

Frugal Innovation Classroom Course

Creative problem solving

MODULE 3



How to do better with less?

COURSE CONTENT

1. The business case for Frugal Innovation
2. Market opportunities for frugal innovations in Poland/Hungary/Croatia/Ireland/UK
- 3. Creative problem solving**
4. New market development, human centered design and prototyping
5. Sustainability and social inclusion in frugal innovation
6. Financial planning for innovation
7. Management of frugal innovations

Do you know that...

You can use modules in the way you wish. This course is tailored for individual needs. You can read full modules, you can focus on the main terms, which will be highlighted in each module, you can find examples or try to do the test. Either way we are sure that we will make you read more about how to profit from doing business frugally.

Icons you may come across in the course



Important term



Example



Test



Activity



Video



Source

Creative problem solving

Tired of books and articles, in which you cannot find practical and useful knowledge.

Start the module **Creative problem solving**, which will provide you with information on:

- Why creativity is important.
- Techniques which can enhance human creativity, like brainstorming, brainwriting, nominal group technique.
- Creative work environment.
- Process of innovation
- Various sources of frugal innovations.
- Design thinking

The module will provide you with practical knowledge on how to boost creativity of human resources and thus be innovative.

We advise you to join the whole module.



Creativity

No matter if we talk about high-tech or frugal innovation,
creativity remains the most pivotal source of innovations.

Creativity and **ingenuity** feature human beings.

You, your family members, your colleagues
and your co-workers – they are all creative.

So...

How can human creativity be stimulated?

Let's think about creativity in general.

When are we creative?

How can the creativity be described?

Do you know that...

The following foods promote brain health:

- **Oily fish** (rich in omega-3 fatty acids)
- **Walnuts and pecans** (rich in antioxidants)
- **Fruits and vegetables with dark skins** (rich in Vitamin E)



Fantasy

When we think about something new, maybe an idea of frugal innovation, the first stage of such thinking can be called: **fantasy**.

Thoughts like:

- “would it be better if...”,
- “I would change the world if ...”
- “I’ve got this brilliant idea ...”

often come to our mind at this stage.

Do you know that...

Daydreaming is like a gym for your brain. It helps to keep your working memory in good condition



designed by freepik.com

Vision

Then our fantasy turns into more clear and detailed idea, which is called

vision. At this second stage, you would probably think:

- “I could do it this way ...”
- “This would be a great business, but I would need ...”
- “This is feasible, but I will have to organize the following resources ...”

Both fantasies and visions are crucial in creativity process. Everyone is able to daydream and have visions. Can you imagine that a few people daydream about the same solution and they can co-operate with each other?

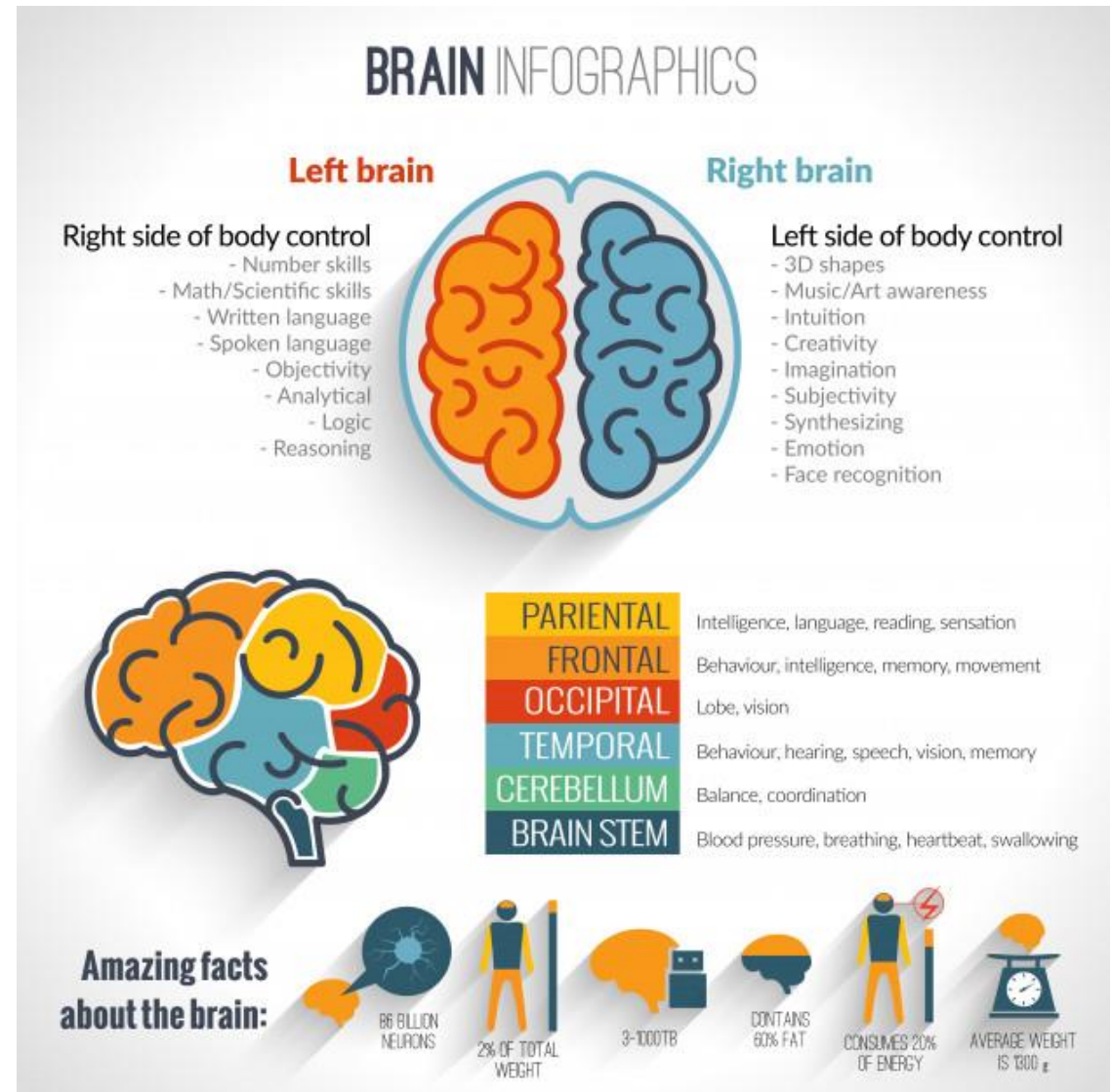




Creativity

- ✓ Mansukhbhai Raghavjibhai Prajapati inventing refrigerator that runs without electricity.
- ✓ Leonardo da Vinci sketching a helicopter, nearly four hundred years before invention of the helicopter.
- ✓ Alexander Graham Bell inventing the first practical telephone.

Creativity – this is the feature that links the above-mentioned inventors. It is a unique human quality that differentiates us from the rest of the animal kingdom¹.



¹ Godenberg J. and Mazursky D., (2002) *Creativity in Product Innovation*. Cambridge: Cambridge University Press



Creativity enhancement techniques



Can you imagine that a few people daydream about the same solution and they can co-operate with each other? How to channel creativity of a team in the same direction in order to accomplish a desired goal?

We will present you some techniques which will support you to accelerate the creativity of people.



Talking about the **team** we shall think about two or more individuals, interacting and interdependent, with who you are going to work in order to achieve a desired goal.

This group can be either formal or informal. Your employees or co-workers creates a formal group. When you meet with your friends and colleagues for coffee and talk about new ideas, this is for sure an informal group.



Creativity enhancement techniques can be very supportive in the following phases of frugal **innovation process**:



1. Need
2. Idea
3. Project
4. Decision
5. Implementation

The need can mean a problem that you want to solve, or your determination to change something or your willingness to help others. The examples of frugal innovations presented in the previous modules pointed out various needs:

- to help people in India store food in the area with no electricity,
- to redistribute a surplus food in order not to waste it,
- to provide access eye treatment to people who leave far away from eye clinics,
- to reduce waste collection costs,
- to support education in programming.

Some problems can be easily solved.

Examples of simple improvements of products

E



Procter&Gamble developed a new toothpaste tube noticing the problem of old paste getting caked on the thread. *"We're going to save marriages with this product"* said the executive when he announced the idea of resigning from the screw threads entirely.

But when they observed people who still had the habit of crew on and off instead of using the pop-off and pop-on caps, they decided to introduced the hybrid solution: combination of one-twist cap.

Interesting – look at your toothpaste tube. How does it open?

* Kelly T., Littman J. (2001) *Art of Innovation*, Profile Books,

PROBLEM

Toothpaste baked on the thread

PROBLEM

Difficult access to water

The water bottle used by bike racers often gets covered with dirt or mud from the trail. It happens also with the nozzle, which shouldn't be covered with any cap – racers need to have fast and easy access to drink while riding.

The solution was found in nature. Humans heart has the tricuspid heart valve, which allows blood to flow only in one direction.

This was used in water bottles – when you squeeze it, the water can be easily drunk by racers. And dirt would not get into the bottle.

Source: Kelly T., Littman J. (2001) *Art of Innovation*, Profile Books,



Brainstorming helps to find the ideas.



Brainstorming is a technique enabling to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its members.

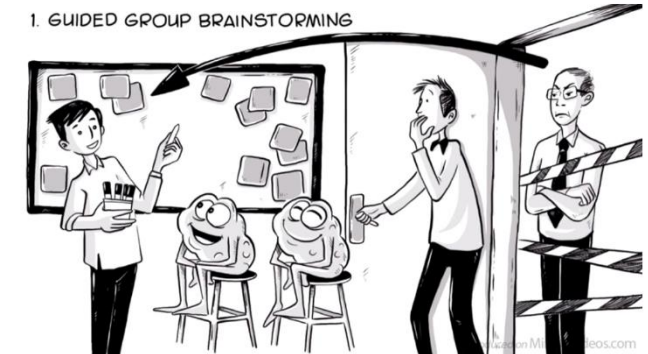
The most popular technique to generate creative ideas is brainstorming session.

Rules of successful brainstorming includes:

- ✓ Criticism should be abolished (participants are not allowed to express any judgement).
- ✓ The wilder idea the better (regardless how unrealistic an idea may seem)
- ✓ Quantity of ideas leads to quality (the more ideas the better)
- ✓ Managers, CEOs, Presidents are not allowed in the room where brainstorming is conducted

Useful guidelines:

- ✓ Warm-up and homework (participants have to be prepared)
- ✓ Define the problem properly
- ✓ Suspend judgement
- ✓ Cross-pollinate ideas²



<https://www.youtube.com/watch?v=YXZamW4-Ysk>

Do you know that...

Employees join teams because:

- They feel secure by joining the group (they feel stronger).
- They get strong sense of self-worth (self-esteem).
- They can achieve more with the team (power).
- They can achieve personal and organizational goals by participating in a team.

Robbins S. et al (1994) *Organisational Behaviours*. Sydney: Prentice Hall in Australia

² Dawson P., Andriopoulos C., (2014) *Managing Change, Creativity and Innovation*, Sage Publications

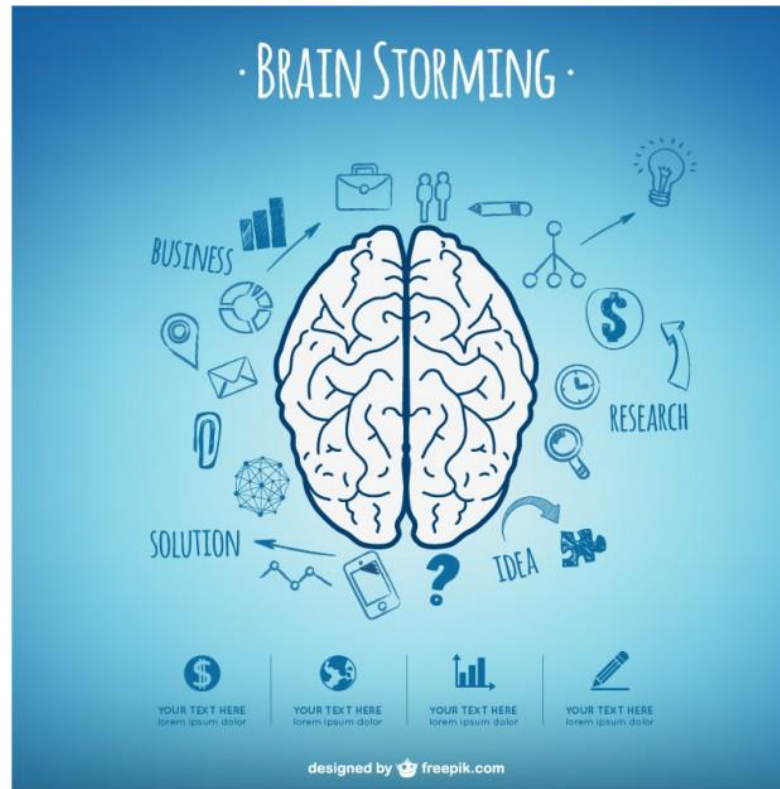
Advantages

- The generation of hundreds of ideas
- Support the organizational memory
- Impressing clients
- Improved morale
- Get better understanding of each other
- Enjoyment
- Personal growth and well-being
- Think-up improvements
- Relatively inexpensive

vs.

Disadvantages

- The generation of ideas without screening them
- It may not be the answer to your problems



Source Dawson P., Andriopoulos C., (2014) *Managing Change, Creativity and Innovation*, Saga Publications

Other techniques used in team working:

Brainwriting: emphasize the silent generation of ideas in writing in contrary to talking session. Usually after a regular brainstorming session participants are requested to start writing down their ideas. Two types of brainwriting can be distinguished:

- Individual poolwriting: Each participant writes ideas on a piece of paper and place it in the center of the table. Then each team member draws one of the sheets and adds more ideas.
- Brainwalking: ideas are written down on pieces of paper which are posted on the walls. Each participant walks around the room and adds their ideas in silent.

Nominal Group Technique: ideas are written down silently by each team member. Then ideas are presented and recorded e.g. on a whiteboard. Then the whole team discuss all idea trying to prioritize them³.



https://www.youtube.com/watch?v=bQF5Yrd_QTI

Steps for Using the Nominal Group Technique

- Step 1: Present goals.
- Step 2: Generate alternatives.
- Step 3: Record the alternatives.
- Step 4: Consolidate the alternatives.
- Step 5: Rank the alternatives.

Nominal Group Technique: Tally votes.

³ Dawson P., Andriopoulos C., (2014) *Managing Change, Creativity and Innovation*, Saga Publications



Mark Zuckerberg On Driving Employee Creativity



<https://www.youtube.com/watch?v=VISQWDh9lAM>



Creative Work Environment



If you run a company, please remember, that human resources are very valuable source of innovations.

Think about assuring your employees Creative Work Environment⁴, which means that you should

1. Celebrate people and their work

Your employee would like you to appreciate their work

2. Reflect employees' interests

Employees are different. Their interests can be valuable for new ideas.

3. Encourage collaboration

When people can meet and talk, they can come up with many interesting ideas. Organise a space for such meetings.

4. Respect communication

Be clear about what you want to achieve and communicate with people constantly.

5. Set a tone of risk-taking

Don't be afraid of taking a smart risk by your employees. It can be your success.

6. Foster innovation

Inspiration for new innovative ideas are everywhere, sometimes outside your office. Don't be afraid if your employees look for inspirations in various places.

7. Promote learning and teaching

Allow your employees to attend various trainings and workshop. This is new knowledge for your organisation

⁴ Source: <https://www.roberthalf.com/blog/management-tips/7-elements-of-a-highly-creative-work-environment>

Sources of frugal innovation

Seven areas of opportunity for innovation”

1. Unexpected successes and failures
2. Incongruities between reality and the imagination about it
3. Process needs
4. Industry and market change
5. Demographic changes
6. Changes in perception and meaning
7. New knowledge

Source: Drucker P. (1985) *Innovation and Entrepreneurship*, Routledge

Sources of innovations

1. Consumers
2. Existing enterprises
3. Distribution channels
4. Government decisions
5. Research and development

Source: Hisrich R.H., Peters M.P. and Shepherd D.A., (2010), *Entrepreneurship* 8th edition by, Mc Graw Hill Irwin,

Inspirations are around you

Look around you. Everywhere you notice a need of change, there can be an opportunity for you to introduce frugal innovations.

As N. Radiou (video presented in Module 1) said, for frugal innovators **“street is the lab”**.

People on the street, you friends, your family, your colleagues – they all have some expectations or struggle with some problems. They can inspire you for developing frugal innovations.

Do not worry about obstacles.

Constraints are no longer disadvantage! They can inspire you.



Watch what inspires inventors in India



16

<https://www.youtube.com/watch?v=jJ-tTrZPvag>

Design thinking

Very popular approach of creative problem solving comes from the designers' world. Design thinking is the method based on strategies used by designers during the process of designing. It is not as systematic as typical process of problem solving. It reflects the iterative and parallel nature of design.

It mixes a **heart, head and hand** approach, which means that the problem solving should start with emotions and needs, then transfer into a process of ideation, to be finished with the tangible creation by hand.

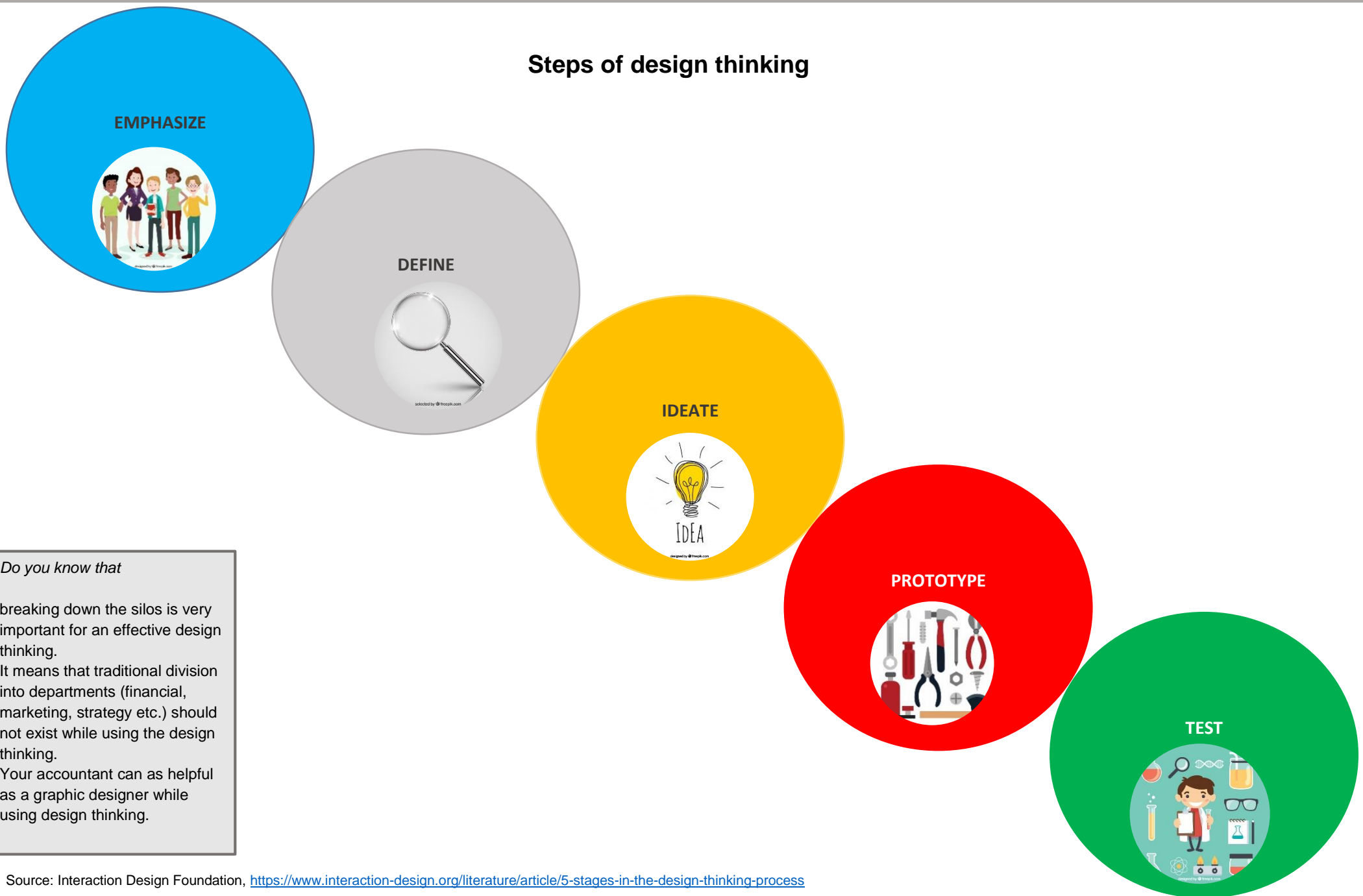


Watch about desing thinking



<https://www.youtube.com/watch?v=a7sEoEvT8I8>

Steps of design thinking



Do you know that

breaking down the silos is very important for an effective design thinking.

It means that traditional division into departments (financial, marketing, strategy etc.) should not exist while using the design thinking.

Your accountant can as helpful as a graphic designer while using design thinking.

Source: Interaction Design Foundation, <https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process>



Research as an inspiration

One can say that it is too obvious that marketing research can bring valuable knowledge and show directions for new innovative solutions. But they are also very expensive which is in contrast to frugal solutions. What instead?

You can conduct your own research, which can cost you nothing or very little money comparing to marketing research conducted on representative sample.

Type of frugal research	How to conduct research?	What is needed	Cost	Examples of sources
Desk research	Analyze: websites, newspapers, blogs, magazines, books, analysis, research papers, data bases, reports in order to gain knowledge about trends, new solutions, market needs.	Internet connection, computer, books, newspapers, magazines or subscription to on-line versions of newspapers and magazines	Related to Internet fee, subscription fee. <u>How to reduce costs:</u> Use public libraries and get magazines, books and access to some database for free.	Business Innovation Observatory Eurostat World Bank OECD
Quantitative research	Collect information based on the answers from a questionnaire. The more respondents the better. Survey should be anonymous.	A computer and a printer. or A computer and Internet connection to create on-line survey.	Paper and tonner to print questionnaires. <u>How to reduce costs:</u> Use on-line tools enabling collecting and analyzing of data.	Survey Monkey GoogleForms
Qualitative research	Collect information based on interviews (previously prepared questions).	Recorder if you conduct long interviews or high amount of interview.	Recorder How to reduce costs? Use you mobile phone app.	----
Observation	Observe people on the streets, at work, your family, friends, colleagues from work, neighbors.	Your curiosity	No cost	----



Sources

Are you interested to learn more about creative problem solving?

We recommend you to use the following sources:

Websites:

<https://www.interaction-design.org/>

<https://www.ideo.com/pages/design-thinking>

<https://www.forbes.com/sites/reuvencohen/2014/03/31/design-thinking-a-unified-framework-for-innovation/#68ae7b868c11>

<https://www.roberthalf.com/blog/management-tips/7-elements-of-a-highly-creative-work-environment>

<https://www.nesta.org.uk/blog/the-importance-of-design-thinking/>

Videos



Design Thinking - Tim Brown, CEO and President of IDEO

<https://www.youtube.com/watch?v=U-hzefHdAMk>

The Design Thinking Process https://www.youtube.com/watch?v=r0VX-aU_T8

How the Environment Impacts Creative Thinking

<https://www.youtube.com/watch?v=pgvMJS1zSsE>

Ben Chestnut: Creating an Environment for Creativity and Empowerment

<https://www.youtube.com/watch?v=h8U8dSwi7PQ>

Other sources:

Osterwalder A., Pigneur Y.. (2010) *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*, Wiley

Harvard Business Review on Business Model Innovation (Harvard Business Review Paperback Series), Harvard Business Review School Press 2010

Dawson P., Andriopoulos C., (2014) *Managing Change, Creativity and Innovation*, Saga Publications

Drucker P. (1985) *Innovation and Entrepreneurship*, Routledge

Hisrich R.H., Peters M.P. and Shepherd D.A., (2010), *Entrepreneurship* 8th edition by, Mc Graw Hill Irwin,

Kelly T., Littman J. (2001) *Art of Innovation*, Profile Books



Ready for a quick TEST?



You can quickly verify the knowledge you gained after attending this module.

Choose right answers.

1. Creativity

- a. can be boosted only in advanced laboratories
- b. is an innate feature of human nature
- c. is not related to daydreaming

2. Constraints should be perceived as

- a. inspirations for frugal innovations
- b. obstacles making our ideas impossible to implement
- c. factors to be solved only by big corporations

3. Design thinking

- a. is used only in factories
- b. is the way of solving problems using designers' methods
- c. does not require involving people representing various occupations



Ready for a quick TEST?

T

You can quickly verify the knowledge you gained after attending this module.

Choose right answers.

4. The first step of creative thinking is:

- a. planning
- b. fantasy
- c. controlling

5. Innovation process can be described as:

- a. Planning and implementing
- b. Need, decision and realization
- c. Need, idea, project, decision and implementation.

6. During the brainstorming

- a. The narrower idea the better
- b. Criticism should be abolished
- c. Managers, CEOs, Presidents should be in the room to observe their employees



Ready for a quick TEST?



You can quickly verify the knowledge you gained after attending this module.

Choose right answers.

7. Brainwriting

- a. Means writing creative essays
- b. Distinguishes Individual poolwriting and brainwalking
- c. Is a creative test

8. Steps of design thinking includes:

- a. Plan, decision, implementation
- b. Emphasize, define, ideate, prototype, test
- c. Need, idea, project, decision and implementation

9. Frugal research can encompasses

- a. Usage of free on-line tools like GooleFomrs
- b. Only big market research
- c. Observation of the street



Activity

Talk to elder members of your family (grandparents, parents). They are maybe 60+, 70+ or even 80+. Ask them about obstacles which they have to face on the daily basis. Prepare questions before the interview. Try to be empathic and understand their limitations.

What are the conclusions? Have you noticed any common platform of problems?

You can confront it asking other elder people from your surrounding (neighbors, friends' parents).

Do they have similar problems?

Do you have any idea how to solve it? Maybe that is an idea for an innovation.

