

GUIDE:

Brainstorm Sudoku

Why you should use this tool

A Brainstorm Sudoku is a structured and simple approach to help you go from having identified a circular challenge or opportunity to generate new, specific ideas.

The result of the process is a comprehensive collection of structured ideas from which to choose for further investigation and development.

The goal of well-structured brainstorming is not to create the perfect idea. Rather it is to generate a large number of ideas through collaboration and openness to wild solutions.

Step 0 • Preparation • 5 min

Print out the Brainstorm Sudoku (A4) and organize them as illustrated in the picture. The team has to be able to gather around it.

Be ready with post-its - make sure each team member has their own post-its.

Tip:

Give team members different colored post-its to track people's ideas.

Step 1 • Agree upon the question in the center of the sudoku • 10 min

Identify the development potential you would like to translate into ideas.

Place the challenge at the center of the Brainstorm Sudoku.

Step 2 • Pick circular inspiration cards - 10 min

Take a close look at the circular inspiration cards. Discuss in the team, which of the cards makes you curious and/or have the biggest potential to help you generate novel and unexpected ideas.

Pick eight cards and place them in the eight central spots around the center of the Brainstorm Sudoku.

When satisfied with your choices, move the cards out in each of the eight surrounding matrixes. These eight cards will serve as the starting point of the brainstorm session.

Tip:

Try to pick one or two cards that challenge you to think in completely new directions. This can spark unexpected ideas or help you widen the scope of your ideation.

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Step 3· Brainstorm circular ideas pt. 1 · 15 min

Do a brainstorm individually and in silence to generate as many ideas as possible based on the eight inspiration cards. The team should spend 4-5 minutes on this brainstorm. Write down the ideas on Post-it notes. When time is up, every team member reads his/her own ideas out loud to the entire team.

Other team members are free to ask questions and write down new ideas during presentation rounds.

Tip:

An idea is characterized by being a concrete solution to a challenge. Don't be afraid to be concrete and come up with specific circular solutions and initiatives for your business.

Step 4 · Brainstorm circular ideas pt. 2 · 10 min

Do another brainstorming session - similar to the previous one - 4-5 minutes individually where you try to fill out empty spots around the eight inspirations cards.

When you finish the brainstorm session, every team member reads his/her own new ideas out loud to the entire team. In the end, everybody should know all the generated ideas.

Tip:

Continue the brainstorming until you fill out all the empty spots to encourage yourselves to push for a large quantity of new and maybe unexpected ideas.

Step 5- Dot voting 10 min

It's now time to go from creating ideas to making decisions. The purpose of this step is to agree on the idea that you want to develop into a circular concept.

You will make the decision through dot voting. Each team member gets five dots for her/him to place on the ideas they feel have the greatest potential to answer your challenge or "how might we" question.

Team members place their votes quietly. The conversation should not resume until all participants have placed their dots. No lobbying during the voting process. If you have a tie among top ideas, the team votes again to establish a clear winner. Re-issue the same number of votes to each team member, but only allow votes on the top ideas (usually two-four) that emerged from the previous vote.

The selected idea will serve as the starting point for the following conceptualization of your circular solution.



Repair

What if your solution was designed to be repairable?

Product repair involves returning a product to good working condition by replacing or repairing major components that are faulty or close to failure, and making 'cosmetic changes' to update the appearance of a product, using methods such as resurfacing, repainting, etc.

Reuse

What if your solution enabled reuse?

Reuse is the action or practice of using an item, whether for its original purpose or to fulfill a different function, thereby re-functioning the item. It should be distinguished from recycling, which is the breaking down of used items to make raw materials for the manufacture of new products.



Recycle

What if your solution used recycled materials?

Recycling is the process of converting waste materials into new materials and objects. Recycling can prevent the waste of potentially useful materials and reduce the consumption of fresh raw materials, thereby reducing energy usage, air pollution, and water pollution.

Mono-Material

What if your solution only used one material?

A product composed of a single type of material or a product with components that each are made of a single type of material that can be split apart.

Design for **Disassembly**

What if your solution was designed for disassembly?

Design for disassembly means working with materials in a manner that allows for material separation once the product is discarded or in need of repair. Products are designed intentionally for material recovery, value retention, and meaningful next use. It can e.g. be crucial to work with easy material indication and optimise for a short time for disassembly.

Design for **Modularity**

What if your solution was designed to be modular?

Design that is based on a modular approach. A product contains several separable pieces that can be assembled in different ways by the user. Design for modularity can also be a series of individual products that may be purchased and used alone, or collected, refurbished, remanufactured and/or assembled in different ways over time.



Repurpose

What if your solution could serve a whole new purpose?

Repurposing is about identifying new possibilities for use of discarded products.

Repurposing requires thinking outside the box and possibly look for repurpose potential outside the industry you operate in.



Refurbish

What if you repaired returned products and parts?

Refurbishing is about repairing returned products after a certain period of use so that it satisfies certain mechanical specifications and operating conditions within the limitations of what is considered acceptable. This is done by rebuilding or repairing major components that are close to failure. The main difference from remanufacturing is that refurbishment is usually less rigorous and costly and involves less dis/re-assembly.

Service Kits

What if your solution included a service kit?

A kit that contains tools, equipment and/or spare parts that helps users or companies to maintain and repair products.

Service kits serve to extend the use phase of products.

Sourcing

What if materials selected favoured the environment?

Sourcing is about the selection of resources and materials that go into product. When choosing materials, consider durability, renewability & recyclability.

You can also consider aspects such as where the materials originate from and how the working conditions are for the people dealing with the materials.

Take-Back Systems

What if you were able to get your products back?

A take-back system is when suppliers collect used products/parts/materials from users and make them go back to the same or a new loop of use.

Take-back can both be applied at the end of the product life time and/or be a service that enables to extend the current use cycle of products.

Cascade

What if old materials could still be used?

Cascading is the sequential and consecutive use of resources. When cascading, new applications of processed materials usually have a lower demand for resource quality. It is important to consider the cascading process early in the design process.

A material starts its lifetime at the highest quality possible, and the material quality naturally declines over time.



Manufacturing

What if your solution were manufactured for a circular purpose?

Manufacturing concerns improvement of circularity in production and considerations include:

How to favour cleaner production, equipment toxicity, production waste, design for reduced energy consumption and prioritising renewable energy.



Spare parts on demand

What if parts are replaced when the user needs it?

Replacement of malfunctioning parts of a product or system that is delivered after the user contacts the supplier. The spare part on demand is offered on time where no formal agreement is needed. Sometimes, the supplier can act as a provider of other companies spare parts, centralising and simplifying the process for users. This type of agreement is the most common within spare parts services.

Spare part kit

What if you could provide relevant actors with spare kits?

Package containing spare parts for a specific repair task.

The user can choose between different parts that form a spare kit - either from a supplier or sub-supplier depending on the task to be solved.

Upgrade

What if we extend the lifetime of the product via upgrades?

The product is still functional, but new changes, evolution and new features are added to extend the lifetime of products.

Upgrades can extend the product value by enhancing the function of an existing product sometimes beyond its original design condition. Potentially, it can also reduce value loss from continued use of parts and products.

Design for multifunctionality

What if products could fulfil multiple functions?

When designing products/services, consider how they could fulfil more than one function. Multi-functional products can potentially help reducing the overall amount of products and may be usable by different user groups.

Recover

What if the materials of your products could be recovered?

Energy recovery happens by incinerating materials since the material characteristics no longer satisfy any application whatsoever. The recovery must happen only after materials have been recycled more than once. The main problem when recovering materials is toxic smoke emitted by certain materials and additives that was added to the product.



3D scanner

What if you could share your design with a 3D scanner?

A 3D scanner is a camera capable to take "3D pictures", recording not only the colour of a pixel, but also its position in the space.

It creates a 3D file, a digital representation of the object that can be shared with peers around the world.



3D printer

What if your solution could be produced on a 3D printer?

The machine creates a physical version of a 3D virtual model.

In the process, the model is sliced in thin layers and the machine draws these layers with some sort of solid material.

Layer by layer the entire object is created. It allows creating complex geometries in different materials.

Large CNC mill

What if your solution could be produced on a CNC mill?

A CNC milling machine is a 3 axis machine (can move along X, Y, Z or a combination of these) that moves along a path with a spinning cutting tool.

It allows to cut in every direction, including vertically (drilling a hole). It's commonly used to make furniture and works with wooden panels.

The cut parts are assembled together to create a solid, stable, 3D object.

Laser cutter

What if your solution could be produced on a laser cutter?

A laser cutter uses a highly focused light to melt or burn away a small amount of material, to divide the part from the rest of the slab.

These parts must be assembled to create the final piece.

It is one of the easier machine to use and faster to prototype, it works well for final products as well.

Vinyl cutter

What if your solution could be produced with a vinyl cutter?

A vinyl cutter uses a sharp blade mounted over the moving head of a plotter machine. In this way, it can cut over sheet-like materials re-creating a vector image in very little time.

Useful for early stages of prototyping and product customizations, vinyl cutter are cheap and easy to maintain, and materials can be easily bought in bulk.