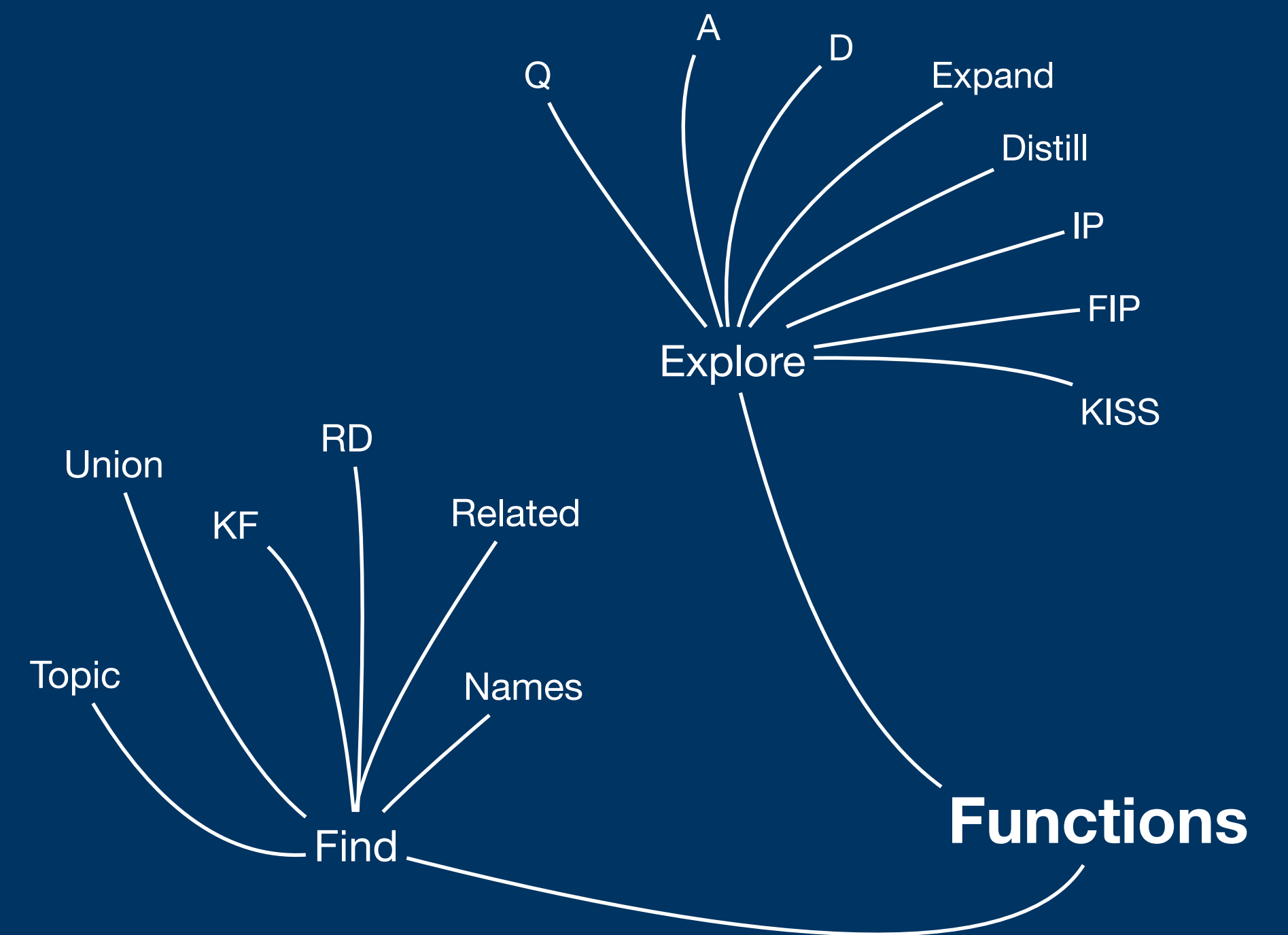


# Innovation Algebra

The Swiss Army Knife for  
Innovators, Entrepreneurs & Creators

Hannes Marais, June 2023



# What is IA?

## ChatGPT “super prompt”



# Innovation Algebra (IA) 2.7 Specification

IA is a functional logic of knowledge, aimed at exploring the knowledge frontier in a structured manner.

## Functions

`Topic(X)` : Retrieves knowledge related to topic X.

`Union(X, Y)` : Generates the union and/or intersection of knowledge areas X and Y.

`KF(X)` : Identifies the knowledge frontier of X, consisting of cutting-edge, state-of-the-art new ideas from journals, experts, and case-studies in the domain X.

`Q(X)` : Lists the top research questions at a PhD level in the domain X.

`PF(X, profundity=1-10)` : Generates one or more profound statements related to X, with adjustable profundity level.


`RD(X)` : Lists valuable expert-level research directions in the domain X.

`CaseStudies(X)` : Scientific-based case studies related to X.


`A(X)` : If X contains questions, answers each of them. Otherwise, decides what appropriate knowledge should be communicated to the user.

**“This is the Construct. It’s our loading program. We can load anything ...  
From clothing to equipment, weapons, training simulations; anything we need.”**


# What do you want to Invent/Create/Learn?



IA is ready to innovate and solve your problems. What are your goals?



reduce noise pollution in cities



To achieve the goal of reducing noise pollution in cities, I propose using the FIRE analysis approach to structure our innovation process. Here's the plan:

**Plan Step:**

- Find:** We'll start by understanding the current state of noise pollution in cities. We need to empathize with the residents, understand the sources of noise, and analyze current efforts in place to mitigate it.

- Pipeline: ``KF("Noise Pollution in Cities") | Insights(S1) | D(S2)``
- Innovate:** Next, we need to think creatively and brainstorm solutions for reducing noise pollution. We could combine different concepts to invent novel solutions.

- Pipeline: ``SCAMPER(ideas=10) | Impr(S4, categories=['Novelty', 'Practicality'])``
- Refine:** After we have a set of innovative ideas, we should critically assess and refine them. This step will help ensure that the solutions are practical, effective, and beneficial.

- Pipeline: ``Score(S5, Categories=['Practicality', 'Scalability', 'Sustainability'])``

Your Goal

IA Functions

"Morpheus: What if I told you that you are ready to innovate?"

# Evaluate the Plan


"Morpheus: There is a difference between knowing the path and walking the path."

4. **Execute:** Lastly, we need to plan on how the best solutions can be implemented in cities. We should consider the stakeholders involved, resources required, and potential barriers.

- Pipeline: ``VC(S6) | Advisors(S7)``

This approach ensures that we systematically analyze the problem, generate innovative ideas, refine the ideas for practicality and sustainability, and plan for effective execution.

Proceed?



y



Evaluate Step:

Find Phase:

Let's start by understanding the current state of noise pollution in cities. We need to empathize with the residents, understand the sources of noise, and analyze current efforts in place to mitigate it.

Pipeline: ``KF("Noise Pollution in Cities") | Insights(S1) | D(S2)``

[S1. Knowledge Frontier of Noise Pollution in Cities]

- Cities around the world are facing increasing levels of noise pollution.
- The main sources include traffic, construction, loud music, and industrial activity.

Innovate Phase:

Now, we will creatively brainstorm solutions for reducing noise pollution by combining different concepts.

Pipeline: ``SCAMPER(ideas=10) | Impr(S4, categories=['Novelty', 'Practicality'])``

[S4. Innovate Ideas]

Idea #	Description	Novelty	Practicality
1	Install smart sound barriers that adapt to traffic noise and use active noise cancellation.	8	6
2	Create mobile apps that allow citizens to report high noise levels.	6	9
3	Develop drones that monitor noise levels and identify sources of excessive noise.	8	7
4	Implement a 'Quiet Night' once a week where non-essential noise is minimized.	7	6
5	Develop urban furniture that absorbs sound and reduces echo.	9	7
6	Implement gamified incentives for communities to reduce noise levels.	7	8
7	Use AI to predict areas at risk of high noise pollution and take preventive measures.	8	6
8	Install vertical gardens on buildings.	7	7



# Hitting a Blank?

(smart sound barriers and drones).

- They recommend seeking environmental grants and community funding for ideas 5 and 8 (urban furniture and vertical gardens).
- They suggest collaborating with local governments for the implementation of idea 10 (zoning laws).

This concludes the FIRE analysis approach to reducing noise pollution in cities. The next steps involve taking these insights and findings and working on execution plans.



++

Please just figure something out ...



## Guru Mode: Plan Step

Having executed the FIRE analysis, we have generated innovative ideas and refined them. Now, it is essential to go beyond and focus on implementation while ensuring the maximum impact and sustainability. Here, I am introducing the next steps that will help in translating the ideas into actionable plans.

1. I will start by assessing the feasibility of the refined ideas by analyzing potential challenges and roadblocks.
2. I will then identify the key stakeholders and formulate a strategy for engaging them effectively.
3. Next, I will focus on creating a project implementation plan that includes the allocation of resources, timelines, and milestones.

## Step 4: Reflect on the Entire Process

[S28. Assessment of Novel Aspects]

1. A comprehensive noise reduction strategy was developed incorporating community involvement, sustainable practices, and innovative technologies.
2. The scaling strategy focuses on standardization and mentorship programs for broader adoption.
3. Integration of continuous improvement and adaptation through data analysis and stakeholder involvement.
4. The creation of startups that focus on different aspects of noise reduction in urban environments.

This iterative process of planning, evaluation, and adaptation has led to the development of a robust and scalable noise reduction strategy that is innovative and community-centric. Through continuous improvement, this strategy has the potential to significantly reduce noise pollution in cities and enhance the quality of life for urban residents.



Assess

What did we discover ?



[S29. Novel Aspects and Achievements]

During this IA session, we have discovered and developed the following novel aspects in reducing noise pollution in cities:

1. **Community-Driven Approach:** By emphasizing community involvement, we ensured that the noise reduction strategy is tailored to the specific needs and priorities of local residents. This



# Delve into Functions



POV

Give me contrastive points-of-view



[S34. Contrastive Points of View from Experts on the IA-Developed Approach]

Expert A: Urban Planner

- **Supportive:** “The IA-Developed Approach incorporates several innovative ideas that show promise. The combination of technology and community engagement can bring about positive changes in the urban soundscape. The green noise barriers are particularly exciting, as they can simultaneously address noise pollution and environmental concerns.”
- **Critical:** “The practical implementation of urban noise cancellation systems may pose logistical and financial challenges. Additionally, ensuring sustained community engagement might be difficult.”

Expert B: Environmental Scientist

- **Supportive:** “Using green noise barriers to combat noise pollution is a great idea. It not only addresses the noise issue but also contributes positively to the urban ecosystem. The emphasis on continuous data-driven improvement can help in adapting the strategies to changing environmental conditions.”
- **Critical:** “The urban noise cancellation technology might consume a considerable amount of energy, which could have an environmental impact. A sustainable source of energy should be considered for these systems.”



Pareto

Apply 80/20 rule



Using the Pareto Analysis, also known as the 80/20 rule, we will focus on identifying the 20% of the solutions that will have the 80% impact in overcoming the major challenges associated with reducing noise pollution in cities. This analysis will help prioritize the most effective solutions to concentrate efforts where they can have the most significant impact.

The major challenges were:

1. Logistical and financial challenges in implementing urban noise cancellation systems.
2. Ensuring sustained community engagement.
3. Energy consumption of urban noise cancellation technology and its environmental impact.
4. Necessity for a cost-benefit analysis of large-scale noise cancellation systems and sensor networks.
5. Integration of health determinants in urban settings.
6. Scalability and reliability of urban noise cancellation systems.
7. Robustness of technologies for different urban environments.

This analysis provides a structured approach to addressing the challenges associated with the proposed solution for reducing noise pollution in cities. By employing innovation, refinement, and execution strategies, it becomes feasible to develop effective noise reduction measures while considering financial, logistical, environmental, and community engagement aspects.

# Swiss Army Knife of Functions ...

1. `Topic("quantum computing") | D | Names`

IA Function Pipeline

- **Explanation:** Retrieves knowledge about quantum computing, provides detailed information including algorithms and techniques related to quantum computing, and then lists top people, companies, and products that are related to quantum computing.

2. `Topic("artificial intelligence") | KF | Q | A`

- **Explanation:** Retrieves knowledge on artificial intelligence, identifies the cutting-edge ideas in the domain, lists top research questions, and then answers each of them.

3. `Essay("space exploration", tokens=500, profundity=8, emotionalImpact=7)`  
`| Title | Abstract`

- **Explanation:** Generates an essay on space exploration with approximately 500 tokens, with a high profundity level and emotional impact, then creates a title for the essay and generates an abstract that summarizes the content and insights.

4. `Union("blockchain", "supply chain management") | RD | Startups`

- **Explanation:** Generates the union of knowledge areas blockchain and supply chain management, lists valuable research directions in this combined domain, and invents startups based on these research directions.

5. `Topic("climate change") | PF(profundity=10) | Impr(categories=`  
`["Practicality", "Emotional Impact"])`

- **Explanation:** Retrieves knowledge on climate change, generates profound statements related to climate change, and then evaluates and suggests improvements for these statements based on their practicality and emotional impact.

6. `P("neuroscience")`

- **Explanation:** Generates a conversational persona that is an expert on neuroscience and explains the persona's capabilities.

"Morpheus: What if I told you that you have a function."



# Creative Writing Functions

1

H

Topic("This is your last chance. After this, there is no turning back. You take the blue pill - the story ends, you wake up in your bed and believe whatever you want to believe. You take the red pill - you stay in Wonderland, and I show you how deep the rabbit hole goes.") | POV | Essay(emotionalImpact=9, profundity=5)



Before evaluating the IA expression, let's briefly explain what will be accomplished. The expression is composed of functions pipelined together to create an output. It starts with the ``Topic()`` function, which retrieves knowledge related to the quote from The Matrix movie about the choice between the red pill and the blue pill. This output is then fed into the ``POV()`` function, which will create contrastive points of view from experts in the knowledge frontier. Finally, the output of contrastive points of view is passed to the ``Essay()`` function, which generates an essay with a high level of emotional impact and a medium level of profundity. Now, let's execute this pipeline.



2

## [S1. Points of View]

The quote provided is from The Matrix, a science fiction movie. In the movie, this dialogue is an allegory representing a choice between accepting reality (taking the red pill) and living in blissful ignorance (taking the blue pill).

### Expert 1: Philosopher

- **Point of View:** This choice symbolizes the philosophical question of whether it is better to face a harsh reality or live in a comfortable illusion. Philosophically, this can be compared to Plato's Allegory of the Cave, where individuals are chained to a cave wall and mistake shadows for reality. The red pill represents breaking the chains and seeing the world as it truly is, whereas the blue pill is a choice to remain in ignorance.

### Expert 2: Technologist

- **Point of View:** From a technological perspective, the red and blue pills symbolize the possibilities and consequences of advanced technology. The red pill represents embracing the potential of technology to change our understanding of reality and reshape society. The blue pill represents a choice to remain within the comfort zones of current technology and not be disrupted by the innovations.

### Expert 3: Psychologist

- **Point of View:** From a psychological perspective, the red and blue pills could symbolize the decision-making process and the cognitive biases that can influence it. The red pill is analogous to

3

## [S2. Emotional Essay]

Title: *The Duality of Choice: A Dive into the Rabbit Hole of Reality and Illusion*

In a world suffused with the cacophony of choices, a chilling silence pervades the air when one is presented with a decision that bears the weight of existence itself. The Matrix, a tapestry woven with threads of science fiction and philosophy, holds a mirror to our faces, asking - "Do you dare to see the truth?"

We stand at the precipice with Neo, as the haunting words of Morpheus echo - a choice between the red pill and the blue pill; between embarking on a journey through the labyrinthine depths of reality or swaddling oneself in the comforting embrace of illusions. A philosopher would see this as an eternal crossroads of existence, where shadows dance in Plato's cave, taunting those who dare to venture out into the light. The light is harsh and unforgiving, but it is the torch that illuminates the world in its rawest form.

But wait, whispers a technologist. The red and blue pills are not just capsules of choice but symbolic of the metamorphosis brought upon by the relentless waves of technology. We are in an era where technology can pull back the curtains of reality or build sumptuous palaces of illusions. With every click, every scroll, we make our choice. Do we harness the power of technology to transcend the human condition, or do we let it lull us into pixelated daydreams?

However, the psychologist raises a finger, reminding us that the fabric of choice is woven within the human mind. The clash between the red and blue pills reflects our cognitive dissonance. Our minds are battlegrounds where comfort and growth wrestle tirelessly. The blue pill, with its siren call, beckons us to the shores of complacency. The red pill, though bitter, holds the seeds of metamorphosis.



# .. And many “Thinking” Frameworks

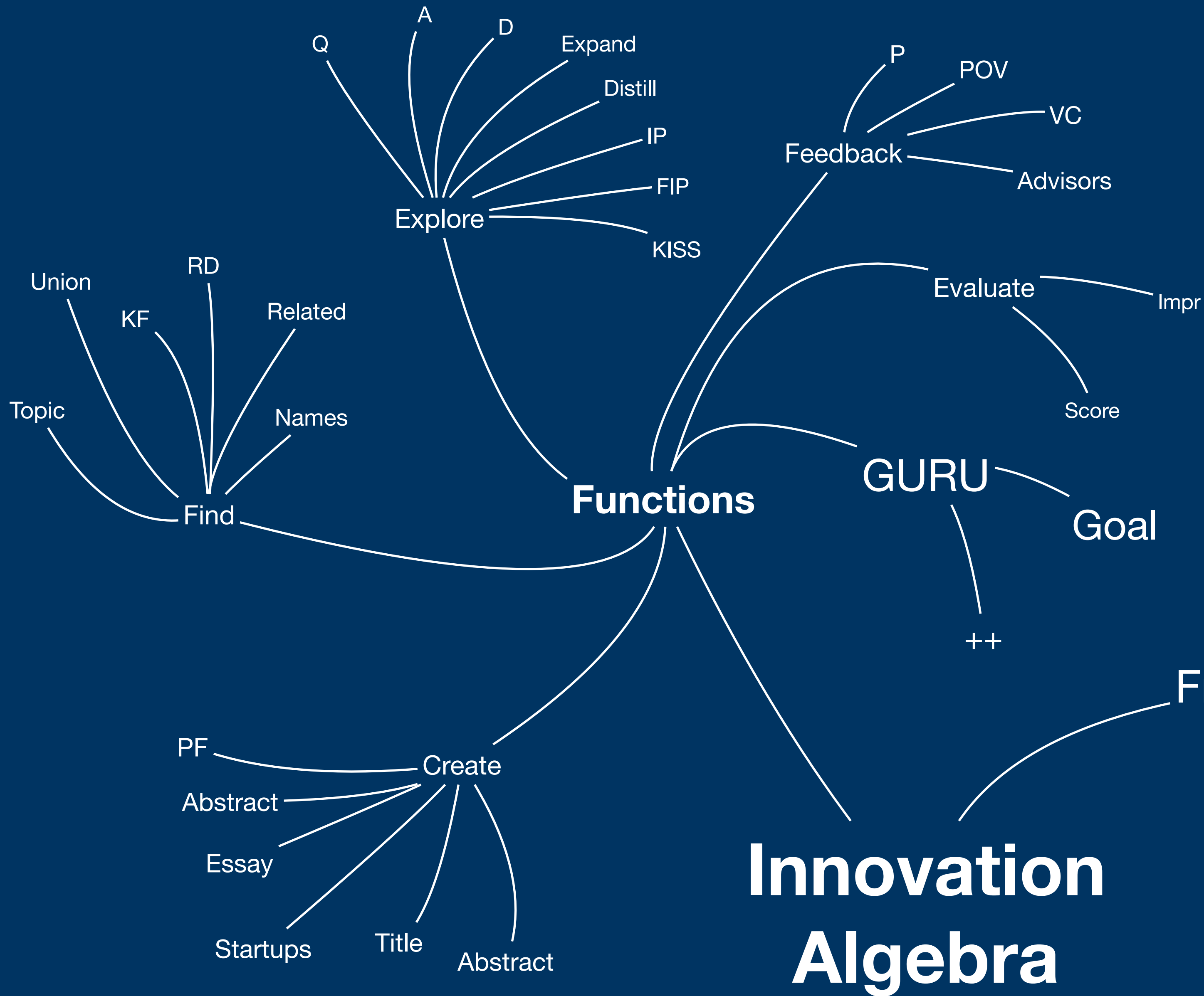
1. **SCAMPER** - It stands for Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, and Reverse. It's a brainstorming tool used to improve products or services. For example, you can substitute a component of a product with something else, combine it with another product, or adapt it for a different use.
2. **Design Thinking** - A methodology for solving complex problems. It involves understanding the human needs involved, re-framing the problem, creating many ideas in brainstorming sessions, and adopting a hands-on approach in prototyping and testing.
3. **6 Hats** - Edward de Bono's Six Thinking Hats is a tool for group discussion and individual thinking involving six colored hats. Each color represents a different perspective. It's used to look at decisions from multiple viewpoints.
4. **5 Whys** - A problem-solving technique that involves asking "why" five times to get to the root cause of a problem.
5. **TRIZ** - A Russian acronym for "Theory of Inventive Problem Solving". It's a methodology for systematic problem solving. It's based on logic, data, and research, not intuition.
6. **Starbursting** - A brainstorming technique focusing on generating questions. It helps in exploring new avenues and challenges by questioning every aspect of the project.
7. **SWOT** - Stands for Strengths, Weaknesses, Opportunities, and Threats. It's a strategic planning tool for identifying and analyzing these four elements of a project or business venture.
8. **Lotus Blossom** - A diagram used for exploring all the elements of a problem. It encourages you to elaborate on the problem by looking at it from multiple angles.
9. **Problem Reversal/Reverse Brainstorming** - It involves reversing the problem's direction. Instead of asking how to solve it, you ask how you could cause it. It often leads to unique solutions.
10. **Brainstorming** - A group creativity technique used to find a solution for a specific problem by gathering a list of ideas contributed by participants.

11. **Mind mapping** - A graphical way to represent ideas and concepts. It's visual thinking tool that helps structuring information, helping you to analyze, comprehend, synthesize, recall and generate new ideas.

"Neo: I know kung fu."

**"Morpheus: Show me."**





- SCAMPER
- Design Thinking
- 6 Hats
- 5 Whys
- TRIZ
- Starbursting
- SWOT
- Lotus Blossom
- Problem Reversal/Reverse Brainstorming
- Brainstorming
- Mind Mapping
- Business Model Canvas
- Metrics
- Headlines from the Future
- PESTEL
- Porter's Five Forces
- Value Proposition Canvas
- Ishikawa Diagram/Fishbone Diagram
- Kano Model
- Jobs to be Done (JTBD)
- Critical Path Method (CPM)
- Pareto Analysis/80-20 Rule
- Story Mapping
- Scenario Planning
- Growth-Share Matrix (BCG Matrix)
- Force Field Analysis
- MoSCoW Method
- Rapid Prototyping
- Decision Matrix Analysis
- Cynefin Framework

# Get more kung fu

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hannes-marais

Update README.md

76f20c6 8 hours ago

109 commits

FIRE.md	Create FIRE.md	5 days ago
Firefly the brain of a ma...	Add files via upload	4 days ago
IA.001.jpeg	Add files via upload	2 days ago
LICENSE	Initial commit	5 days ago
README.md	Update README.md	8 hours ago
ai-risk.md	Create ai-risk.md	5 days ago
cheatsheet.md	Create cheatsheet.md	5 days ago
city-planning.md	Update city-planning.md	20 hours ago
examples.md	Update examples.md	5 days ago
ia-gpt-4.md	Update ia-gpt-4.md	2 days ago
swiss-army-knife-for-e...	Update swiss-army-knife-for-entrepreneurs.md	5 days ago

About

Innovation Algebra (IA) for ChatGPT is the Swiss Army knife for knowledge processing and innovation.

ai

innovation

chatgpt

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## Get Started Now

- >>> [Start chatting IA 2.6 <<<](#)
- >>> [Start chatting IA 2.5 <<<](#)
- >>> [Start chatting IA 2.2 <<<](#)
- >>> [Start chatting IA 2.1 <<<](#)

Under Development:

- >>> [Start chatting IA 2.7 <<<](#) - Includes functions like CaseStudies, Insights, Assess, a more explicit planning logic, clearer representation. **Note:** Does not work on ChatGPT 3.5/Turbo.

Instructions:

- Click the above link to open a saved ChatGPT session with the IA prompt loaded.
- Click 'Continue the conversation'.
- Start using IA. For example type `Topic("AI risk") | ++` [\(IA Response\)](#).
- Tip:** If you are stuck, simply type `++` to consult the Guru (IA 2.5+).

## Case Studies

Innovating and solving real problems is .. **complex**.

IA aspires to solve real-world problems using AI. Hence IA is more complex than the typical ChatGPT prompt. Plus IA uses frameworks that you probably never heard of before.


The best way to get a feeling for how IA can be used is the case studies.

- [Noise Pollution II](#) - Preview of IA 2.7 (under testing), with strategy and addition functions like case studies, insights, etc. This very representative of the state-of-the-art for IA. IA 2.7 does much better than the previous version, compare with Noise Pollution I.
- [Synthetic Cells](#) - IA 2.7 allows you to explore the knowledge frontier of science. Pick the topic example.
- [Using Metrics to Decide When to Abandon Your Startup](#) - Example using IA for technical writing.
- [Revitalizing Cities](#) - Explores new policies around city revitalization.
- [Chore Innovation](#) - What do to with home chores?
- [A New Type of Light](#) - Inventing a new type of light. Unfortunately ChatGPT ran out of context. But it helps invents something new and interesting. Covers community building, privacy, human psychology. Read till the end for the reveal.
- [Reintroducing Animals into Cities](#) - Conservation, public policy, and regulations. Covers a myriad of issues in 22 parts. (Runs out of context)
- [Grid-scale Energy Storage, Role of Regulatory Sandboxes](#) - Energy policy; used design thinking, TRIZ, pareto principle, technical writing.
- [Noise Pollution I](#) - Starts with irritating problems, a lot of talk about new car horns, no conclusion.
- [Inspired by Nature](#) - Develops several ideas related to smart agriculture, including a "smart plant".
- [Smart cities](#)
- [Human Hibernation](#)
- [Idea generation using frameworks](#)
- [Startup Generation](#)
- [IA Tutorial](#)





# Join & Learn

“The Oracle: We can never see past the choices we don't understand”



## The Innovation Algebra Users Group

Innovation Algebra (IA) for ChatGPT is the Swiss Army knife for cutting edge knowledge processing and innovation.

### Join the IA community

Are you a user of Innovation Algebra? Interested in getting the latest tips and tricks? Or meeting others also operating on the knowledge frontier?


### Join Our Mailing List

Receive low-volume email announcements regarding Innovation Algebra developments and online events.

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### Events

JUN  
23





#### Innovation Algebra Brainstorming


Fri, Jun 23, 9:00 AM - 10:00 AM PDT

Deeep 



524 Tweets






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@HiDeeeps

Innovation Algebra for ChatGPT | Extreme Knowledge Discovery | Research Automation |  ++ 

 Science & Technology 

 San Francisco Bay Area

 [github.com/hannes-marais/...](https://github.com/hannes-marais/)

 Joined August 2014

# Thanks for watching!

**“You: I know kung fu.”**