SUPERMIND DESIGN PRIMER

MIT Center for Collective Intelligence
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Our world is filled with complex systems of people and machines that we humans have designed, from companies and governments to economies and societies. And as technologies and human desires change, the configurations of these systems often need to change, too. Supermind Design is an approach that emphasizes generating innovative new possibilities for how to configure these systems.

What is Supermind Design?

WHAT ARE SUPERMINDS?

A supermind is *a group of individuals acting together in ways that seem intelligent.** For example, companies, governments, labor markets, scientific communities, the editors of Wikipedia, and the US economy are all superminds because they all include groups of interacting individuals that—at least sometimes—seem intelligent. In other words, "supermind" is a short way of saying "collectively intelligent system."

WHAT IS SUPERMIND DESIGN?

Supermind Design is simply *the process of designing superminds.* The heart of Supermind Design is generating lots of ideas to increase the chances of finding a few good ones. In addition to your own spontaneous ideas, Supermind Design includes a set of activities (called moves) which you can use to trigger more—and often more unconventional—ideas.

WHEN IS SUPERMIND DESIGN USEFUL?

Supermind Design can be useful when you want to generate innovative possibilities for systems with interacting parts, especially groups of people and computers. Supermind Design can be used by individuals or by in-person or online groups.

HOW DOES SUPERMIND DESIGN RELATE TO OTHER KINDS OF DESIGN?

Supermind Design is one of many design approaches, including design thinking, agile design, participatory design, and others. Supermind Design has similarities with, and can be combined with, many of these other methods. But Supermind Design focuses specifically on helping you generate innovative ideas about how to configure superminds—especially systems of people and computers.

WHAT ARE THE STAGES OF SUPERMIND DESIGN?

Like any kind of design, Supermind Design can be thought of as having three main stages:

- **Defining the problem**
- **Generating ideas**
- **Evaluating ideas**

The moves in Supermind Design are used in the first two stages.

* Malone, T. W. (2018). *Supyerminds: The Surprising Power of People and Computers Thinking Together.* New York: Little Brown, p. 20.
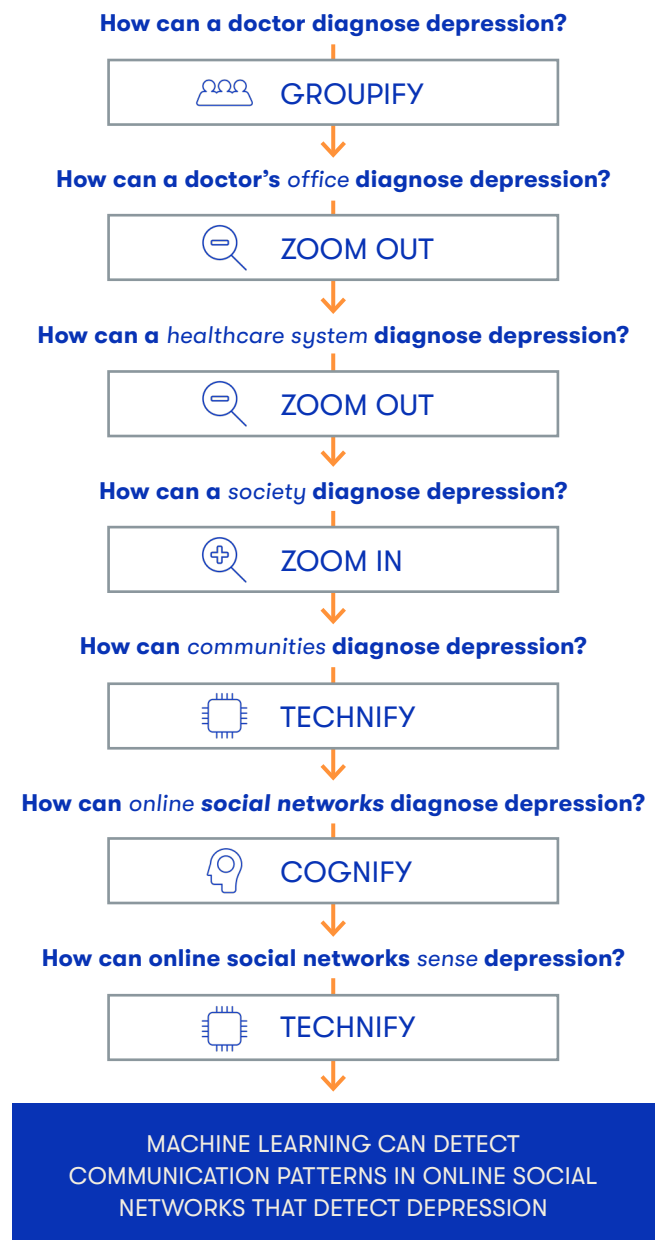
How does Supermind Design work?

In Supermind Design, you generate and evaluate ideas about how to define and solve problems. The moves help you generate new ideas by going from one idea to the next, sometimes in surprising ways.

For example, here's a simplified example of a sequence of ideas about the problem of developing innovative solutions to tackle depression in Japan.* Starting with the problem of how a doctor can diagnose depression, the sequence of moves eventually arrives at a novel idea for dealing with depression: using machine learning to recognize signs of depression in how someone communicates on social networks.

Note that this example shows only one sequence of ideas and moves. But usually you should generate dozens or hundreds of possibilities by considering many possible ideas and many possible moves at each step.

In general, you should think of as many ideas as you can, and whenever you're stuck, pick a move and use it to think of more ideas.

From time to time, you'll also have to evaluate the ideas you've generated to select ones that are worthy of further attention.

How can a doctor diagnose depression?

GROUPIFY

How can a doctor's *office* diagnose depression?

ZOOM OUT

How can a *healthcare system* diagnose depression?

ZOOM OUT

How can a *society* diagnose depression?

ZOOM IN

How can *communities* diagnose depression?

TECHNIFY

How can *online social networks* diagnose depression?

COGNIFY

How can online social networks *sense* depression?

TECHNIFY

MACHINE LEARNING CAN DETECT COMMUNICATION PATTERNS IN ONLINE SOCIAL NETWORKS THAT DETECT DEPRESSION

* https://news.mit.edu/2020/tackling-depression-in-japan-mit-takeda-superminds-collaboration-0204.

What are the moves in Supermind Design?

The Supermind Design moves are classified in two groups, and the following pages describe each move in more detail:
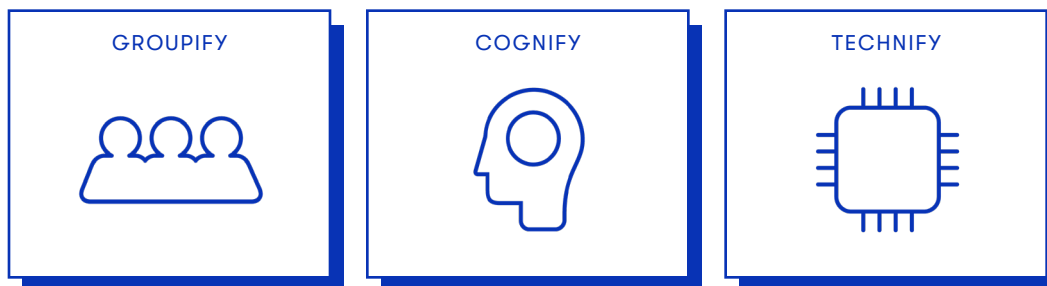
Basic design moves

(useful for designing anything, similar to many other design methods)

ZOOM OUT	ZOOM IN	ANALOGIZE
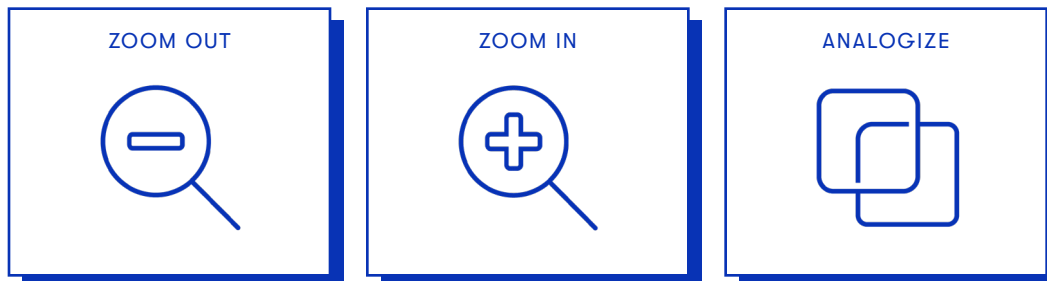
Supermind Design moves

(especially useful for designing superminds)

GROUPIFY	COGNIFY	TECHNIFY

ZOOM OUT

What is the bigger picture?
What is a more general idea?

EXAMPLES   Stocking shelves **>** Selling groceries **>** Selling **>** Making money

Place "help wanted" ad **>** Hire employee

WHY USE IT   Helps you step back to discover new ways of defining the problem, to unlock new ideas. Helps you think of the problem at a higher level or generalize the problem. Often helps you find that the real problem isn't what you thought it was.

HOW TO USE IT   Think of the larger ideas of which this is a *part* (e.g., "Stocking shelves" is part of "Selling groceries")

Think of *generalizations* of this idea (e.g., a generalization of "Selling groceries" is "Selling")

ZOOM IN

What are the parts or types of this idea?

EXAMPLES
(The opposite of zoom out)

Sell food **>** sell food from a truck **>** sell ice cream from a truck **>** advertise ice cream for sale

WHY USE IT
Can help you identify key leverage points in solving the problem or trigger more concrete ideas. Sometimes a higher level of abstraction is too generic to be solved practically.

HOW TO USE IT
Think of the *parts* of the problem (e.g., "Advertising" is part of "Selling")

Think of the *types* of the problem or *ways* of solving it (e.g., "Selling food from a truck" is one way of "Selling food")
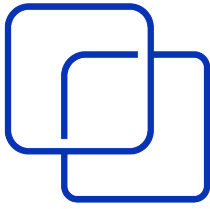
ANALOGIZE

What are analogies for this idea?

EXAMPLES

Sell dog-walking services **>** Create the "Uber" of dog-walking

Form project teams **>** Create a "Match.com" of team formation

Traditional automobile design **>** Automobile design that uses rapid product development techniques like those used by daily newspapers

WHY USE IT

Prompts more creative ideas by thinking about situations that have some similarities to the current idea but may be very different in other ways.

Distant analogies (e.g., to completely different industries or processes) are more likely to lead to innovative ideas than analogies to very similar situations (e.g., best practices in the same industry).

HOW TO USE IT

First think of generalizations of your original idea (e.g., Zoom out from "automobile design" to "product design" in general)

Then think of other types of these general ideas (e.g., Zoom in from "product design" to "product design for daily newspapers")

GROUPIFY

What kinds of groups (or superminds) could achieve this goal?

EXAMPLES

Team leader decides (hierarchy) **>**
Team votes (democracy)

Corporate HR decides who will staff projects (hierarchy) **>**
Internal market matches employees to projects (market)

WHY USE IT

Systematically explores different ways of organizing activities.

HOW TO USE IT

Think of how groups could do things currently done by individuals

Look at the five types of superminds* in the diagram to the right and consider how variations of each of them could be used in your situation.

Hierarchies
Where group decisions are made by delegating them to individuals in the group.

Democracies
Where group decisions are made by voting.

Markets
Where group decisions are the sum of all the pairwise agreements between individual buyers and sellers.

Communities
Where group decisions are made by a kind of informal consensus based on shared norms and reputations.

Ecosystems
Where group decisions are made by the law of the jungle (whoever has the most power gets what they want (and the survival of the fittest.

* See detailed descriptions of these Supermind types in Malone, *Superminds*, Ch. 6 – 11.

COGNIFY

What cognitive processes are needed to achieve this goal?

EXAMPLES   Diagnose depression **>** *Sense* symptoms that indicate depression

Sell consulting engagement **>** *Decide* what fee structure to propose
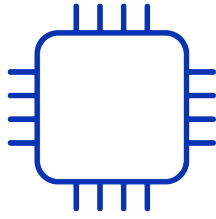
WHY USE IT   Systematically focuses on different parts of intelligent behavior one at a time. Each one may trigger specific ideas or analogies for solving the larger problem.

HOW TO USE IT   Look at the five cognitive processes in the diagram* below and identify where they apply in your problem or solution.

Then use other moves to generate ideas about how these processes could be done.
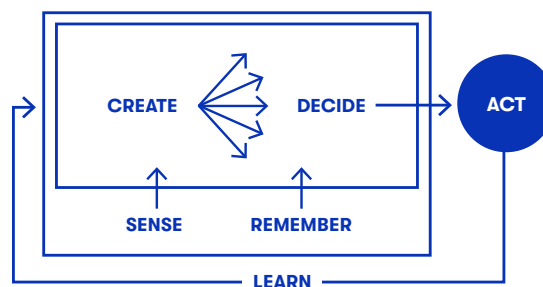
To take any action, you need to **Decide** what action to take. In order to do that, you need to **Create** options for action. To do better Deciding and Creating, you need to **Sense** the world and **Remember** the past. And over time, you can **Learn** to do all these things better and better.

* Diagram adapted from Malone, *Superminds*, p. 82. Used by permission.

TECHNIFY

How could technologies help achieve this goal?

EXAMPLES

Manager assigns people to task **>** algorithm assigns people to tasks (automated decision)

Make group decision **>** make group decision using online voting

WHY USE IT

Explores how technologies can be helpful.

HOW TO USE IT

Consider various types of technologies and imagine they could help solve your problem

Digital technologies are often of special interest. For instance, look to the right at the four main roles computers can play in a supermind* and think of how computers could be used in these ways in your situation.

Tools
Computer tools do things better, faster, or cheaper than humans could alone, but humans are expected to remain in control at all times (e.g. word processor, spreadsheets)

Assistants
Computer assistants work without always requiring direct human attention and may take initiative (e.g. spelling correction algorithms)

Peers
Some computer programs interact with humans as peers (e.g., bots that handle simple transactions themselves and refer others to their human peers)

Managers
Automated managers delegate tasks, give directions, evaluate work and coordinate efforts (e.g. routing calls to workers in a telephone call center)

* See Malone, *Superminds*, pp. 49 - 57.

Tips for using Supermind Design

- **If you already know about design thinking or other design approaches, feel free to mix techniques from Supermind Design with those from other approaches.**

- **It's usually a good idea to:**
  Spend time defining your problem before becoming fixated on a particular solution ("Fall in love with the problem, not the solution").

  Use well-established rules of brainstorming to generate options:
  - Defer judgement
  - Encourage wild ideas
  - Build on the ideas of others
  - Go for quantity of ideas

- **Alternate phases of generating and evaluating**
  - Diverge to generate many possibilities
  - Converge to identify the most promising ones
  - Repeat

- **Don't worry about classifying all your thoughts into Supermind Design moves.**
  - If an idea comes to you, take it!
  - But if your creativity runs out of steam, then pick a move and see what new ideas it triggers for you.

- **Don't worry about not using all the moves.**
  - The goal of Supermind Design is to come up with good ideas, not to use all the moves.
  - If some of the moves work better for you than others, use them!

- **There are many ways to evaluate ideas, including:**
  - Asking yourself and others what they think about the ideas
  - Trying out the ideas in simple form (prototyping)
  - Systematically rating a set of ideas on key dimensions (like time, cost, and quality)