Mindforming™

AI-Enhanced Ideation for the 21st Century

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2026

6.1 Brainstorming and Its Discontents

Since 70 percent of corporations use brainstorming as their primary ideation method, it has naturally attracted the attention of researchers, skeptics, and critics alike. Many researchers and critics regard brainstorming as a specialized form of corporate meeting that inherits familiar shortcomings: production blocking, topic fixation, social inhibition, social loafing, groupthink, and dominant participants.

Alex Osborn, the originator of brainstorming, claimed that his method generates 50 percent more or better ideas than individuals working independently. If this were true, it would be extraordinary. Unfortunately, it is not. A landmark study conducted in 1958 by psychology professor Donald Taylor and graduate students Paul C. Berry and Clifford H. Block at Yale University concluded the opposite.

In an experiment funded by the Office of Naval Research, researchers divided 96 Yale students into two groups of 48. The first group was split into 12 brainstorming teams of four, while the second group worked individually. The students in the brainstorming teams knew each other well and had previously collaborated on group projects. All participants were familiar with the brainstorming method, having taken part in such sessions before. Both groups were given one hour to solve three problems deemed suitable for brainstorming.

At the end of the hour, the answers from the 48 individual students were combined into 12 "nominal" four-person teams for comparison with the actual brainstorming teams. The researchers then evaluated the average output of the brainstorming teams against that of the nominal teams. The results were clear: students working alone outperformed the brainstorming teams by a significant margin, both in the quantity and originality of ideas generated.

Subsequent studies confirmed the findings of the Yale researchers. A meta-analysis of 50 studies conducted by Dr. Scott G. Isaksen of the Norwegian School of Management attributes brainstorming's poor performance to the group nature of the sessions rather than Osborn's methodology. His argument is supported by improvements observed when participants communicate remotely rather than face-to-face.

Further evidence comes from a meta-analysis by Darleen M. DeRosa, Carter L. Smith, and Donald A. Hantula, published in *Computers in Human Behavior* (2003). It concluded that online brainstorming generates more and higher-quality ideas than in-person sessions. The improved performance likely stems from the elimination of

production blocking (one person monopolizing the session) and reduced influence of other adverse social effects inherent in face-to-face brainstorming. However, even in online settings, individuals working alone consistently outperformed brainstorming groups. The root cause likely lies elsewhere.

If the Osborn method has been shown to underperform individuals, why do 70 percent of companies still rely on it? Kevin Byron of the University of London offers some insights. First, he highlights a strong natural desire for people to meet, engage in creative activities, and socialize. Brainstorming provides a break from the daily routine and offers an activity universally perceived as enjoyable.

Byron also identifies the "Illusion of Productivity," the belief that working together will lead to more and better ideas than working alone. This belief seems credible at face value: after all, teams bring diverse skills and expertise. How could that be bad? Without detailed analysis, it appears plausible.

Additionally, group brainstorming provides employees with a rare opportunity to stand out. Solving critical problems, identifying new customer needs, or uncovering opportunities are high-impact activities. Being part of the organization's success story can be deeply rewarding.

6.2 Why Brainstorming Fails

To uncover the reasons behind brainstorming failure, we must examine three factors: the degree of compliance with Osborn's methodology, the age of the method, and recent advancements in our understanding of the brain.

6.2.1 Compliance with Osborn's Methodology

As we saw in the previous chapter, brainstorming involves much more than enforcing the Four Rules. To assess compliance with Osborn's method, consider the following self-assessment questions, grouped by category:

Resources

- Is adequate funding available for implementing solutions?
- Is financing proportionate to the scale of the problem?
- Are sufficient resources in place to record ideas (e.g., note-taker, document writer, idea bin, or video capture)?

Participants

- Are the most qualified individuals selected to participate?
- Are participants appropriately matched to the problem's domain?
- Are they familiar with basic ideation concepts such as Incubation, Illumination, and Osborn's brainstorming tenets?
- Is at least one knowledgeable subject matter expert (SME) included?

Preparation

- Are brainstorming memos carefully prepared?
- Do participants receive enough background information in advance to develop a mental model of the problem?
- Are participants encouraged or incentivized to prepare prior to the session?

Facilitation

- Is the session led by a qualified brainstorming facilitator?

Follow-up

- Does ideation continue after the session through organized Supplementation?
- Are participants encouraged to submit additional ideas afterward?
- Is a comprehensive session report prepared and circulated to all participants, not just problem owners?
- Are outcomes reviewed for intellectual property (IP) and other organizational implications?

If the majority of these questions are answered "no," your brainstorming session may be functioning more as an informal gathering than as a structured innovation process.

6.2.2 Inherent Obsolescence

Much has changed since the early 1950s, when Osborn introduced his brainstorming method. At that time, most enterprises were reasonably well-informed about the technologies and markets relevant to their trade. Today, by contrast, the world is saturated with more than 100 zettabytes of data, much of it accessible through digital networks. Embedded in this ocean of information are leading-edge advances, such as autonomous robotic systems, quantum sensors, and AI-driven decision-making. Few have expertise in these emerging fields. Professionals increasingly specialize in much narrower domains, reflecting the growing complexity of knowledge.

This raises a critical issue for brainstorming: who should be invited to participate? Problem owners are natural candidates, yet their closeness to the issue often constrains them to incremental improvements. To select participants rationally, facilitators must first identify which fields of knowledge are most likely to yield solutions and then determine who within those fields has the skills and experience to contribute. Osborn offered little guidance here. In the consumer advertising industry where he worked, participants typically knew how to use the products they were promoting or could learn quickly. That assumption rarely holds today.

Consider two examples. A small toy company hoping to expand customer engagement through AI chatbots cannot rely solely on internal expertise; it must reach into the AI domain. Likewise, a medical research institute exploring quantum computing for cancer drug discovery would need external specialists. In both cases, prior knowledge of which domains might contain the solution is essential. Without it, the brainstorming team may never reach beyond its own boundaries.

6.2.3 Brainstorming Ignores Neuroscience

Osborn suggested distributing pre-session memos one or two days before a brainstorming session. While this might suffice when the team shares the same background and understands the problem, it is inadequate when a learning curve is involved. Teams may need additional time to gain a working knowledge of new concepts, technologies, or principles.

Osborn also recommended that brainstorming sessions last only 30 to 45 minutes. For an ideal team size of twelve, this translates to less than four minutes per participant, insufficient in today's context. In practice, two-hour sessions are the minimum for problems of low to moderate difficulty, while more challenging problems may require half a day or more.

Additionally, brainstorming provides no structured Incubation period. Instead, it focuses on rapidly generating and recording ideas. Although evaluation is discouraged during the session, certain ideas are inevitably chosen for further development based on the facilitator's or participants' intuition. In specialized fields like quantum computing or AI, intuition may not suffice.

Without significant Incubation, brainstorming sessions are limited to two outcomes: identifying a solution from the team's combined experiences or synthesizing one from idea fragments (combinatorial innovation).

As a result, a brainstorming session often functions as an information exchange exercise, which may still be effective in some cases. However, as noted earlier, social dynamics frequently undermine its efficiency.

Participants often continue integrating new knowledge after the session, during a Supplementation phase lasting one to two days. Beyond that period, the acquired knowledge decays unless reinforced. Osborn viewed Supplementation as idea consolidation rather than a fresh ideation opportunity.

The time constraints that characterize brainstorming are particularly problematic in complex scenarios involving advanced technologies or interconnected social systems. Building a detailed, integrated World Model that incorporates new components and their interactions requires substantial effort. For example, a clothing manufacturer adopting sensor-laced fabrics or a wooden toy maker transitioning to online gaming would need to master entirely new domains. As discussed in earlier chapters, this can be a long and arduous process.

6.2.4 Transitioning to Mindforming

Mindforming becomes essential when brainstorming cannot solve a problem, address a need, or exploit an opportunity. The reasons vary: the problem may be too complex for a single session, or the organization may lack the necessary knowledge.

This realization may arise from a failed brainstorming session or through an honest assessment of the organization's capabilities. Recognizing these limits is the first step toward expanding them, which is the essence of Mindforming. Going forward, we will assume we are addressing a difficult problem rather than a need or opportunity. As we saw earlier, there are methods of converting needs and opportunities into problems.

6.3 Overview of Mindforming

At the core of human adaptability lies our capacity to construct and refine complex mental representations of the world. These representations, encoded in billions of synaptic connections, allow us to anticipate dangers and recognize opportunities. We call this synaptic network the *mind*, and its current configuration our World Model: an internal map that reflects external reality.

6.3.1 What is Mindforming?

Mindforming is the process of developing, maintaining, and updating one's model of the world. It can be broadly categorized as either developmental or learned (Figure 6.1).

6.3.2 Developmental Mindforming

Developmental Mindforming describes the brain's natural evolution from the womb through biological adulthood. It involves wiring sensory and motor systems and gradually modeling one's environment with increasing accuracy. While relatively stable in adulthood, the World Model may still be reshaped by major life events, injuries, or illness.

6.3.3 Learned Mindforming

Learned Mindforming occurs through direct experience or guidance from trusted agents such as parents, educators, or other institutions. It can be divided into involuntary and deliberate forms.

6.3.4 Involuntary Mindforming

Involuntary Mindforming occurs when our World Model is shaped by experiences, information, or influences beyond our conscious control, or by assumptions we accept without critical examination. Parenting and education also fall into this category, as they are largely structured by societal frameworks.

6.3.5 Deliberate Mindforming

Deliberate Mindforming refers to intentionally shaping our World Model in a direction of our choosing. Examples include selecting a career path, choosing a life partner, and deciding where and how to live. These decisions contribute to personal development, often informed by the experiences of others on similar paths.

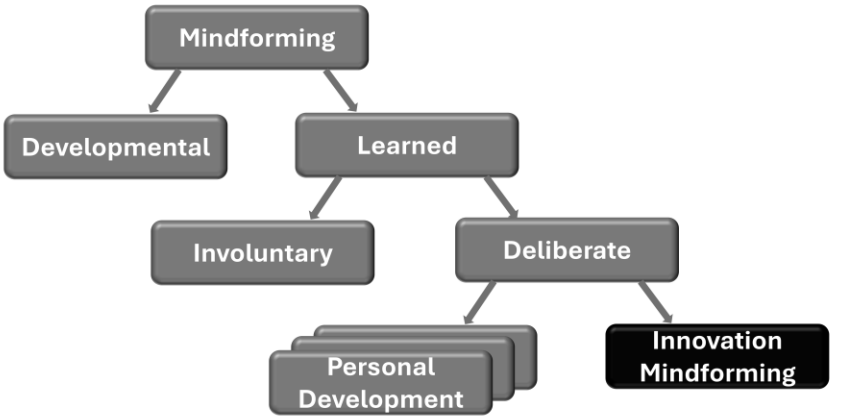


Figure 6.1 – Mindforming Hierarchy

6.3.6 Innovation Mindforming

Innovation often unfolds in contexts where foresight is limited, and traditional brainstorming alone proves insufficient. **Innovation Mindforming** addresses this challenge by structuring the ideation process into three iterative phases:

1. **Identify search areas:** Determine the domains where potential solutions are most likely to emerge.
2. **Build Knowledge Islands:** Expand expertise in those domains through targeted research, training, or exploration.
3. **Develop solutions:** Apply simulations on the enriched World Model to generate and refine solutions.

These phases are bookended by two brainstorming stages. The first is an early stage, during which all immediately derivable solutions (simulations on the current World Model) are uncovered, then archived for later use. The second is a late stage, during which the ideas provided by simulations on the expanded World Model are combined with the solutions archived earlier.

In practice, Innovation Mindforming consists of alternating group meetings and intersessions. Group meetings, lasting from a few hours to a full day, focus on exchanging knowledge and brainstorming. Intersessions, typically lasting one to three weeks, allow participants to pursue training, conduct research, and engage in individual ideation, activities supported by their peer network.

Figure 6.2 illustrates the stages and decision points in the Mindforming process.

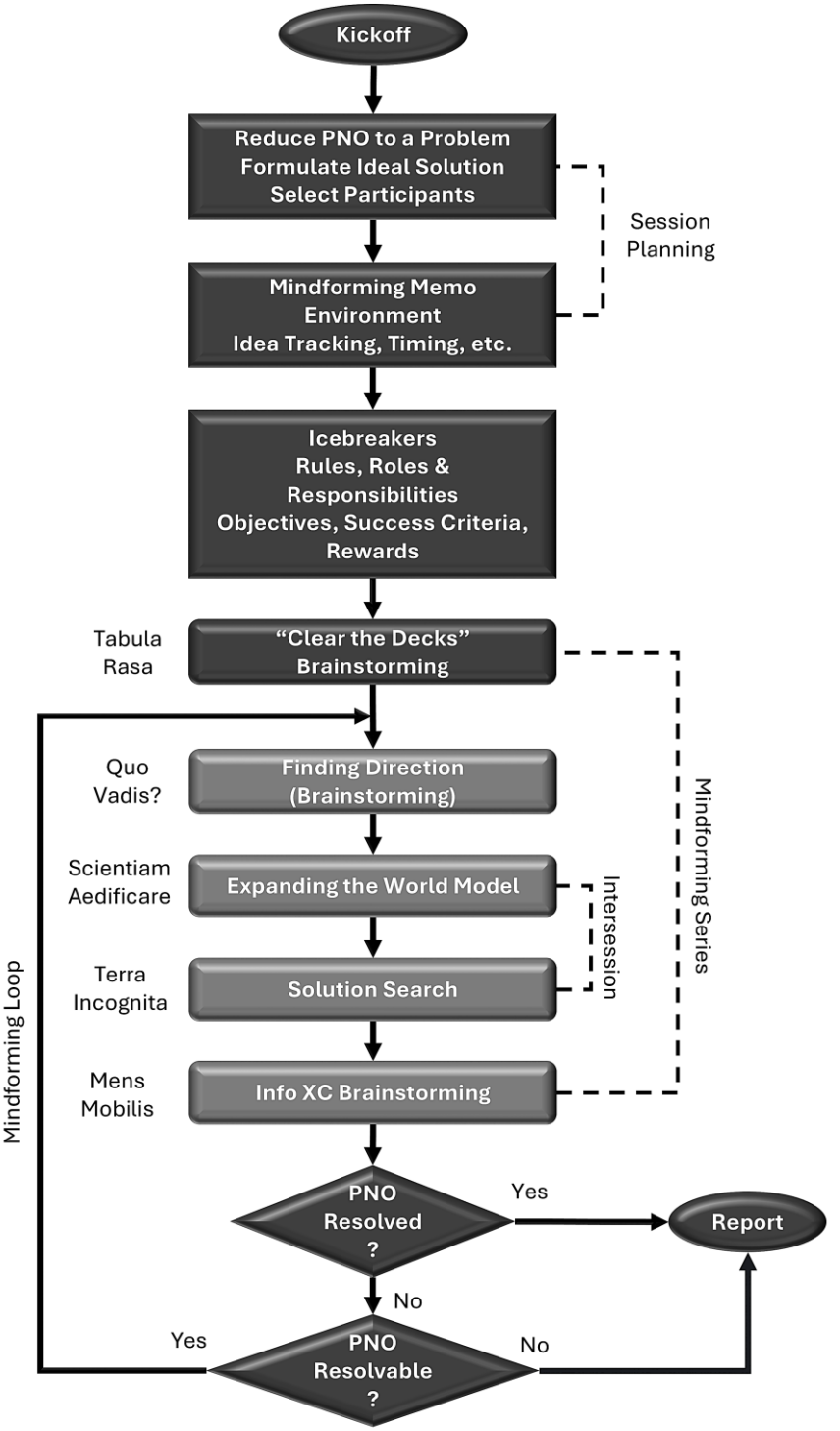


Figure 6.2 – Innovation Mindforming Process

The process is iterative. It continues until a successful resolution is achieved or the search is abandoned. It is important to note that even a failure in Mindforming is a positive outcome. Such a failure may indicate that the problem's complexity or knowledge requirements exceed what conventional brainstorming could reasonably address.

The fundamental difference between Mindforming and brainstorming is illustrated in Figure 6.3.



Figure 6.3 - Brainstorming vs. Mindforming