

## About Cognitive Maps

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### What Are Cognitive Maps?

The term, “cognitive map,” has various meanings. Some limit it to representations of the physical or spatial. Others restrict it to social matters. We use the term broadly to stand for what the idea of a “theory”—a Principled Developmental-stage notion—develops into at the Perspectivist Developmental-stage. The comparison between theory and cognitive map is explained below under the heading, “Cognitive Maps and Developmental Stages.”

The word “cognitive” means “related to knowing, thinking, or inquiry.” Therefore “cognitive maps” are literally just “thinking maps” or mental or conceptual models. They are, metaphorically, analogous to geographic maps, but of cognitive “territory” instead of geographical territory.

Geographic maps display the location of geographic features: mountains, valleys, rivers, lakes, and so on. They also show the spatial relationships among them: a river rising in the mountains and flowing into a lake, for example. Such maps reveal the lay of the land and enable you to locate where you are, where you want to go, and how to get there. They are useful for making a journey or for finding your way around. Of course, there are many other kinds of maps besides geographic ones: maps of population, economics, weather, and others.

Cognitive maps are more abstract, but perform similar functions for concepts. A cognitive map is an organized set of ideas about some conceptual area, called

a “cognitive territory” or “domain.” This means any conceptual area, large or small, such as mathematics, management, conflict resolution, interpersonal relationships, communication, or riding a bike.

## Content of Cognitive Maps

Cognitive maps can include a wide variety of cognitive content—the “features” or “elements” of a map, often described within the map. Here are typical ones:

- Preliminaries or prerequisites for using the map
- Carefully selected terminology
- Distinctions, differences, ways of differentiating
- Characterizations, characteristic properties or behaviors
- Categories
  
- Frames
- Stances, postures
  
- Criteria or other factors for evaluation
- Heuristics
- Steps of a process
  
- Perceptions
- Ideas, ways of thinking
- Values
- Purposes: aims, goals, problems, decisions
- Behaviors, actions, activities

Maps can range from extremely fundamental, theoretical, abstract, or general to extremely applied, practical, concrete, or specific. They can be of varying degrees of sophistication. They can also vary greatly in quality. (Please see the next paper in this section of the website.)

## Forms of Cognitive Maps

Cognitive maps take many forms. The form is the way the content-elements are related to each other. It organizes them into a kind of conceptual picture of a domain. The form can either be described in text or displayed as a list, table, matrix, graph, diagram, picture, or any visual representation of these relationships.

The kinds of relationships among elements often include the following:

- Identity, similarity, difference, oppositeness
- Comparisons
  
- Connections
- Derivations
- Progressions
- Patterns
  
- Causal
  
- Inductive
- Deductive
- Abductive (see map on “Induction, Deduction, Abduction”)

## Examples of Cognitive Maps

Here are some cognitive maps we have developed. The first six kinds are “Whats,” meaning that they are maps of what something is. The seventh kind is “How,” meaning maps of how to do something. The last kind is “How Well,” meaning maps that evaluate how well something is being done or how good it is.

- Ways of construing (“What”)
  - Organizations as vehicles for connecting providers to recipients of goods or services
- Requirements to construe (characteristic properties): the Perspectivist-stage version of “definition” in the Principled stage (“What”)
  - Systems, closed systems, open systems
  - Holonarchies
  - Organizations (their necessary fundamentals)
- Ways of framing or reframing (“What”)
  - Conflict resolution as joint problem-solving
  - Decision analysis
  - Purpose as an element of a set which is the intersection of the desires of its Object with the ability, willingness, and effort of its Subject
- Ways to understand (“What”)
  - Developmental regression as consequence of challenge exceeding skill
  - Many threads through the Holonarchy of Developmental Stages
  - Root dilemma for managers and the implicit management contract
  - Overall aims of line departments in most companies
  - Benefit, value, liability, risk, confidence level, return on investment
  - Worth of planning
- Categorization schemes, often as holonarchies (“What”)
  - Holonarchy of Developmental Stages
  - Five Modes of Functioning
  - Knowledge, skill, development
  - End-Result Variables
  - Types of information & communication problems in organizations
  - Comprehensive Map of Management
  - Three modes of managing: coach, advise, assist

- Choosing the right form (“What”)
  - Three forms of Purpose: goal, problem, decision
  - Which media to use for which types of communication
  
- Methods and procedures (“How”)
  - How to choose the right cognitive map
  - How to use a cognitive map
  - Induction, deduction, abduction
  - Five phases of work
  - How to design a purpose or plan
  - Four steps of Purpose: definition, planning, implementation, feedback
  - Planning and achieving goals or aims
  - Identifying and solving problems
  - Making sound decisions
  - Meetings
  - Overload
  - Recruiting
  
- Sets of criteria or quality factors for evaluation (“How Well”)
  - Cognitive maps themselves
  - Information and communication
  - Feedback
  - Self expression
  - Understanding others
  - Purposes
  - Likelihood and degree of success in achieving a purpose
  - Determinants of a Subject’s potential to achieve a purpose
  - Organizational design and structure
  - Effectiveness of meetings

## How People Use Cognitive Maps

When we think about a domain, we pull out our cognitive map of that territory and use it to find our way around. Our maps help us understand the domain or cognitive territory. They organize our understanding of the domain—sorting, arranging, and classifying our ideas about it.

We use our maps to “locate” the problem or idea we’re working on within that domain. We go on to find a spot on the map—perhaps not yet filled in—that we want to understand better. We see on the map how to get from where we are at present to where we want to go, by following some paths of reasoning from point to point. The map serves as a guide for our learning. It also reveals points of interest as we go, draws our attention to related ideas along the way, illuminates the cognitive territory, helps us get clear, and enables us to master it.

When we are aware of our maps in the process of using them, we realize the assumptions, definitions, models, reasoning, and other cognitive features that we are taking for granted in our mental process. This perspective enables us to evaluate the quality of maps themselves and to improve them. This is very important, because our maps greatly influence and affect our perceptions, thinking, values, desires, and behavior. As we improve our maps, we improve our thinking, which leads to improvements in all these other functions as well.

## Applications of Cognitive Maps

Let us call the one who will use the map the “Observer” and the reason for the map the “Observer’s Purpose.” Let us call the thing, conceptual area, domain, or situation that the Observer wants to map the “Territory.”

Hence, we say that an Observer maps a Territory for a Purpose. Like any other Purpose, it can be analyzed or categorized into one of three Forms: goal, problem, or decision. That is to say, the Observer is using the map either to achieve a goal, to solve a problem, or to make a decision.

Using a different scheme of categories, the Purpose can also be analyzed within one of the Five Modes of Functioning: perceptual, cognitive, evaluative, volitional, or behavioral. Here are some typical uses in each of these Five Modes:

1. Perceptual
  - a. Inquiring, investigating, gathering data or information
  - b. Noticing, attending to, becoming aware of
  - c. Differentiating, distinguishing, discriminating
2. Cognitive
  - a. Organizing data, sorting, chunking, finding patterns and relationships
  - b. Interpreting data, understanding it, making sense of it, what it means
  - c. Analyzing data, reasoning about it
  - d. Troubleshooting, diagnosing
  - e. Drawing conclusions
  - f. Framing, reframing
  - g. Illuminating, insights, clarity
  - h. Estimating probability, confidence levels, degrees of certainty
  - i. Generating more cognitive maps
3. Evaluative
  - a. Evaluating, assessing, judging anything
  - b. Evaluating performance, effectiveness, success (relative to a Purpose)
  - c. Predicting likelihood and degree of future success
  - d. Assigning importance, urgency, priority
  - e. Providing feedback, including monitoring and measuring progress
4. Volitional
  - a. Identifying desires
  - b. Defining or clarifying purposes
  - c. Planning
5. Behavioral
  - a. Acting, behaving, performing (relative to a Purpose)
  - b. Implementing a plan (performance relative to a Purpose)
  - c. Communicating

- d. Learning knowledge
- e. Building or improving skills
- f. Developing

## Cognitive Maps and Developmental Stages

The whole idea of cognitive maps belongs in the Perspectivist Developmental-stage. What theories are to the Principled stage, cognitive maps are to the Perspectivist stage.

In the Principled Developmental-stage, theories are supposed to be true and consistent explanations of something: phenomena, human behavior, language—anything. They induce principles from evidence and deduce their explanations from foundations whose accuracy is believed to be reliable. One “subscribes” to a particular theory about something. For example, someone may have adopted Aristotle’s or Kant’s theory of ethics, but probably not both.

By contrast, cognitive maps do not pretend to be explanations of anything. Instead, good cognitive maps aim to be high-quality ways of understanding things for particular purposes. They do not claim to be completely consistent—only coherent (hang together and make sense). They do not pretend to be true—only of good quality and appropriate for some use. They do not rely on some foundation which is itself assumed to be true; instead, they make use of other relevant cognitive maps. The test of their quality is not whether or not they can be proven, but rather their scope, simplicity, coherence, sophistication, and value in practice. (See the next paper in this section.) One needn’t “subscribe” to any particular map, but is free to use whichever maps are suitable to the purpose at hand, and to switch to different ones as needed. All these characteristics are typical of the Perspectivist Developmental-stage.



## Methods for Using Cognitive Maps versus Theories

An Observer uses a cognitive map in a Perspectivist-stage way as follows:

- Studying the Territory (with potentially suitable maps in back of mind)
- Defining his/her purpose. (Even though the Observer will have some notion of possible purposes before studying the Territory, the purpose will not be clearly specified and defined until after step 1.)
- Designing, modifying, or selecting an optimal map
- Applying (or fitting) the map to the Territory (this takes skill)
- Using the map for the purpose

This method is often performed recursively. For example, the Observer may cycle back to study the Territory further after making a tentative first choice of a map. Learning more about the Territory may, in turn, change the choice of map.

This is very different from how theories are used in the Principled stage:

- Studying the theory that is judged to be the true description or explanation for all situations like the Territory
- The purpose is pretty well implied by or circumscribed by the theory. It mainly amounts to bringing the Territory in line with the theory. Then, it is assumed, all will be well.
- Applying the theory to the Territory
- Understanding the Territory as phenomena explained by the theory. Applying the theory's evaluations, predictions, or plans, to the Territory.

The way theories are supposed to be generated—"scientific method"—is problematic. One should construct a hypothesis, gather evidence to support or refute it, and so conclude whether it is true or false. In practice, however, it is remarkable how often the evidence that happens to turn up just happens to

corroborate the hypothesis, whereas other evidence would have suggested the opposite. Somehow, the theory manages to survive, despite the evidence. It often seems that facts are massaged—if not falsified outright—to fit the theory.

Another disturbing problem with theories is how often one theory disagrees with or flatly contradicts another. They can't both be true. What is one to think? In such situations, people take sides and “subscribe” to one theory or the other.

No such dilemmas crop up in the more sophisticated arena of cognitive maps.

## The Cognitive Maps in This Section of the Website

We make heavy use of many Perspectivist-stage cognitive maps in our work. We find this to be essential, because many management and organization problems are very complex—especially ones that consultants are called in to help with. The level of complexity of these problems often requires Perspectivist-stage approaches and solutions. Less-developed methods will either be completely ineffective or result in only marginally-acceptable solutions.

This section of the website gives brief descriptions of some of the maps we use, including where the map comes from, how it relates to other maps or disciplines, some of its uses and applications, and what alternative maps are used in its domains.

A full treatment of many of these maps would have to be book-length. (Think of the full exposition of a serious theory, for example.) Still, even these brief descriptions of maps should reveal a good deal about us and how we work. More importantly, they are there as a reference for our clients to use as we work with them, or when they're working alone.

We believe these maps are of very high quality (see the next paper in this section of the website) and can be of great usefulness to managers and their organizations in applications such as the following:

- Understanding an organization or group and how it functions
- Evaluating performance of individuals and groups
- Predicting likelihood and degree of success in achieving a purpose

- Identifying desirable improvements
- Determining the best methods for making these improvements
- Providing feedback to monitor, track, or measure progress

Please see the next paper, “Tests of the Value of a Cognitive Map,” for a practical guide to determining the quality of any cognitive map.

**Your comments and questions would be most welcome.** We’d be very interested to hear how you liked this paper, whether you found it to be valuable, or any other reactions. We’d also be happy to answer any questions you might have or discuss the ideas in this paper or how they apply to your management or organizational interests. Please e-mail us at [info@developmentalconsulting.com](mailto:info@developmentalconsulting.com) or call (303) 468-1510. This paper is from our website, [www.developmentalconsulting.com](http://www.developmentalconsulting.com).

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