aim was to support the design and assessment of products intended for use in Low Income Economies

Research

This research was carried out using of a literature review, the analysis of 64 products, a survey, interviews with 43 leading product designers, and a case study with a Social Enterprise in Myanmar (Burma). The information gathered was thematically analysed and used to create D-Tool to guide designers and NGOs. Further details on the PhD research can be accessed at: dspace.lboro.ac.uk/2134/17477

Indicators

Indicator cards can be used in conjunction with the product assessment spiderweb to help analyse a design. Each card has a leading question followed by three supplementary questions. Considering and answering these questions will inform design decision making and ensure products are suitable for users.

Indicator cards are used during the design of products, but can also be used to help evaluate an idea or solution.

9

Affinity

Is the product something users will be proud to own?



- Do users aspire to own the product?
- Is the design culturally acceptable?
- Is the design comparable to those in a Low Income Economies?

10

Desirability

Is the product desirable?



- Is there evidence of industrial design?
- Will it increase the users social status?
- Is the product culturally appropriate?

11

Usability

Is the product easy to understand and use in different cultures?



- Do users need to learn new skills?
- Is the product designed to prevent misuse?
- Will it fit into the lifestyle of users?

12

Functionality

Are the product functions adequate for the task?



- Are the functions needed by users?
- Is it reliable?
- Are the choice of functions appropriate for the task and users?

13

Affordability

Is the product affordable?



- What is the income of users?
- What is the initial product cost?
- What is the total cost of the product during its lifetime?

14

Sustainability

Is the product environmentally and economically sustainable?



- What materials are used?
- How will the product be recycled?
- Can the product be designed to facilitate sustainability?

15

Reparability

Can the product be efficiently repaired or replaced if it fails?



- Can it be repaired using local skills?
- Are parts readily available?
- If a warranty is available, how easy is it to return the product?

16

Durability

Is the design robust enough to withstand the environment?



- How long will the product last?
- Are the materials robust?
- Can the product be secured to prevent it from being stolen?

Case Study

Case study cards provide examples of best practice in the design of products for Low Income Economies. These examples are linked to the indicator cards with one case study per indicator. These cards provide a short description of a case study and reference link for further information.

During the design and development stage it is recommended that the design team evaluate existing products to understand successful approaches to design for Low Income Economies.

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Rabbit Water Filter

Example of Affinity



The Rabbit water filter has been designed to take into account user aspirations and turned what was a purely functional product into something that users want to own and use.

www.hydrologic.com

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One Laptop per Child

Example of Desirability



The design of the OLPC combines essential functions, easy to use UX with strong industrial design. This has resulted in a desirable product for both developed and developing economies.

www.olpc.com

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Lifeline Radio

Example of Usability



The wind up, solar powered radio has been designed with support from users to make it simple and easy to use in different environments and cultures.

www.freeplayenergy.com

20

Re-motion Knee

Example of Functionality



The Re-motion knee uses a multi-pivot joint to provide 165 degrees of freedom. A purely functional design to enable sitting, squatting and swinging.

www.d-rev.com

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Treadle Pump

Example of Affordability



This low cost, locally manufactured agricultural pump has been designed to increase crop yield and household income to enable payback of the initial investment during the first year.

www.ideo.org

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Chulha Stove

Example of Sustainability



A low smoke stove that uses biomass fuel and is manufactured using local materials and artisans. The design supports the local economy and reduces environmental impact.

www.lowsmokechulha.com

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NeoNurture

Example of Repairability



The incubator is primarily made from car parts which are an abundant local resource in Low Income Economies. It uses existing supply chains for the car industry and can easily be repaired.

www.designthatmatters.org

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Hippo Roller

Example of Durability



The 90l water transportation device enables women and children to collect 5 times more water than buckets. It is designed to 5-7 years in hostile environments.

www.hipporoller.org



D-Tool

Supporting Product Design in
Low Income Economies



D-Tool has been created to support
New Product Development (NPD)
during the design of products for
those living in Low Income
Economies (LIEs).

Further details can be found at:

bridgingthedivide.org

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