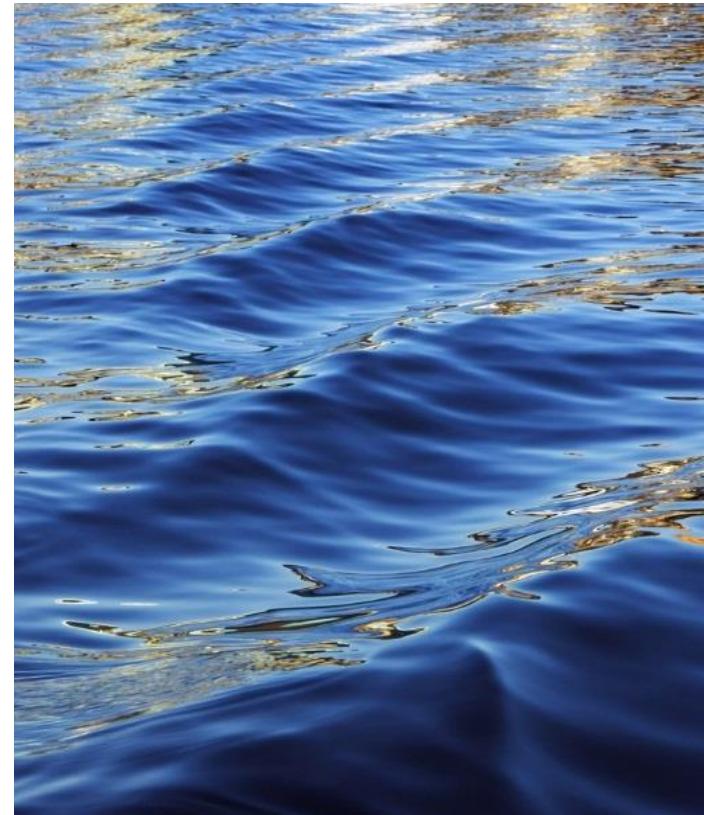




Ideation Methods

ET-3153



Outcomes

At the end of this lecture, you will be able to:

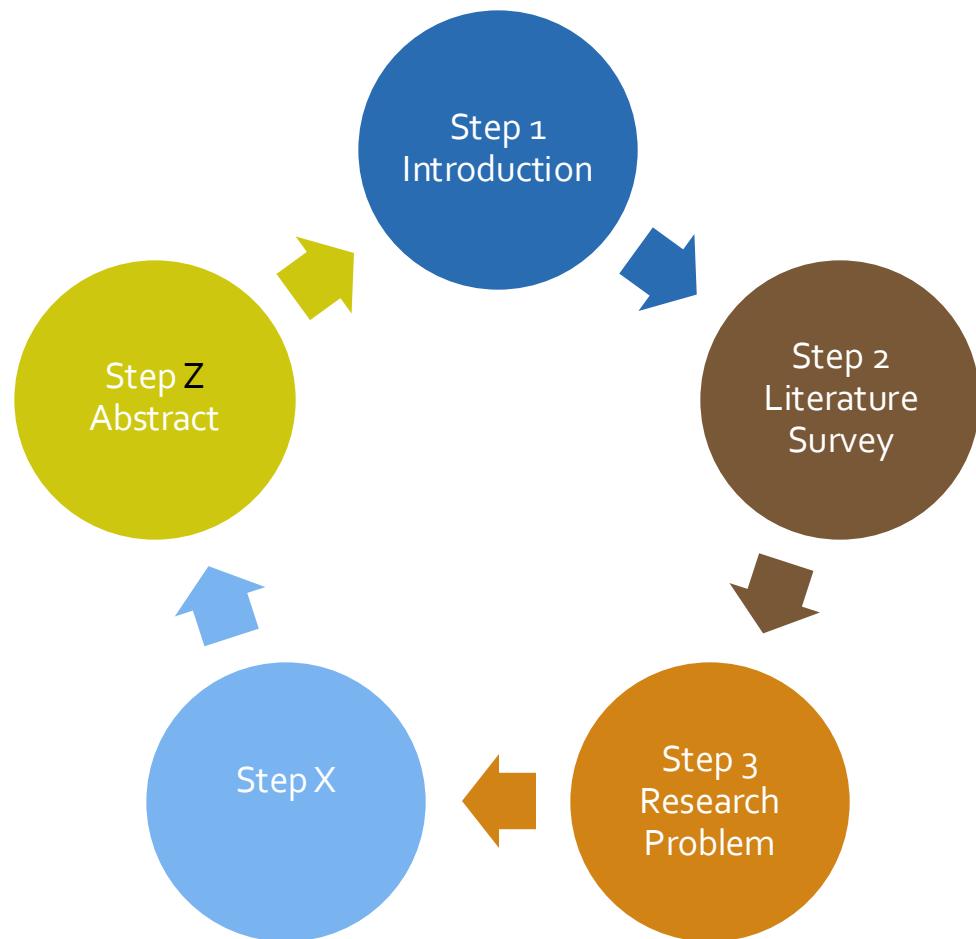
- Ideate with *6-3-5 Brainwriting Method*.
- Build on ideas of colleagues.
- Introduced to *Function Analysis*.
- Generate ideas in an Analytical and Systematic manner using *Morphological Method* to improve your design.
- Validate your design using *Concept Fan Method*.
- Introduced to *Mind Mapping*.
- Introduced to useful *Online Tools*.

Module Descriptor

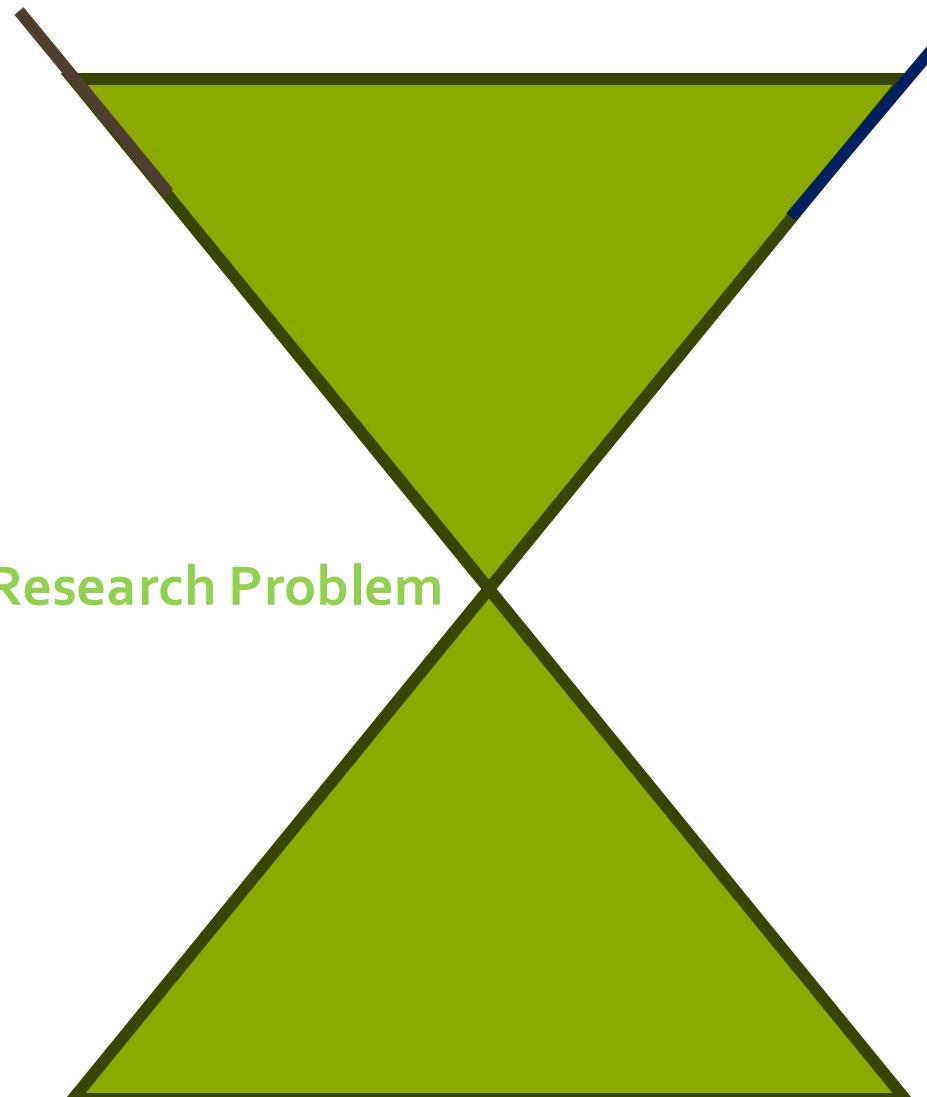
Research

- A **systematic inquiry**, that helps make the sense of the world.

Contents



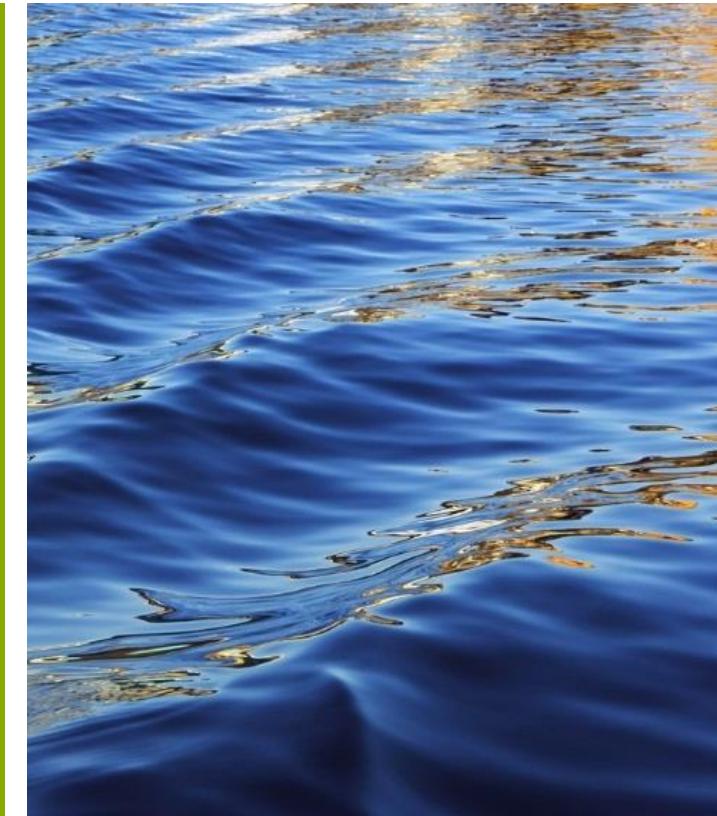
Research Process





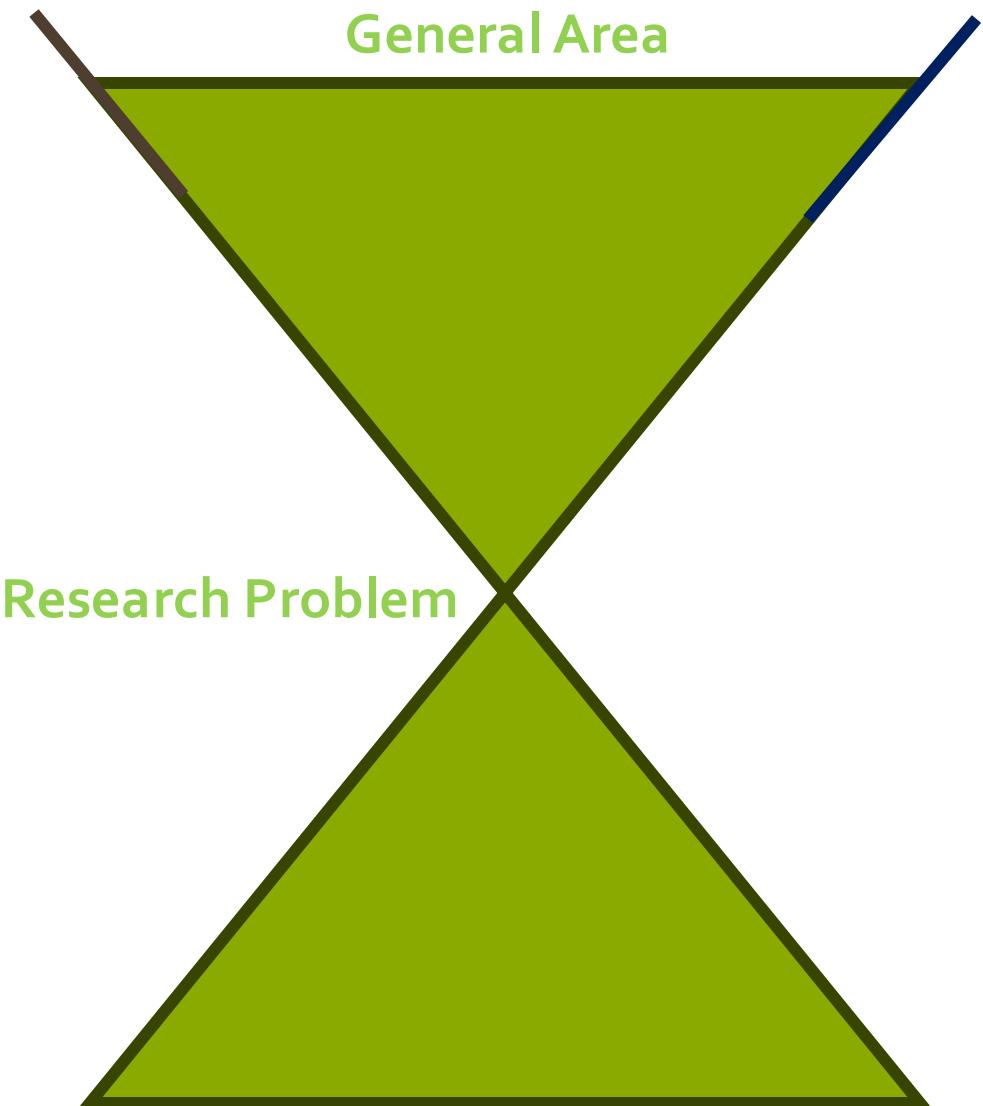
General area

Specific Area



General Area

- Favorite
- Inspiring
- Intriguing
- Curious
- Burning
- National level
- Global level

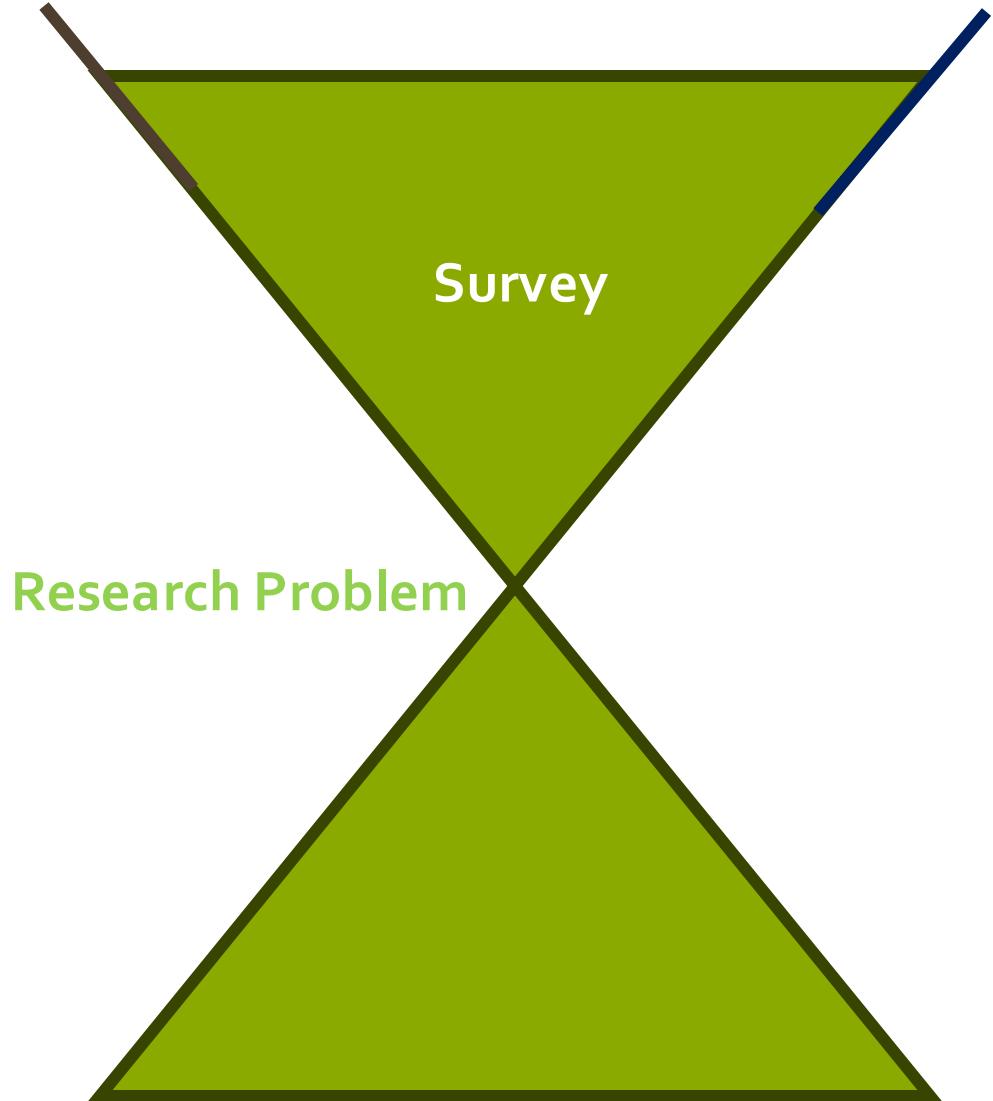
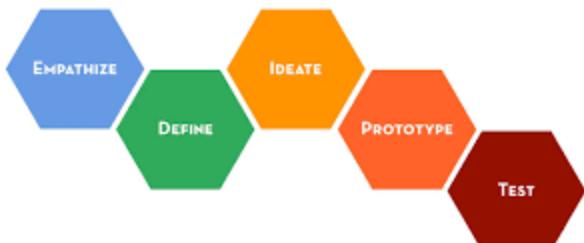




Specific Problem

- Literature Survey
- Patent Search
- Product Survey
- Professional Problem

- Design Thinking



6-3-5-Method

6-3-5-Method

- Six people each receive a copy of the template and write three ideas in the first row. Then the sheet is passed clockwise, and the next person builds on the previous person's ideas.
- This process is repeated five times. If you don't have any ideas, leave the cell blank.
- You have three minutes per round. After 15 minutes, you then have six tables with 18 ideas each = 108 ideas.
- Note: The method also works in a 4-3-3 or 3-3-2 model.

6-3-5-Method

ET3153

Individual Design Project

6-3-5 Method Canvas

Problem:

	Solution/Idea 1	Solution/Idea 2	Solution/Idea 3
Student 1			
Student 2			
Student 3			
Student 4			
Student 5			
Student 6			

6-3-5-Method

Problem Statement:

	Idea #1	Idea #2	Idea #3
Person A	Person A writes an idea here...	...and another idea here	... and another here.
Person B	Person B writes their idea here, perhaps a new idea...	... or one which builds from an earlier idea	... or a combination of both ideas
Person C	Person C contributes here, adding their ideas in this now...	... which build on any ideas on this page or may be entirely new

Functional Analysis - A Brief Introduction

Functional Analysis

- The Functional Analysis allows:
 - identifying the **physical components**, the so-called building blocks, which constitute the future product, and
 - how they are **interrelated to build up the functional architecture** of the future product.

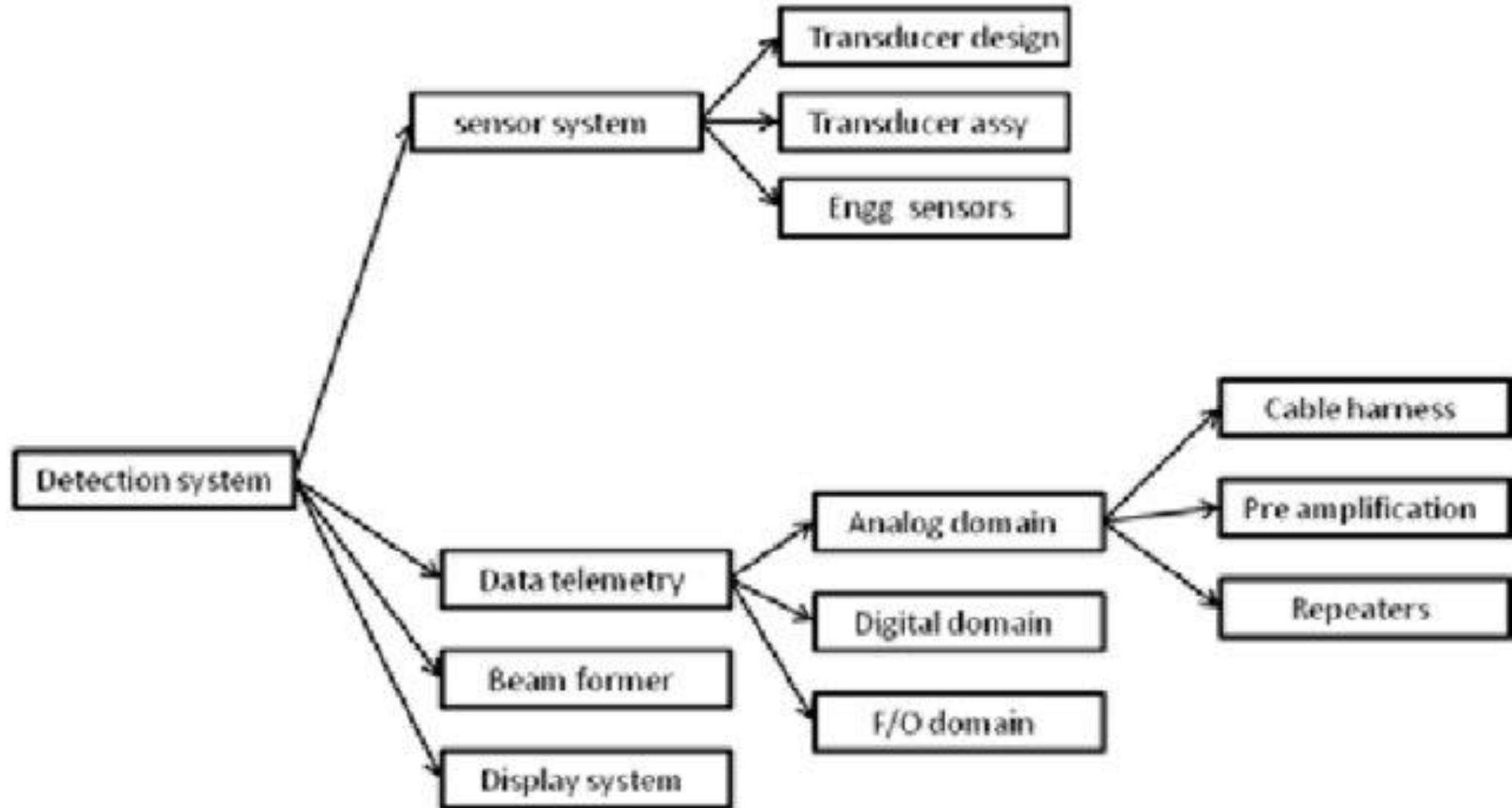
Functional Analysis

- Functional Analysis as the systematic process of,
 - identifying,
 - describing, and
 - relating the functions a system has to be able to perform,
 - in order to be successful,
 - but does not consider it as a design tool to address how functions will be performed,
 - i.e. to map functions to physical components.

Functional Analysis

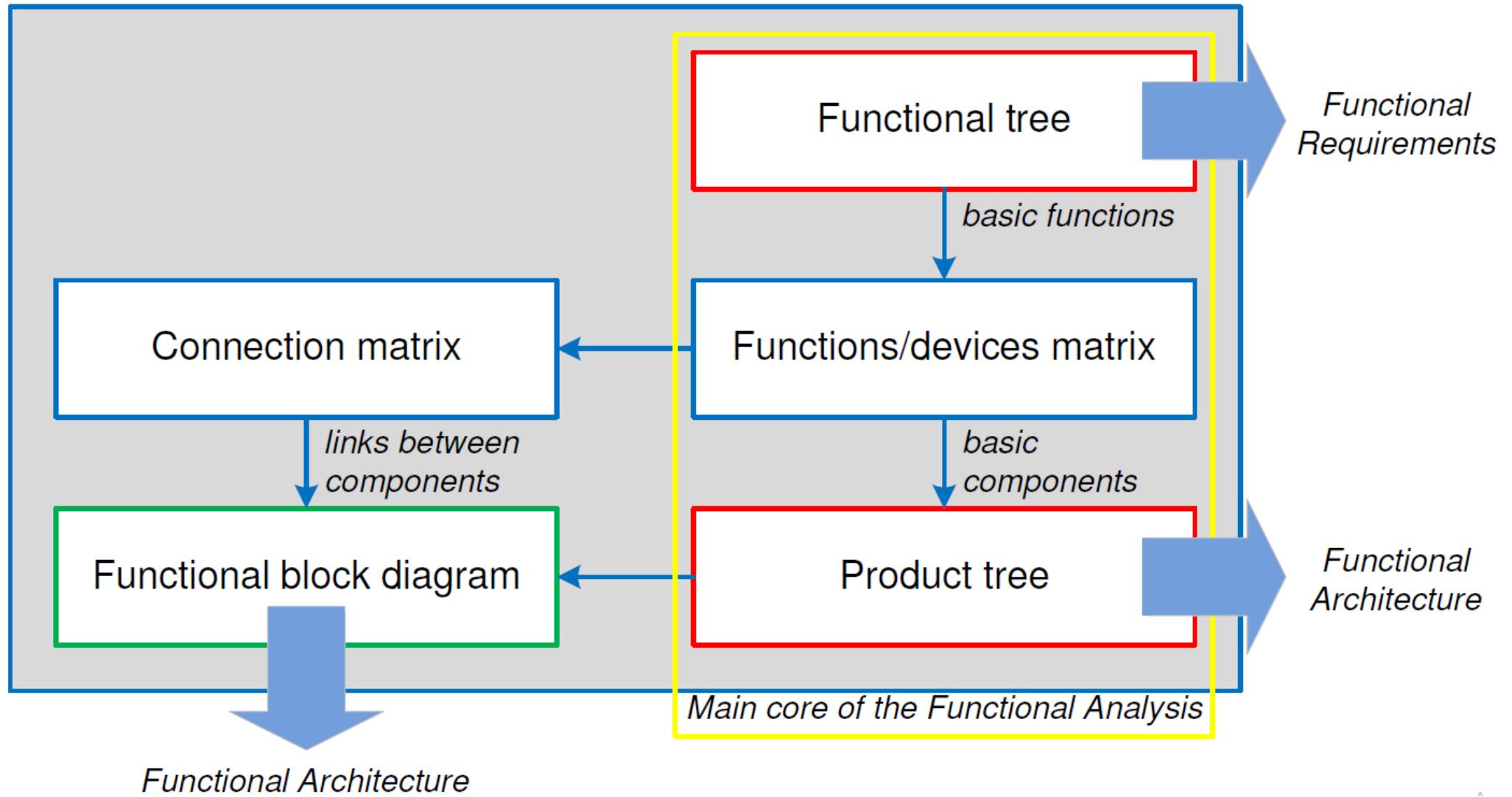
- In conceptual design Functional Analysis can be applied at different levels:
 - **subsystem** level (like the avionic subsystem of an aircraft, consisting of various pieces of equipment),
 - **system** (like a satellite consisting of various systems) and
 - **system of systems** level (like a Moon base, consisting of various systems).
- According to the considered level, the physical components or building blocks, which make up the future product, are therefore equipment, subsystems or systems.

Functional Analysis - An Example

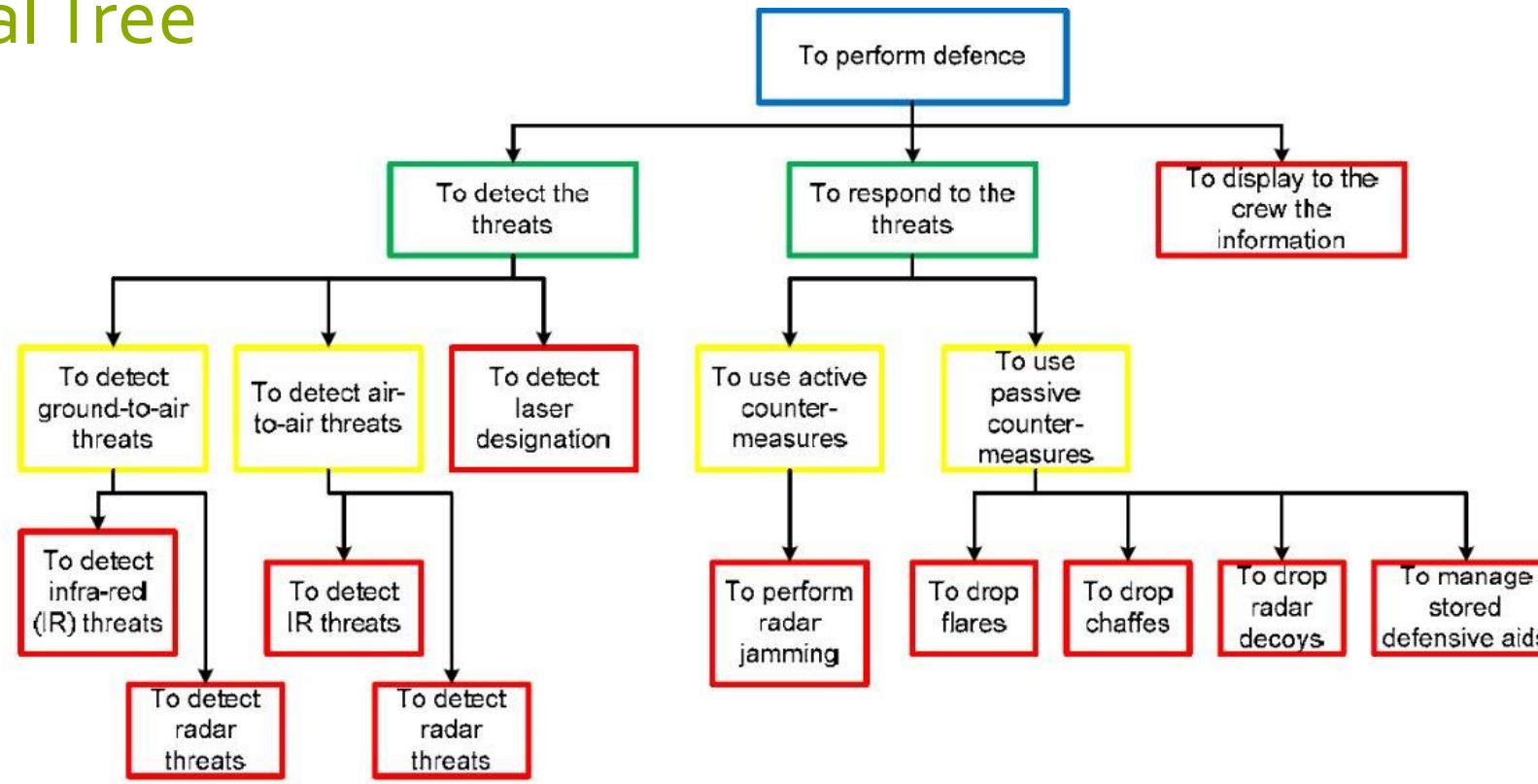


Kumar, K. & Saravanakumar, M. & Joseph, J. & Ramanathan, Hareesh. (2016). Generative Model for Conceptual Design of Defence Equipment. Defence Science Journal. 66. 81. 10.14429/dsj.66.9105.

Functional Analysis - Work Flow



Functional Tree



- The functional tree allows **splitting the higher level functions**, which stem from the mission objectives/top level system requirements, **into lower level functions** and eventually it allows **identifying the basic functions** that have to be performed by the future product.
- Through the functional view we look at a new product asking ourselves "**what does it do?**"
- Each function shall be expressed by means of **verb** and **noun**.
- In case functions **cannot be decomposed any further**, they shall be reported at the bottom of the tree as basic functions.

Functions/ Devices Matrix

- The functions components matrix is therefore used to map functions to physical components.
- Built simply by matching the bottom of the functional tree, consisting of all basic functions, with one column of components able to perform those functions.
- Starting from the column containing the first basic function under consideration, the component able to perform that function can be defined by simply answering the question: "which component is able to perform this function?"
- The same process applies to all basic functions. Starting from the analysis of the first basic function, new components progressively fill in the column of devices. Eventually all basic components are determined.
- With the functions/devices matrix we now know the basic components or building blocks, which constitute the future product.
- By simply grouping together the basic components, the product or physical tree of the new product can be generated.

	Basic functions								
Basic devices	To detect infra-red (IR) threats	To detect radar threats	To detect laser aiming	To perform radar jamming	To drop flares	To drop chaff	To drop radar decoys	To manage stored defensive aids	To display to the crew the information
	X								
	X								
		X							
			X						
				X					
					X		X	X	
						X	X		X
								X	
									X

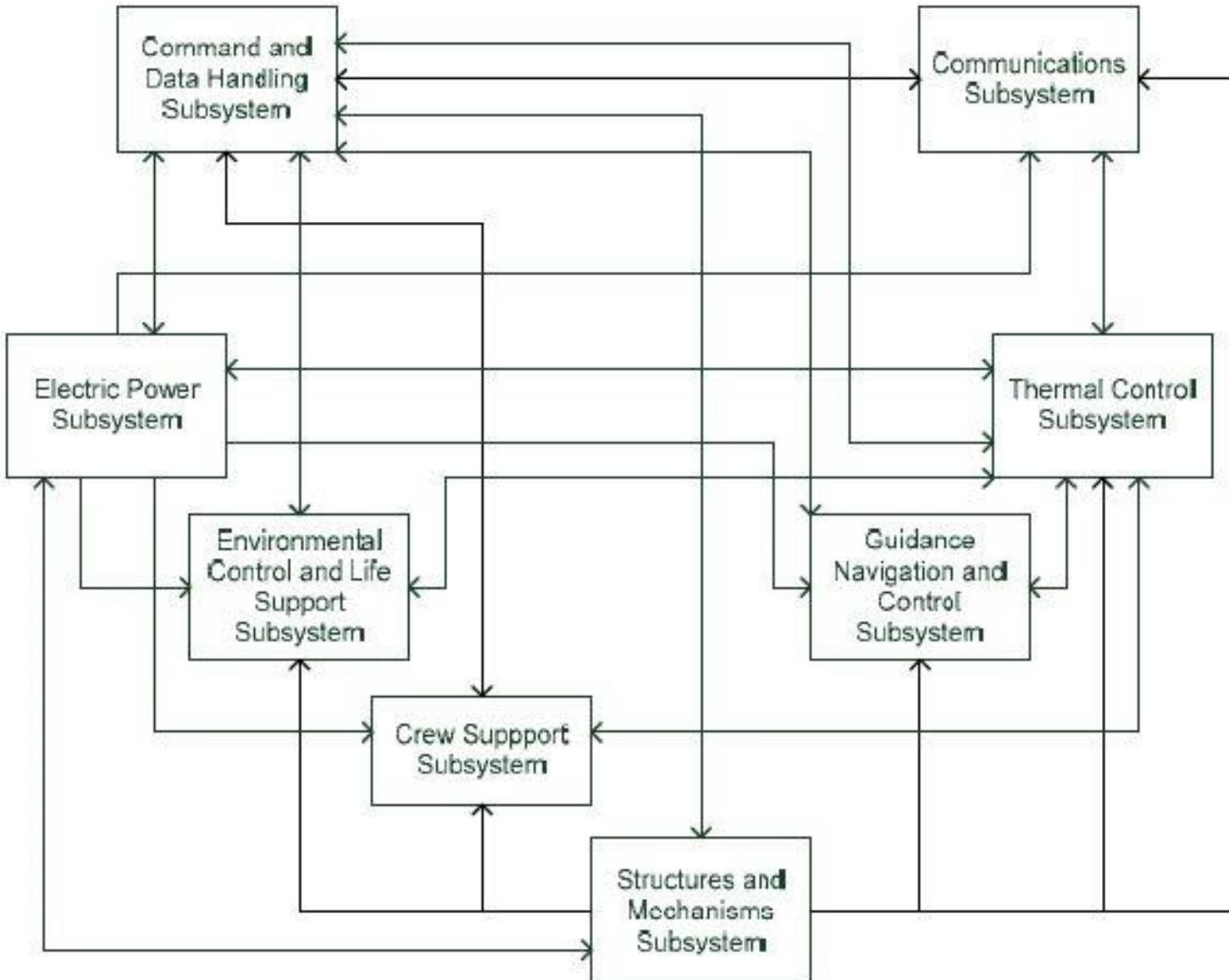
Connection Matrix

- Once the basic components have been identified, the **links between the various components within the system** can be determined.
 - Starting from the first row and then proceeding down the column of basic devices, **all components have to be analyzed**, in order to **understand whether or not there are connections between them**.
 - In case two components have a connection because, for instance, they are requested to exchange information, then the box where the two components intersects must be ticked.

	Missile warning receiver	Infra Red (IR) warning system	Radar warning receiver	Laser warning system	Jammer decoy dispenser	Jamming system	Chaff/flares dispenser	Store management system	Multi Function Display (MFD)
Basic devices	X	X	X	X	X	X	X	X	X
Missile warning receiver									
Infra Red (IR) warning system									
Radar warning receiver									
Laser warning system			X					X	
Jammer decoy dispenser				X		X		X	X
Jamming system					X		X		X
Chaff/flares dispenser						X		X	
Store management system			X						
Multi Function Display (MFD)				X					

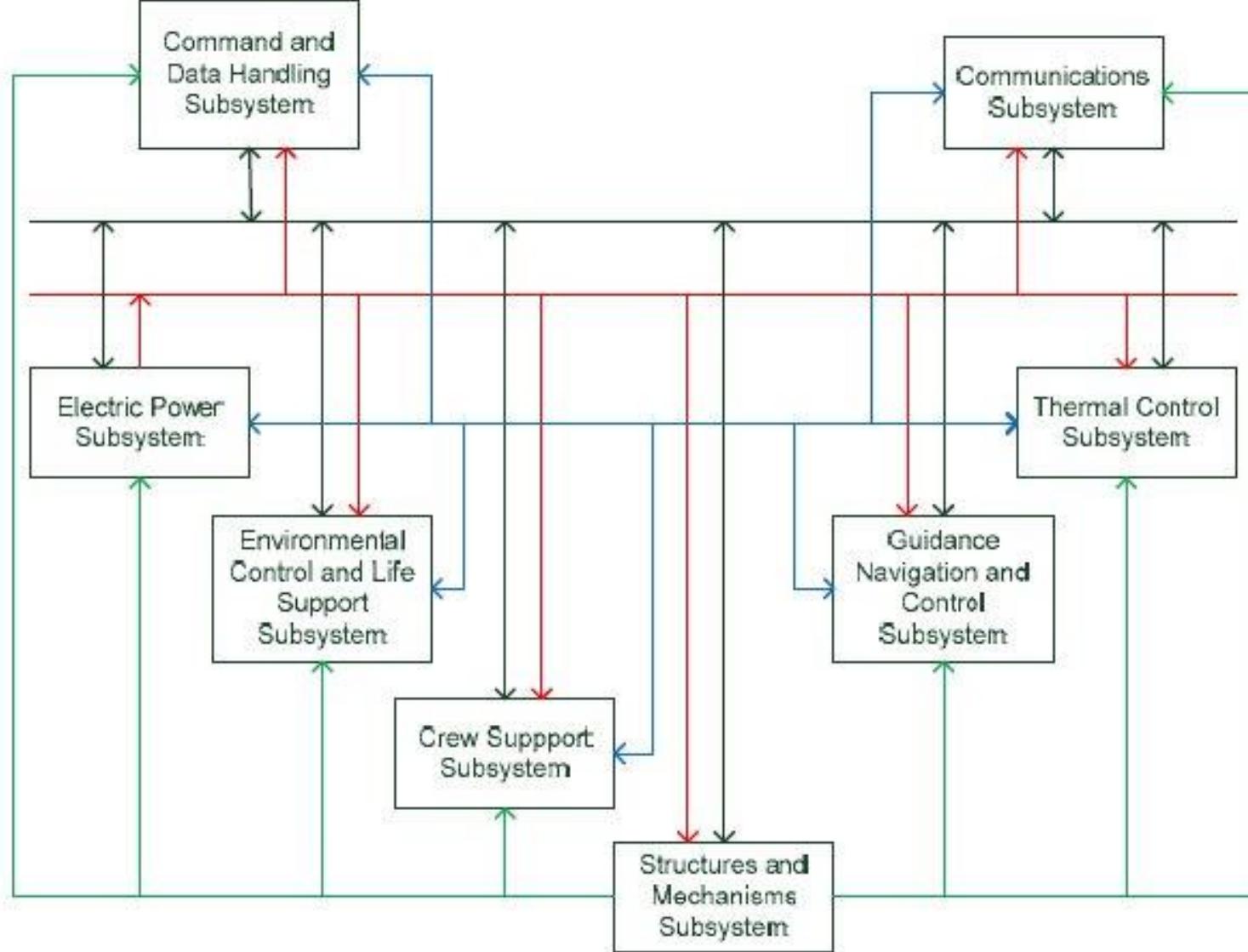
Functional Block Diagram

- In the functional block diagram, where building blocks, that need to be **connected**, are linked through **point-to-point** connections.
- These connections are **arrows and not just simple lines**, the functional block diagram provides the reader with additional information, if compared to the connection matrix, as it **highlights not merely connections but where these connections are pointing to**, i.e. if they are half duplex or full duplex connections.
- Referring to a functional block diagram, it is therefore possible to **understand** that, for instance, **sensors are transmitting information to displays and not viceversa**.



Physical Block Diagram

- Neither the connection matrix, nor the functional block diagram is said about the **nature of the connections**, which may be, for instance, power, signal or fluid lines.
- This information is instead provided by the physical block diagram, which may be considered as **complementary to the functional block diagram**.
- Power line supplies the various building blocks with the necessary power.
- The signal lines, unlike the **functional block diagram where there are point-to-point connections**, in the **physical block diagram** there is a **main bus** to transmit commands and receive feedbacks to/from the various subsystems.
- The building blocks that need an active cooling interface to dissipate heat are connected by a ducting fluid line with the Thermal Control Subsystem.



Morphological Matrix

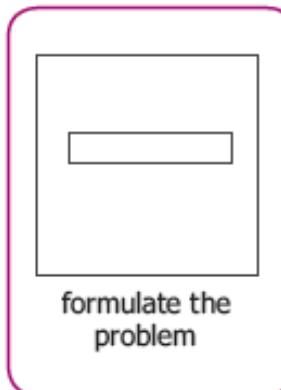
Morphological Matrix

- Functions of the product are taken as a starting point.
- The various functions and subfunctions of a product can be established through a function analysis.
- These solutions will form the components in the morphological chart.
- The morphological method thus yields a matrix of functions and components.
- Possible components are listed on the basis of their functions.
- The components are concrete and specific, specifying the elements that belong to a category (i.e. parameter).

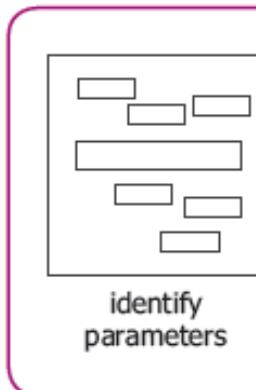
Building a Morphological Matrix

- How to Morphological Chart

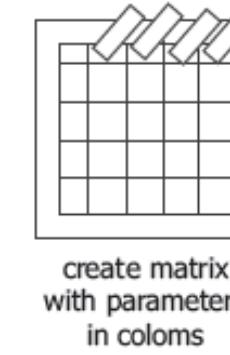
- formulate the problem



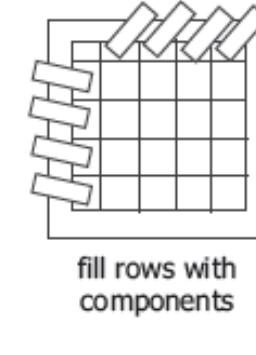
- identify parameters



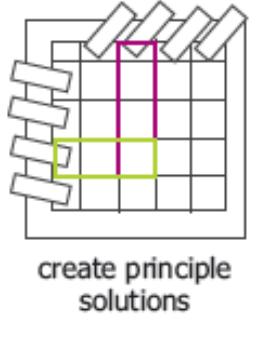
- create matrix with parameters in columns



- fill rows with components



- create principle solutions



- analyse principle solutions



Morphological Matrix

ET3153

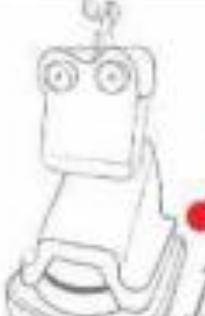
Individual Design Project

Morphological Method Canvas

Equipment:

Function/Attribute	Solution/Method 1	Solution/Method 2	Solution/Method 3

Morpholoaical Matrix

Eyes					
	off	look downwards	flash	animation	turn off
Screen					
	text "follow me!"	route to next stop	direction of next stop	picture of next stop	
Pointer					
	Straight up	towards visitors	in rest	to next location	backwards
Body movement					
	none	little to attract attention	back and forth	sideways back and forth	

Daphne E. Karreman, Geke D. S. Ludden, Vanessa Evers, "Beyond R2D2: Designing Multimodal Interaction Behavior for Robot-specific Morphology," ACM Transactions on Human-Robot Interaction, Vol. 8, Issue.3, Article No.: 18, pp 1–32, <https://doi.org/10.1145/3331144>.

Concept Solution - An Example

Morphological Table		Multiple solutions			
Functions / Tasks	1	2	3	4	
	Auto detection & Alert 1	Use Dunking sonar [7]	Towed array & hull sonar [9]	Use towed array sonar & manoeuvre [8]	Non acoustic methods [6]
	Auto classification 2	Use magnetic signature [7]	Use spectral data for classification [9]	Use satellite data to process movement underwater. [6]	Use Target parameters [8]
	Counter measure 3	Acoustic countermeasure [9]	Silence Own machinery [6]	Use acoustic False target [7]	Use noise makers [8]
	Escape measures 4	Move at flank speeds [8]	Escape geometry to be worked out [9]	Use a second platform to confuse [6]	Silence own ship completely.[5]

Concept solution 2
S1,2-S2,2-S3,1-S4,2

SCAMPER Method

SCAMPER Method Canvas

Equipment/Problem:

Substitute	Combine	Adapt	Modify	Put to Another Use	Eliminate	Reverse
Replace whole/part or concept with something else.	Unite. What? Who? Ideas? Materials?	Adjust to a new purpose? reshape? tune up?	Change the color, sound, motion, form, size. Make it larger, stronger, thicker, higher, longer. Make it smaller, slower.	Change when, where, location, time, or how to use it.	Omit, get rid of, cut out, simplify, weed out.	Change the order, sequence, pattern, layout, plan, scheme, regroup, redistribute.

**S**

Introduce a range of plant-based protein options, catering to the growing demand for vegetarian and vegan alternatives.

C

Introduce the concept of "All-Day Breakfast," providing customers with a flexible dining experience.

A

Implement mobile ordering and payment systems.

M

Make significant modifications to their Happy Meal offerings by reducing portion sizes and incorporating healthier sides like apple slices and milk.

P

Repurpose its drive-thru lanes to serve as designated mobile order pickup points.

E

Phase out less popular menu items.

R

Introduce self-service kiosks at McDonald's locations that allow customers to customize their orders.

SCAMPER



S

Introduce dairy alternatives like almond milk and oat milk, catering to the growing demand for non-dairy options.

C

Combine the concept of loyalty programs with mobile ordering through the Starbucks Rewards program.

A

Enhance its mobile ordering capabilities, allowing customers to place orders in advance, reducing wait times and catering to the evolving work habits of their clientele.

M

Modify its menu offerings to introduce seasonal and limited-time beverages, creating a sense of urgency and excitement among customers.

P

Repurpose its physical space to create a welcoming environment for remote work and meetings, transforming its locations into versatile spaces for both work and leisure.

E

Discontinue the use of plastic straws in favor of more sustainable alternatives.

R

Rearrange its store layout to facilitate mobile order pickup stations, improving order fulfillment times and enhanced the overall customer experience.



S

Explore sustainable materials like recycled polyester and sustainable cotton as a substitute for traditional synthetic fabrics.

C

Combine fashion and technology with their collaboration with Parley for the Oceans, resulting in a range of footwear and apparel made from recycled ocean plastic.

A

Expand their casual footwear lines, allowing them to tap into the broader trend of comfortable, versatile fashion for everyday wear.

M

Modify their shoe designs to incorporate advanced cushioning and support technologies, addressing the evolving needs of athletes and fitness enthusiasts.

P

Repurpose their manufacturing waste by incorporating it into the production of new products, reducing waste and demonstrating a commitment to circular economy principles.

E

Eliminate hazardous chemicals from their production processes, contributing to safer and more sustainable manufacturing practices.

R

Rearrange their supply chain to prioritize local production and reduce carbon emissions associated with transportation.

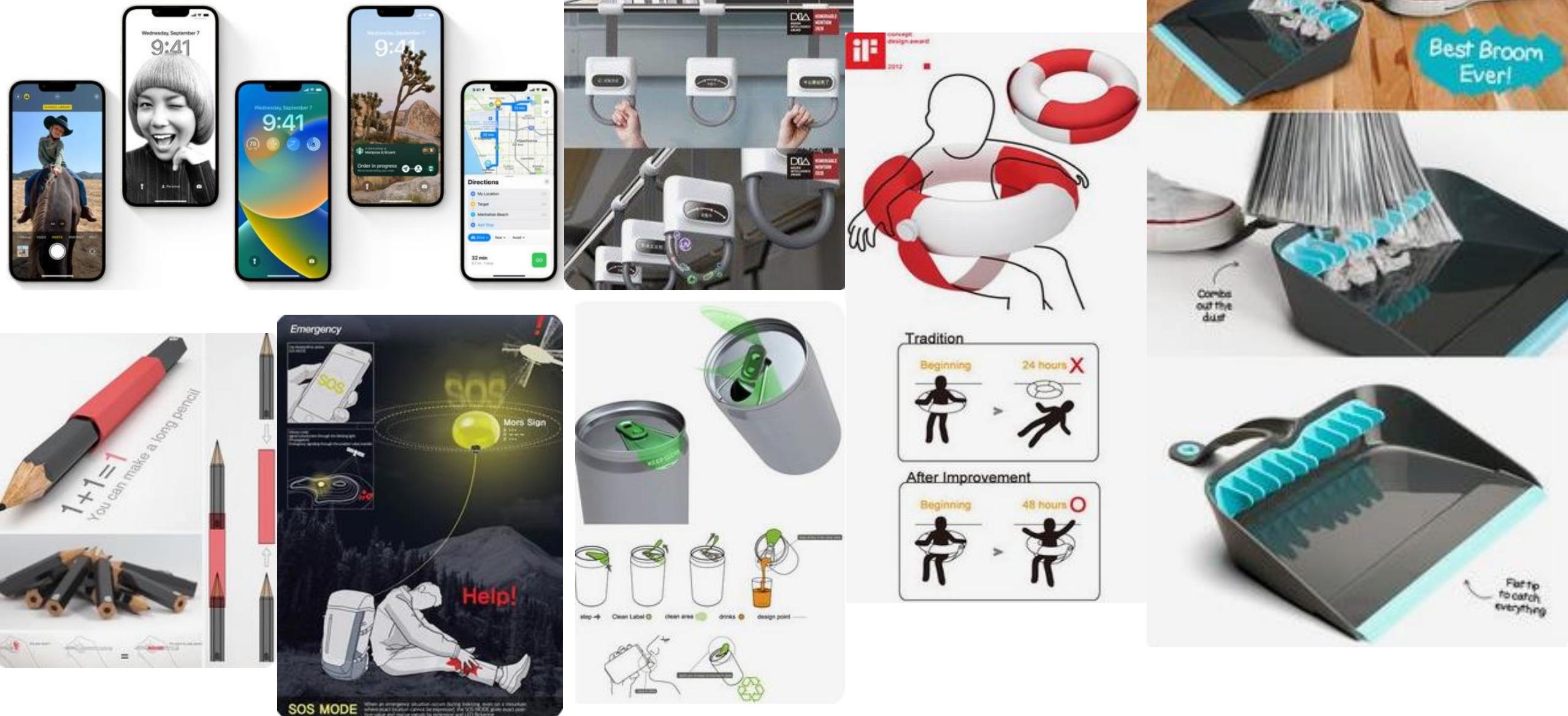
Substitute



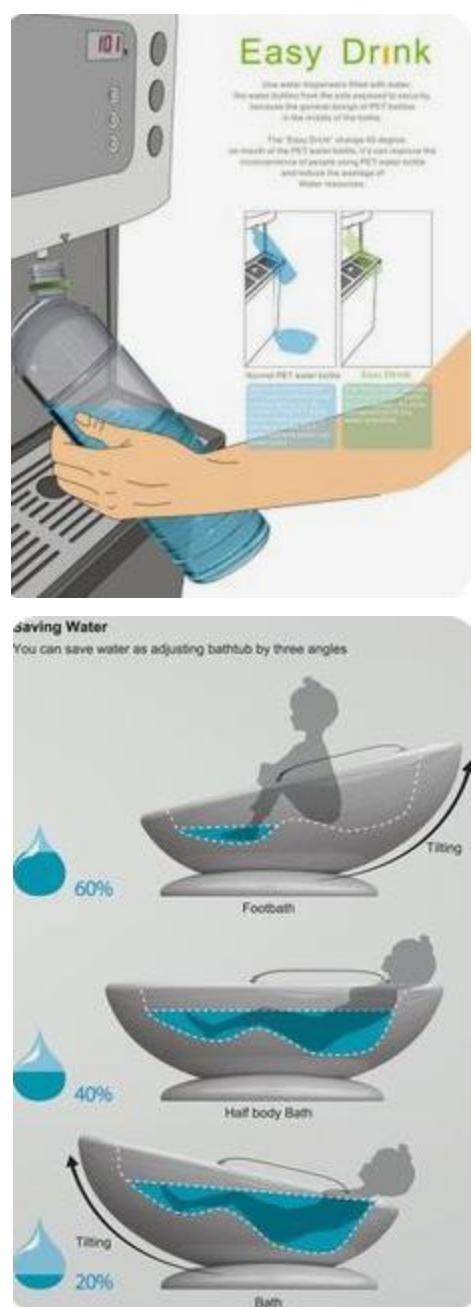
FJÄLLBERGET chair by The IKEA design



Combine



Adapt



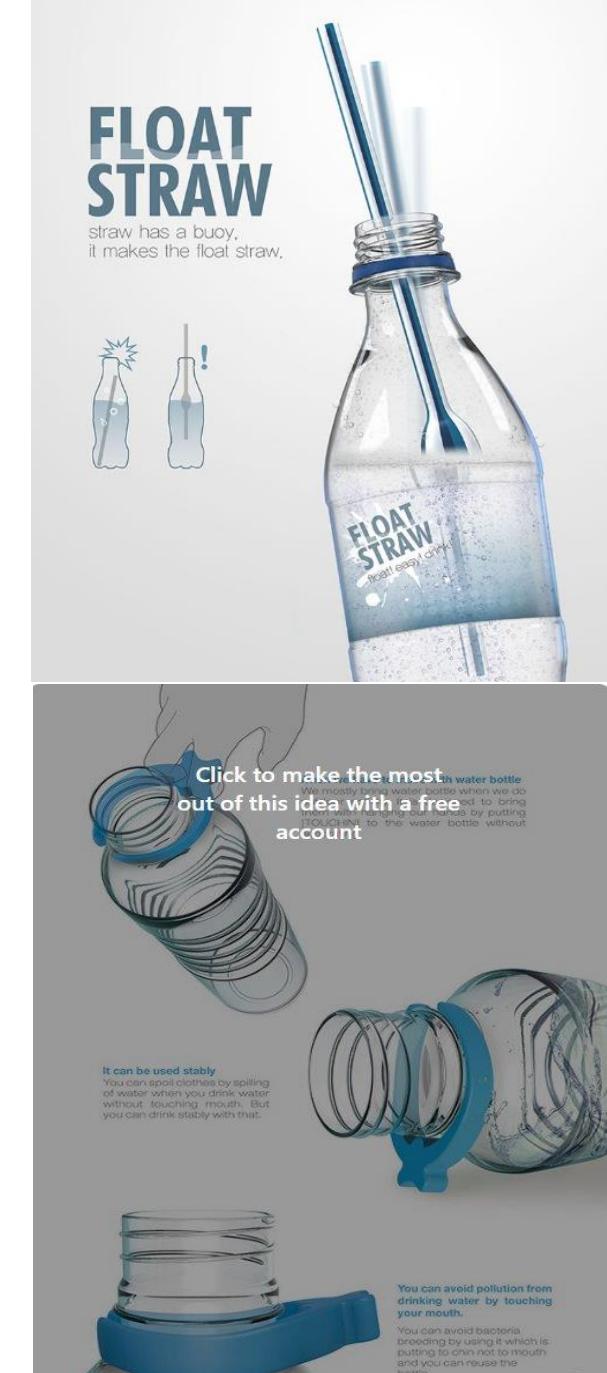


Source: YouTube/ Whistle Design Group

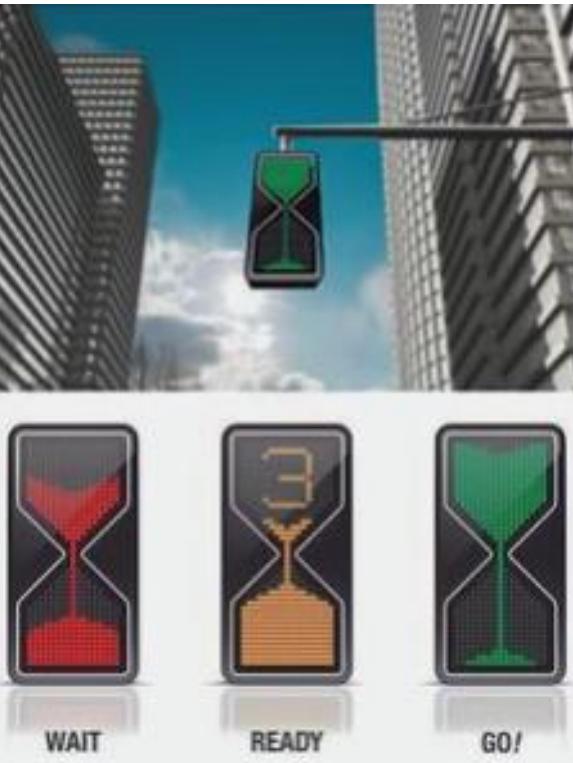
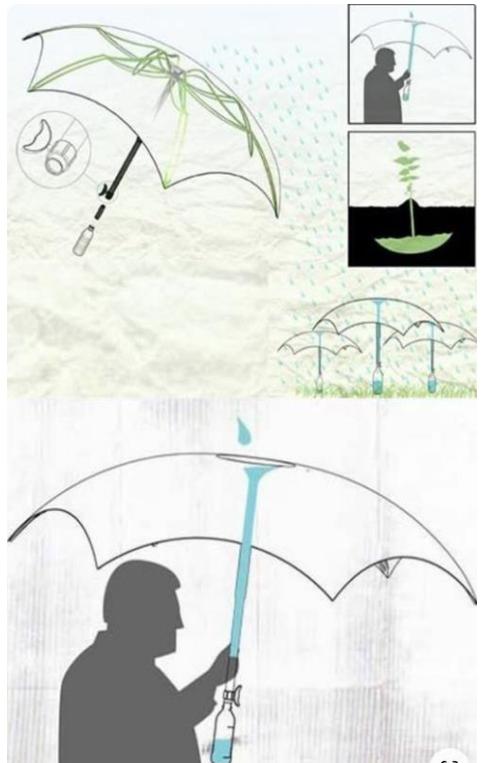
BU_T

© UdayaDampage 08/2018

Modify



Put to Another Use



Eliminate

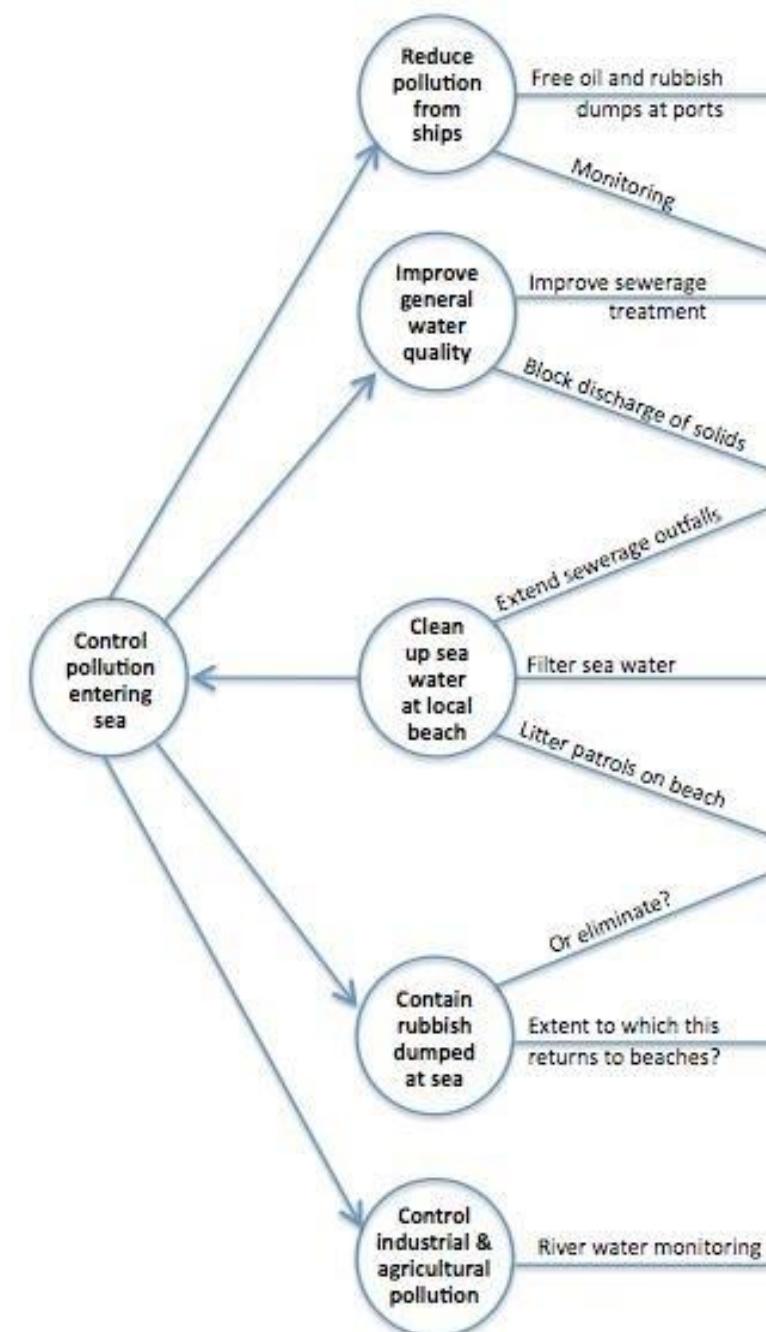




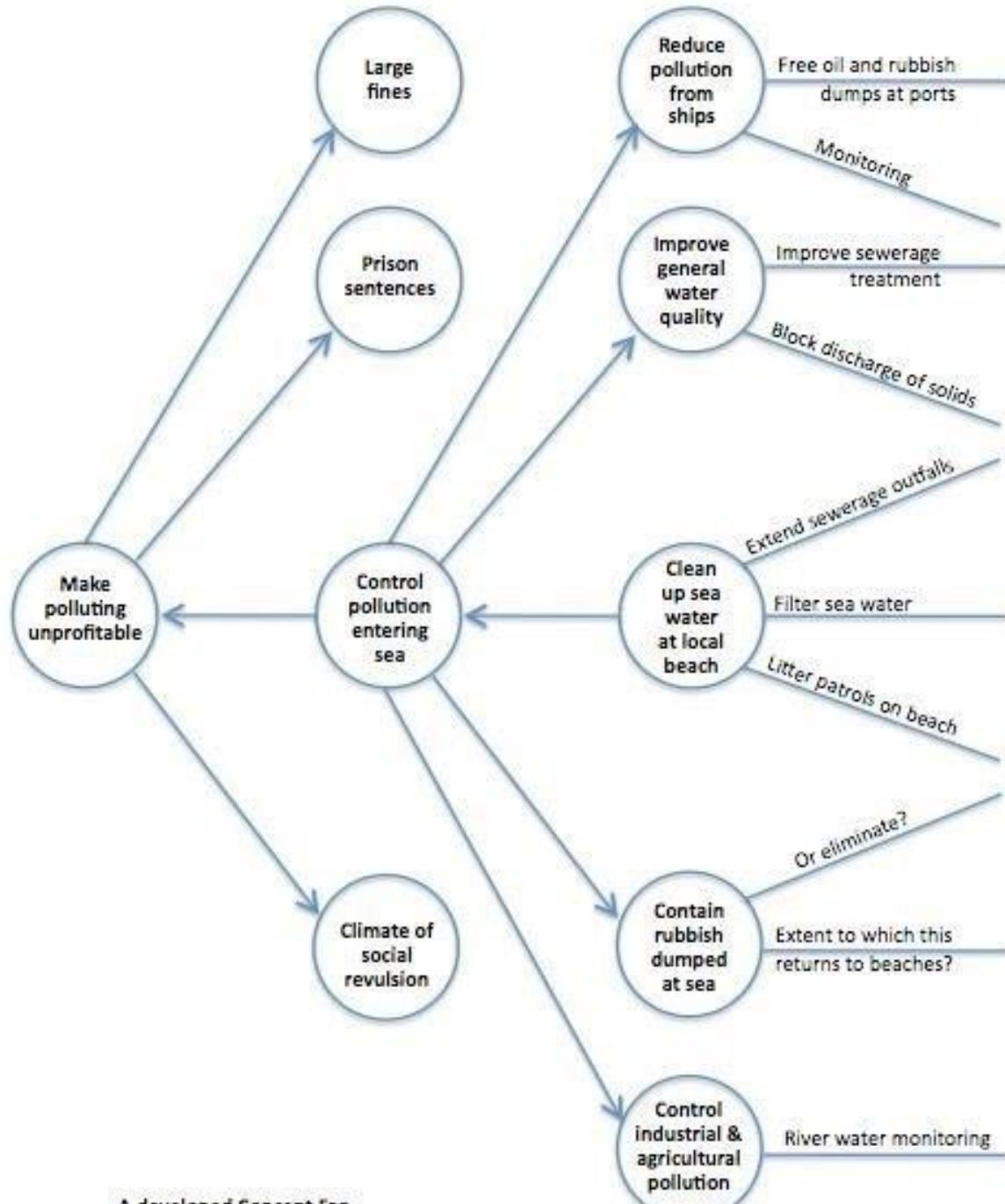
ai pin

Concept Fan Method

Concept Fan



Concept Fan



Literature Survey/ Review

- Pull a chair up to a round-table, and Engage with those notable scholars, researchers and writers, who have addressed your question.
- Where am I in relation to what have already done on the subject.
- The term may sometime be misleading at undergraduate level as we hardly review the literature but situating your work with the literature and identifying gaps and problems with that literature.
- Highlight the Strengths and Weaknesses, some areas need strengthening or elaborating.
- Driven by Research Question

Definitions from Oxford Languages · [Learn more](#)

 **review**
/rɪ'vju:/

noun

1. a formal assessment of something with the intention of instituting change if necessary.
"a comprehensive review of UK defence policy"
2. a critical appraisal of a book, play, film, etc. published in a newspaper or magazine.
"she released her debut solo album to rave reviews"

verb

1. assess (something) formally with the intention of instituting change if necessary.
"the Home Secretary was called on to review Britain's gun laws"
2. write a critical appraisal of (a book, play, film, etc.) for publication in a newspaper or magazine.
"I reviewed his first novel"

Similar: [analysis](#) [evaluation](#) [assessment](#) [appraisal](#) [examination](#) [criticism](#) [critique](#) [write-up](#) [notice](#) [assessment](#) [evaluation](#)

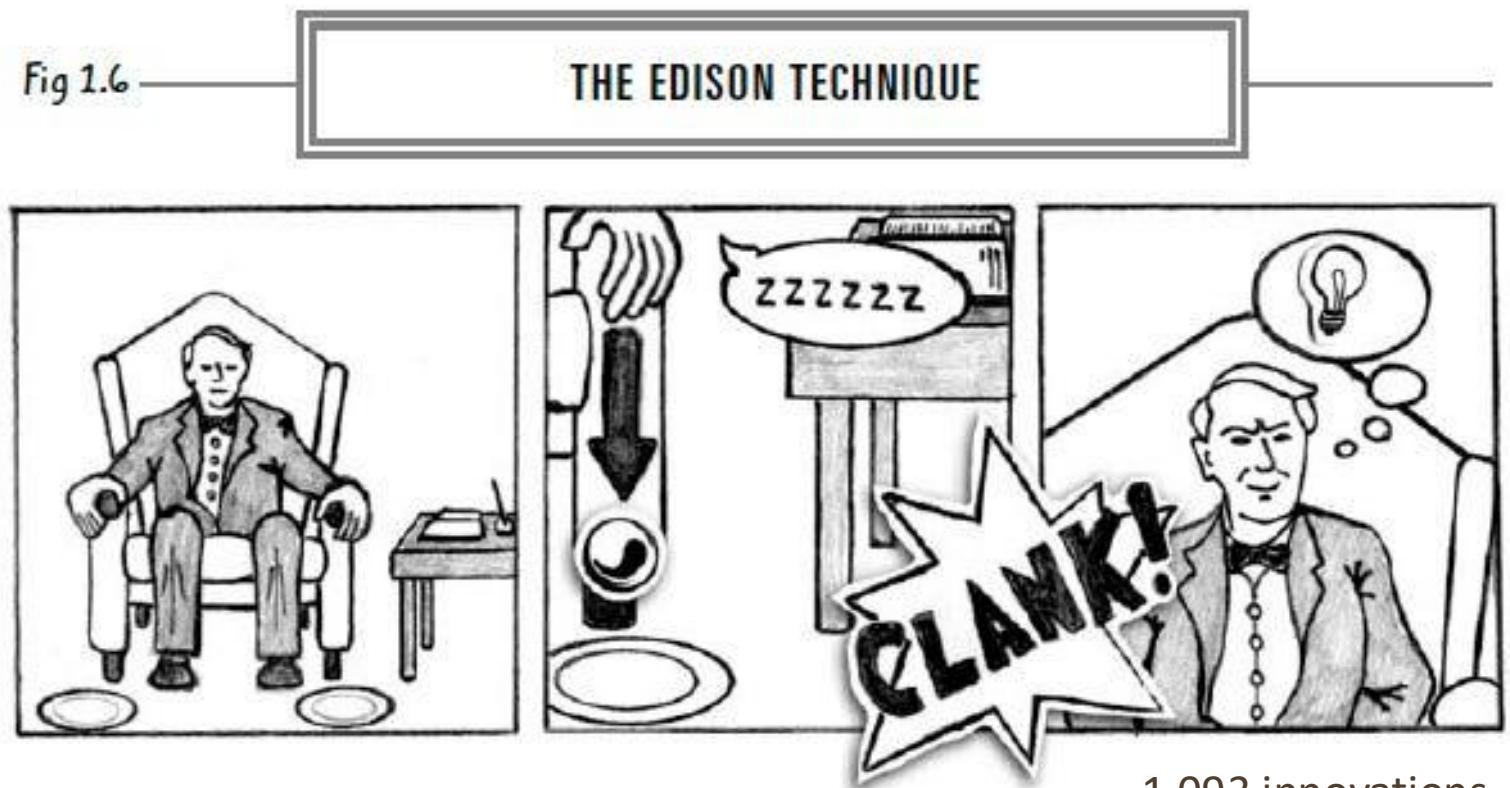
Research Question

- Address a question that hasn't be answered
- Must address something of significance
- Researchable ?

Ideation and personas

- 'Aha' moment

Fig 1.6



1,093 innovations

<https://uxdesign.cc/why-do-creative-people-need-time-to-sit-around-and-do-nothing-307f3d8d7b16>



Example: Mind Mapping ‘Strategies for Climate Change’ Essay Topic



The British Dyslexia Association states, "Dyslexics struggle with their spoken and/or written language, following instructions, poor concentration and carrying out analytical or logical tasks. Strategies such as mind mapping are recognized as valuable learning tools."

The British Dyslexia Association, www.bdadyslexia.org.uk.



Motivation

- Justification
 - Impact
 - Value of outcomes
 - Validity of outcomes
 - Implementation
 - Economic feasibility
-
- Upliftment of Quality of Life
 - Serving the humanity



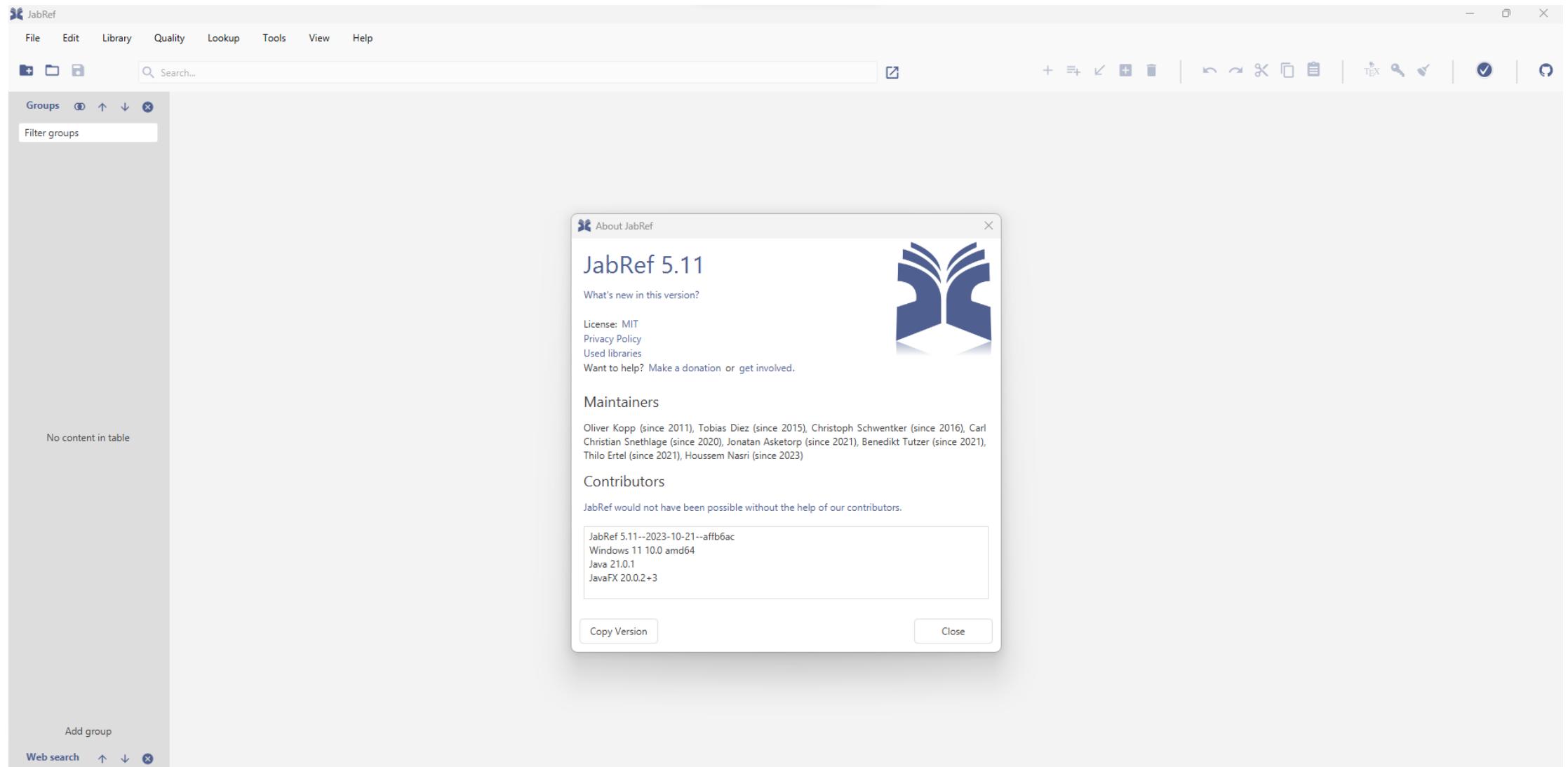
Writing and Keeping Notes

- Do never wait for the last moment
- Write while you work – may be even daily basis
 - Adding gradually to the main argument
 - Remove the not relevant
 - So, ideas evolve in writing
 - Also building up the strength and quality.
- Always keep references with relevant facts
- Paraphrasing
- Plagiarism

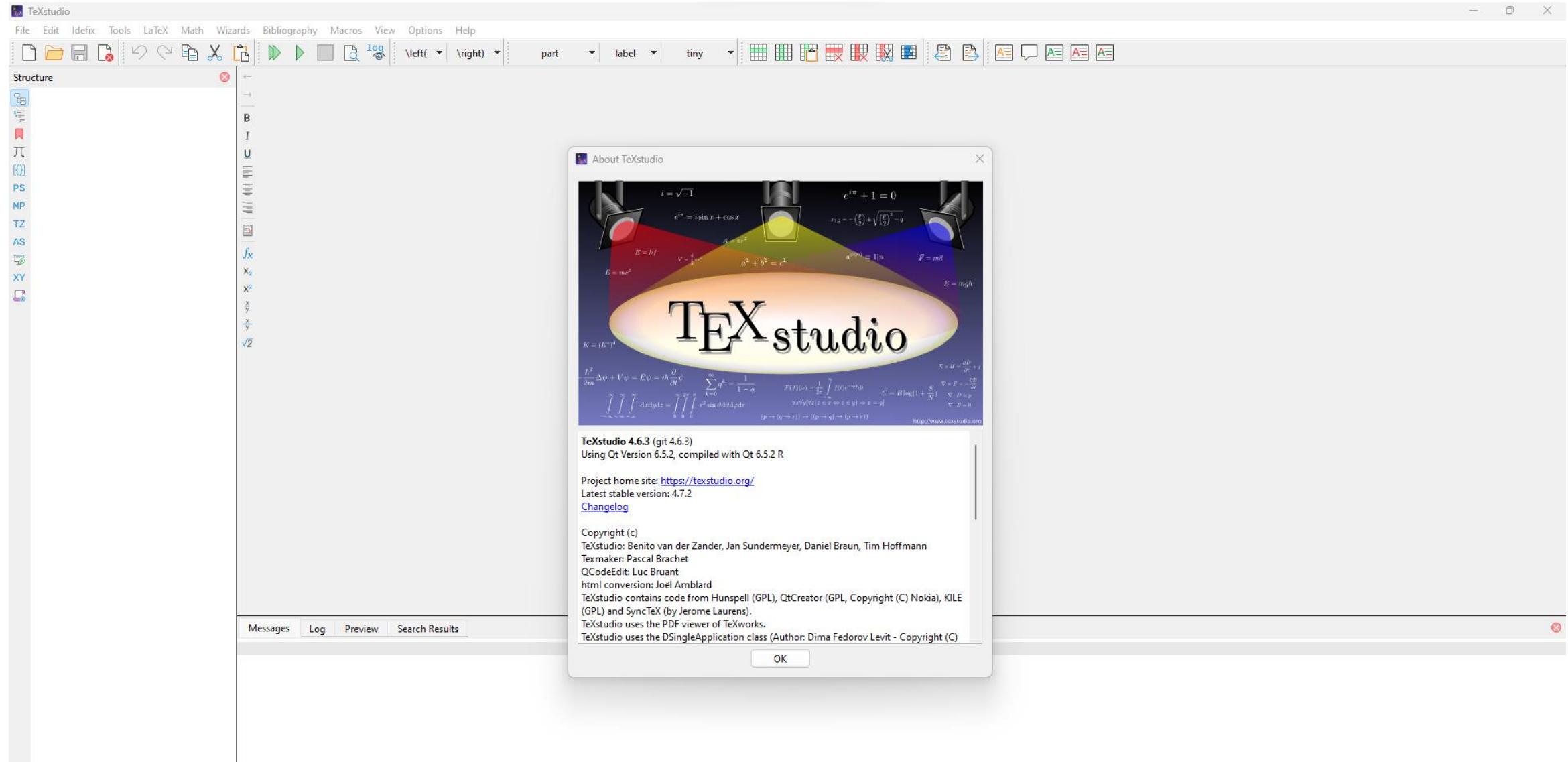
- Online tools



Referencing Tools



Typesetting Tools



Online Tools

The screenshot shows the IEEE Xplore digital library homepage. At the top, there's a navigation bar with links to IEEE.org, IEEE Xplore, IEEE SA, IEEE Spectrum, and More Sites. On the right side of the header, there are links for Donate, Cart, Create Account, and Personal Sign In. The main title "IEEE Xplore®" is on the left, along with "Browse", "My Settings", and "Help" dropdown menus. A sign-in box in the center displays "Access provided by: KDU - Gen. Sir John Kotewala Defence University" and a "Sign Out" link. The central banner features the text "Advancing Technology for Humanity" and "SEARCH 6,206,047 ITEMS". Below the search bar are buttons for "All", "ADVANCED SEARCH", and "TOP SEARCHES". A green banner at the bottom left promotes the "IEEE Climate Change Collection" with the text: "As the world's largest organization of technical professionals, IEEE is uniquely positioned to help organize the world's engineers, scientists, and technical professionals in addressing the causes, mitigating impacts, and adapting to climate change." It includes a "Go to the Collection" button and an image of hands holding a globe surrounded by greenery.

ieeexplore.ieee.org/Xplore/home.jsp

Basis Set Exchange... Rangsiman Ketkae... Rangsiman Ketkaew Clean Energy Demo... CO2SIM (Flowsheet...

IEEE.org | IEEE Xplore | IEEE SA | IEEE Spectrum | More Sites

Donate | Cart | Create Account | Personal Sign In

IEEE Xplore® Browse ▾ My Settings ▾ Help ▾

Access provided by:
KDU - Gen. Sir John
Kotelawala Defence
University

Sign Out

Advancing Technology for Humanity

SEARCH 6,206,047 ITEMS

All ADVANCED SEARCH TOP SEARCHES

IEEE Climate Change Collection

As the world's largest organization of technical professionals, IEEE is uniquely positioned to help organize the world's engineers, scientists, and technical professionals in addressing the causes, mitigating impacts, and adapting to climate change.

Go to the Collection



Online Tools

www.researchgate.net

Basis Set Exchange... Rangsiman Ketkaew... Rangsiman Ketkaew... Clean Energy Demo... CO2SIM (Flowsheet...)

ResearchGate Home Questions Jobs Search for research, journals, people, etc. Add new

Mohamed A. Mohamed was cited in a publication in 1s.

Faulty feeder selection based on improved Hough transform in resonant grounded distribution networks Article February 2024 · 4 Reads International Journal of Electrical Power & Energy Systems Xiaowei Wang · Xinyu Qu · Liang Guo · [...] · Peng Wang Request full-text Save Follow Recommend Share

Hads Gimhana added a preprint 4d ago.

Novel and Real-Time GPU Accelerated Speed Violation Detection and License Plate Identification System Preprint October 2021 · 145 Reads Udaya Dampage · KKN Hasantha · Hads Gimhana · [...] · SV Maddumage Download Save Share

Always Mahindruwa and 2 others follow this research item

Research Spotlight Beta Want 4x more reads of your recent work? Showcase your work in a Spotlight to get 4x more reads on average. Learn more Create Spotlight

Jobs you may be interested in

Nanyang Assistant Professorship (NAP) Expires in 5 days Nanyang Technological University

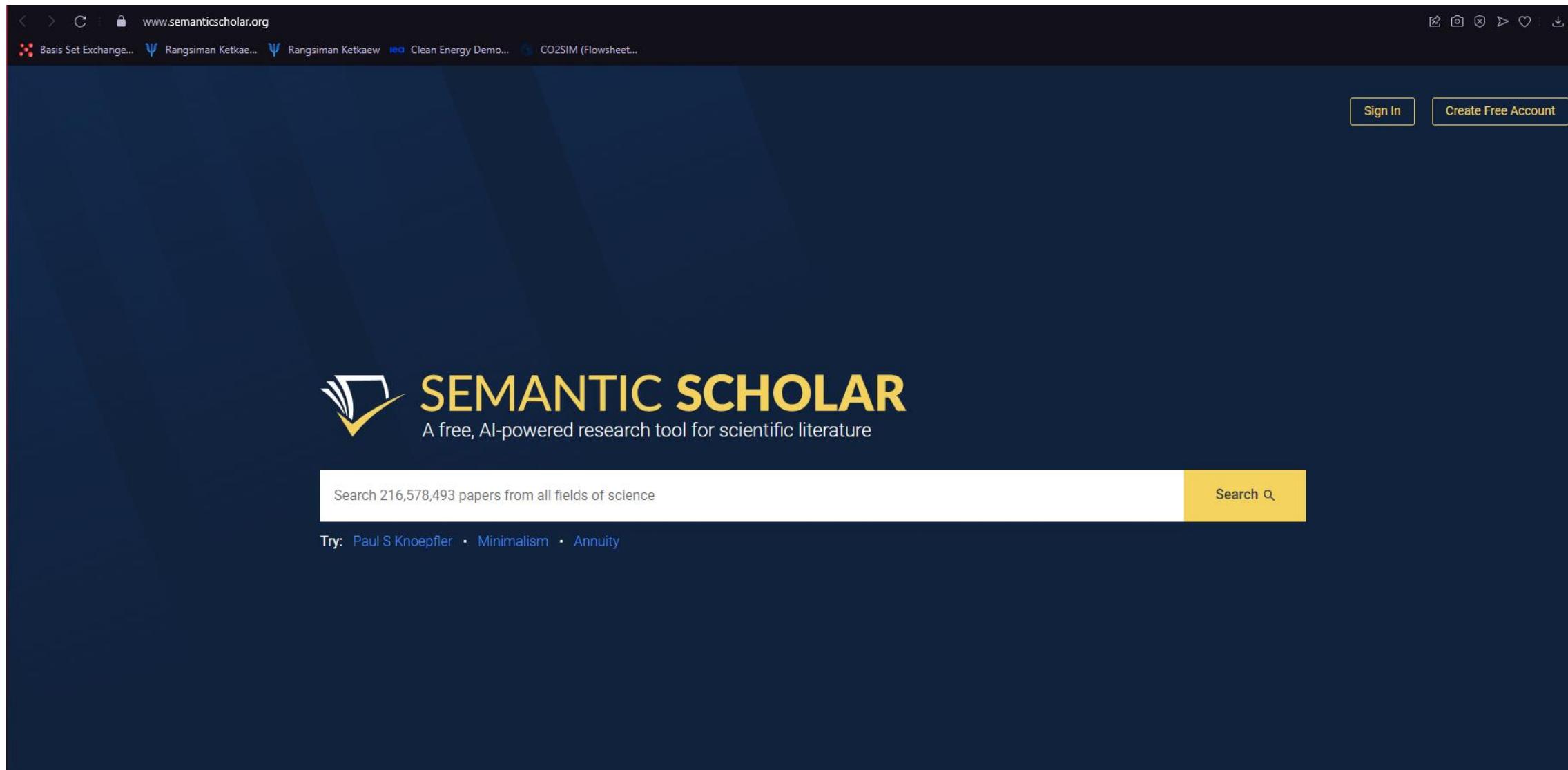
Assistant Professor(s) / Associate Professor(s) (Sustainability Governance) Expires in 3 days The Chinese University of Hong Kong

Xidian University Hangzhou, China

160+ million publication pages, 25+ million researchers



Online Tools



The screenshot shows the Semantic Scholar homepage. At the top, there is a navigation bar with icons for back, forward, search, and user account. The URL www.semanticscholar.org is visible. Below the navigation bar, there are several small thumbnail previews of research papers. On the right side of the header, there are "Sign In" and "Create Free Account" buttons. The main content area features the Semantic Scholar logo, which consists of a stylized yellow 'S' icon followed by the text "SEMANTIC SCHOLAR". Below the logo, it says "A free, AI-powered research tool for scientific literature". A search bar at the bottom left contains the text "Search 216,578,493 papers from all fields of science". To the right of the search bar is a yellow "Search" button with a magnifying glass icon. Below the search bar, there is a suggestion "Try: Paul S Knoepfler • Minimalism • Annuity". The background of the page is dark blue.



Online Tools

The screenshot shows the homepage of ResearchRabbit.ai. At the top, there's a navigation bar with links like 'Basis Set Exchange...', 'Rangsiman Ketkaew', 'Clean Energy Demo...', and 'CO2SIM (Flowsheet...'. On the right side of the header are icons for a magnifying glass, camera, and download, followed by a 'Log In' button.

The main visual is a large, light blue polygonal network graphic that slopes upwards from the bottom left towards the top right. Overlaid on this graphic is a white rectangular area containing the 'ResearchRabbit' logo (a stylized rabbit icon) and the text 'Reimagine Research' in a large, bold, black font. Below this, a smaller text block reads 'We're rethinking everything: literature search, alerts, and more'. A blue button with the text 'Sign up' is located at the bottom left of this white area. In the center-right of the white area, there's a large red circular button with a white play icon (triangle pointing right).



Online Tools

The screenshot shows the Inciteful website homepage. At the top, there's a dark header bar with navigation icons and the URL "inciteful.xyz". Below the header, a navigation menu includes links like "Basis Set Exchange...", "Rangsiman Ketkae...", "Rangsiman Ketkaew", "Clean Energy Demo...", and "CO2SIM (Flowsheet...)". The main title "Inciteful" is displayed with a purple geometric logo. To the right is a search bar with the placeholder "Paper title, DOI, PubMed URL, or arXiv URL" and a purple search icon. Below the search bar, the tagline "Tools to help you accelerate your research" is prominently displayed in large white and purple text. A descriptive paragraph below the tagline says: "Build a network of academic papers and we'll analyze the network to help you **discover** the most relevant literature." To the right, another section says: "Select two papers and we will show you how the **literature connects** them together." It features two input fields: "From:" and "To:", both with the placeholder "Paper title, DOI, PubMed URL, or arXiv URL". Between the fields is an "OR" button. Below the fields is a purple search icon. The bottom of the page has a decorative footer with a grid pattern.

Find the most relevant literature, faster

The goal of Inciteful is to give the world free tools to help accelerate academic research. If that means getting up to speed on a new topic, finding the latest literature, or figuring out how two ideas are connected, we can help. Unlike a traditional search engine, citations are the cornerstone of all of our tools. Building these tools for all academic literature has only recently been possible with the rise of open scholarly bibliographic data and the amazing work being done by these groups. To date we have two tools. Paper Discovery and the Literature Connector. More tools are actively under development. The Paper Discovery tool builds a network of papers from citations, uses network analysis algorithms to analyze the network, and gives you the information you need to quickly get up to speed on that topic. You can find the most similar papers,

Our second tool was the Literature Connector. Intended for interdisciplinary scholars trying to bridge two domains, it allows you to enter two papers and it will give you an interactive visualization showing you how they are connected by the literature. From there you can send the papers you find into our Paper Discovery tool to find other relevant literature which happened to not be the "shortest path" between the two papers.

Inciteful is under active development and our hope is that, over time, our tools will build upon each other giving you an unrivaled experience for quickly discovering new literature.

Being built off the backs of free and open data, we commit to paying it forward by keeping our own tools free for everyone. To learn more, head over to our about page.



Online Tools

The screenshot shows the SciSpace web application. At the top, there's a navigation bar with a back arrow, forward arrow, a refresh button, and a lock icon. The URL 'typeset.io' is displayed. Below the URL, there are several tabs: 'Basis Set Exchange...', 'Rangsiman Ketkaew...', 'Rangsiman Ketkaew', 'Clean Energy Demo...', and 'CO2SIM (Flowsheet...)'. The main header 'SCISPACE' is on the left, and an 'Upload PDF' button is on the right.

On the left side, there's a vertical sidebar with icons for Home, Recent, Search, Chat, and Help. The 'Search' icon is highlighted. Below the sidebar, there's a list of academic questions:

- Q How does climate change impact biodiversity?
- Q Why are aging Covid patients more susceptible to severe complications?
- Q How does social media affect the college selection process?
- Q What are the interesting theories about dark matter and dark energy?
- Q What is the significance of higher-dimensional algebra?

In the center, there's a search bar with the placeholder 'Get insights from top papers directly' and a 'TRY NEW AI SEARCH' button. Below the search bar, a text box says: 'SciSpace is an incredible (AI-powered) tool to help you understand research papers better. It can explain and elaborate most academic texts in simple words.' There are navigation arrows on either side of this text. Below the text, there's a profile picture of Mushtaq Bilal, PhD, and the text 'Researcher @ Syddansk Universitet'.

At the bottom, there are logos for Harvard University, Johns Hopkins University, Stanford University, University of Cambridge, and Yale University. The text 'Loved by 1 million+ researchers from' is also present at the bottom left.

Online Tools

The screenshot shows the homepage of the Bibliometrix website. At the top, there is a dark header bar with navigation icons and the URL www.bibliometrix.org/home/. Below the header, there is a row of links: Basis Set Exchange..., Rangsiman Ketkaew..., Rangsiman Ketkaew..., Clean Energy Demo..., CO2SIM (Flowsheet...). The main content area features the word "BIBLIOMETRIX" in large blue letters, with a smaller "BIBLIOMETRIX" below it. Below that, the text "AN R-TOOL FOR COMPREHENSIVE SCIENCE MAPPING ANALYSIS" is visible. A "Read More" button is located at the bottom left of the main image. The footer contains a copyright notice: "© UdayaDampage 08/2018". On the far right, there is a small logo.

Online Tools

The screenshot shows the Microsoft Power BI product page on a web browser. The URL in the address bar is www.microsoft.com/en-us/power-platform/products/power-bi. The page features a large, abstract graphic of overlapping yellow and orange shapes on the right side. At the top, there is a navigation bar with links for Microsoft, Power Platform, Power BI, About Power Platform, Products, Pricing, Resources, Buy now, Start free, and Sign in. A promotional banner at the top of the main content area encourages users to join the Microsoft Fabric Community Conference. The main heading is "Power BI" with the tagline "Uncover powerful insights and turn them into impact". Below this, there is a callout box containing text and two buttons: "Get Started" and "Have an account? Sign in". At the bottom of the page, there are links for Product overview, Use cases, Research and news, Pricing, Interoperability, Security, Customer stories, Resources, Sign in, and Get started. The footer contains the copyright notice "© UdayaDampage 08/2018" and a small logo.

Join us for the [Microsoft Fabric Community Conference](#), the ultimate learning event for Fabric, Power BI, SQL, AI, and more. Use code MSCUST for an exclusive discount. X

Power BI

Uncover powerful insights and turn them into impact

Connect to and visualize any data, and seamlessly infuse visuals into the apps you use every day.

[Get Started](#) [Have an account? Sign in](#)

Product overview Use cases Research and news Pricing Interoperability Security Customer stories Resources [Sign in](#) [Get started](#)

© UdayaDampage 08/2018

Online Tools

www.mindmaps.com/what-is-mind-mapping/

Basis Set Exchange... Rangsiman Ketkae... Rangsiman Ketkaew Clean Energy Demo... CO2SIM (Flowsheet...

mindmaps.com

THE ULTIMATE GUIDE TO MIND MAPPING

HOME MIND MAP BASICS USE CASES BY INDUSTRY

MIND MAP BASICS

What is Mind Mapping

How to Make a Map Software Comparison

USE CASES

Note Taking Brainstorming Project Planning

BY INDUSTRY

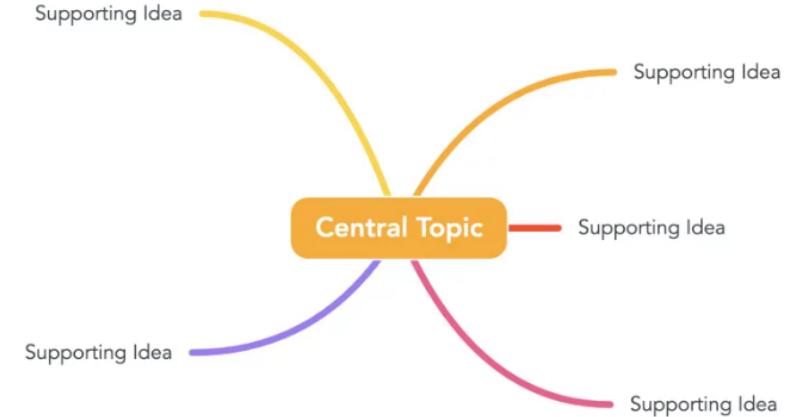
Business Management Education Marketing

<https://www.mindmaps.com>

Understand What is Mind Mapping and Its Many Uses

What is Mind Mapping? What Are Its Uses?

Mind mapping is a powerful technique to help you visually develop and organize ideas and information. Let's take a look at what mind mapping is and how you can use it.



Central Topic

Supporting Idea

Supporting Idea

Supporting Idea

Supporting Idea

Mind Mapping is a powerful note-taking method, great when you need to think creatively. To use effectively, use different colors.



References

- [1] Eberle, R. F. (1972). Developing imagination through scamper. *Journal of Creative Behavior*.
- [2] Serrat, O., & Serrat, O. (2017). The SCAMPER technique. *Knowledge solutions: tools, methods, and approaches to drive organizational performance*, 311-314.
- [3] Straker, D. (2012) Reverse Brainstorming.
- [4] Wilson, C. (2011) Method 4 of 100: Reverse Brainstorming, in 100 User Experience (UX) Design and Evaluation Methods for Your Toolkit. [Accessed: 5th March 2015]
- [5] Mindtools. Reverse Brainstorming, A different approach to brainstorming.
- [6] Mind tools. Assortment of brainstorming techniques.
- [7] <https://www.mindtools.com/c7cpzpf/creativity-tools/creativity-tools>
- [8] <https://www.interaction-design.org/literature/article/learn-how-to-use-the-best-ideation-methods-scammer>
- [9] Roozenburg, N.F.M. and Eekels, J. (1995) Product Design: Fundamentals and Methods, Utrecht: Lemma.
- [10] Cross, N. (1989) Engineering Design Methods, Chichester: Wiley.
- [11] Nicole Viola, Sabrina Corpino, Marco Fioriti and Fabrizio Stesina (2012). Functional Analysis in Systems Engineering: Methodology and Applications, Systems Engineering - Practice and Theory, Prof. Boris Cogan (Ed.), ISBN: 978-953-51-0322-6, InTech, Available from: <http://www.intechopen.com/books/systemsengineering-practice-and-theory/functional-analysis-in-systems-engineering-methodology-and-applications>



"I have not failed. I have just found 10,000 ways that won't work"

Thomas Edison

Thank You..

udayadampage@ieee.org

dampage@kdu.ac.lk

0703 405 405