Super Charging Your Brainstorm – The Torrent Brainstorm

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August 27, 2012

Creativity on demand and scheduled inventions are a reality for many companies and the life-blood for some. The traditional brainstorm attributed to Osborn [Osborn, 1953] is a practice used by many industries and companies to try to solve problems and innovate. However, the brainstorm has been under attack nearly from its inception starting with the Yale study [Taylor, Berry & Block, 1958] and continuing with a myriad of follow up articles and studies including a scathing critique by Adrian Furnham [Furnham, 2000] and more recently with an article in the New Yorker by Jonah Lehrer [Lehrer, 2012]. Personally, I have walked out of many brainstorms with a fist full of sketched ideas but feeling like I am no closer to a viable solution. A common problem is that when I start to look at implementing some of the ideas they buckle under closer scrutiny, calculation and scale. The traditional group brainstorm is often used as a high level ideation engine which it is poorly suited for instead of group interrogation, criticism and hybridization, i.e., problem solving. In this article I will propose a method to make brainstorms more useful for engineering problems by offloading the ideation to a group proven to be better suited to this aspect and using the high cost brainstorm session as a refinement and scrutiny venue.

The aforementioned Taylor study and the majority of the litany of follow-up studies are generally simplistic in their treatment and although certain claims may be true for simple problems, complex multi-disciplinary problems are likely to benefit from a well-run group brainstorm. The general metric used to justify the criticism stems from research indicating that individual brainstormers outperform group brainstorms in number of ideas generated. As Isaksen points out in his literature review [Isaksen, 1998], individual vs. group ideation output magnitude is an incomplete metric as the quality of the ideas and whether the brainstorm produces superior ideation in a group environment is not captured. It is not surprising that individual ideation generates superior numbers of ideas than group ideation for simplistic problems. The distractions in a group environment are undoubtedly a factor in this type of comparison. Some problems are complex and demand a group to solve the issue. In this case, it is my submission that a traditional brainstorm is not without its merits; however, a traditional brainstorm could use a little help and some aspects of the criticism should not be ignored. The question is, how can we improve the process?

Let's briefly re-visit Osborn's description of brainstorming. Osborn had 4 tenets:

1. Criticism is ruled out. Adverse judgment of ideas must be withheld until later. The purpose of the brainstorming session is the generation of many, varied and unusual options.
2. Freewheeling is welcomed. The wilder the idea, the better; it is easier to tame down than to think up. Since criticism is temporarily ruled out, it's acceptable and desired that really wild and unusual ideas are shared.

3. Quantity is wanted. The greater the number of ideas, the greater the likelihood of useful ideas.
4. Combination and improvement are sought. In addition to contributing ideas of their own, participants should suggest how the ideas of others can be turned into better ideas; or how two or more ideas can be joined into still another idea.

As Isaksen [Isaksen, 1998] points out, Olson's "deferment of judgement" was a central principal; he made it clear that judgment had an important role in the overall creative problem solving process. Criticism, sorting and evaluation was the domain of another session.

Olson also advocated:

- A Trained facilitator
- Individual ideation was to precede the group session and follow afterwards.
- The problem was prepared carefully for the group and participants oriented prior to the session
- Clear focused problem outlined with a one page background and a few sketched examples
- Participants trained
- Complementary tools

Intuitively, the brainstorm is most productive, although potentially inefficient, for raw idea generation when a large group of people are utilized. A diverse participant group maximizes the range and obscurity of the ideas generated. Countering the push to diversify and expand the brainstorm group is the fact that large and diverse groups can have negative repercussions. The most obvious is the cost associated with a large group. The raw time in man-hours, as well as the logistics and resulting disturbance to the company is not trivial. Large group discussions also degenerate into fragmented and unstructured conversation without strong leadership and protocols. Lastly, those individuals with skills and backgrounds distal from the core problem can quickly run out of ideas and stray the ensuing conversation and refinement aspects of the brainstorm in an unproductive manner. Group discussion is also prone to the so-called groupthink dynamic where the group focuses on a narrow path and snowballs along the path of least resistance.

A relatively small group of participants that are knowledgeable in the problem area can be a productive while still economical brainstorm team and it is often this model that companies employ for their brainstorm sessions. These small teams are adept at idea refinement, idea cross-linking and focusing on building complex solutions. The shortcoming of this group structure is that the seed material is limited in scope and size since the group is small and lacks diversity.

A hybrid method of brainstorm design can be achieved to optimize the process, steer clear of the pitfalls illuminated by research and generate superior conceptual design and problem solving. I have termed this "torrent brainstorming". There are three main aspects to the structure; the seed torrent, assimilation and refinement.

The seed torrent is an idea generation engine that is designed to feed the next stage of the process, assimilation. The seed torrent is initiated by the brainstorm leader and is comprised of a small email that is sent to a large and diverse component of the company eliciting ideas to address the problem. The format of the email is the domain of the leader; however it should be quite brief, minimally leading and minimally constraining (i.e., traditional brainstorm instructions). Many studies indicate that free association is not all that effective since the first ideas generated by even very diverse individuals are often very similar. It is for this reason that including in the problem statement a few of the obvious solutions is a good way to get participants to dig deeper and reveal the creative layers below the surface. The individuals in this group have a small period of time, perhaps 12 minutes (0.2 hours) to digest the email and sketch/describe two ideas to address the problem. The individuals have a day or two to complete the task to funnel into the assimilation phase. This individual isolated effort is shown to be more effective than group ideation efforts [Taylor et al, 1958; Bouchard, 1972] and avoids the groupthink problem. A core group of brainstorm members that will participate in the next phases of the process are afforded more time to ideate in isolation, perhaps 3X that of the wider group. The seed torrent's format also eliminates the "production blocking" problem identified by Diehl & Stroebe, 1987 and Lamm & Trommsdorff, 1973 where queuing or podium time bottlenecks idea flow.

The second stage of the process is the assimilation; this resembles a traditional brainstorm and indeed the company's current process can generally be utilized with minor changes. The leader collects the seed idea sketches/descriptions and displays them on a suitable large format board in the brainstorm room utilizing grouping where suitable. The seed ideas are briefly introduced and then the "traditional" brainstorm now commences with a small group of individuals with a deeper understanding of the problem or problem area. This group generates their own ideas but uses the torrent data as "seed" material for cross-linking modifying and building ideas as well as stimulating and allowing other ideas to come to the surface. The justification for this stage is that complex multi-disciplinary problems are arguably only tackled by building on ideas and feeding off unintended lines of thought. The assimilation stage should be fairly short in order to leave room for the next stage which will take the majority of the time.

The final stage is the "Refinement stage" and is usually bookended on to the Assimilation phase although it is technically not part of the brainstorm as defined by Osborn more so the critique follow up he advocated. This phase is conducted by the core team and it is at this phase where the ideas are evaluated, culled and matured. Research indicates the "no bad idea" edict embodied in Osborn's methodology is not the most productive manner to run the brainstorm. Nemeth, [Nemeth, 2003] demonstrated that debate fosters the most productive sessions. As PSYBLOG phrases it, "Groups aren't where ideas are born, but where they come to sink or swim". Quoting from wordpress.com "Forbearing debating and criticizing ideas, like a critique in art school, avoids exploring the depths of an idea and deciding quickly what is relevant." Critiquing ideas makes sure the good parts are honed and built upon and the bad stuff is either refined or sloughed off. Debate, discussion and criticism create a platform to provide immediate feedback, allowing a group to reshape the idea being examined rather than building on a poor base." The ideas on the table are critiqued, challenged and refined in order to drill down and reveal underlying problems and illuminate

deeper solutions. The refinement stage can be disconcerting as it is confrontational; however, this aspect is somewhat limited since at this stage a great deal of the ideas are not one person's and may have genesis outside the core group because of the seed torrent. Ideation should not be discouraged at this stage as there is some evidence that the highest quality ideas come later in the brainstorming effort [Basadur & Thompson, 1986; Parnes 1961; Paulus & Dzindolet, 1993]. This phase is actually a blending of the brainstorm with the down selection session that Osborn would have placed in a separate meeting. A fusion of the brainstorm with the down selection preserves the deferment of judgment at the beginning of the brainstorm but utilizes and addresses the research of Nemeth and others regarding the power of dissent. The refinement stage ends with a decision or candidate idea(s) that is well vetted.

This brainstorm process preserves small group economics and advantages but allows for the flurry of abstract and unorthodox ideas that a large and diverse group bring to bear to augment and pollinate the base group's creative pathways. A refinement stage eliminates detritus and uncovers issues that might be glossed over in a "nice" brainstorm. A torrent group of 20 people would incur a 4 man-hour cost to the project and will do so with minimal invasiveness and disturbance to the company while maximizing the potential for a successful brainstorm.

Not to be overlooked is adherence to Olson's tenets; especially, providing training, participant preparation and problem preparation. A trained facilitator is advocated since as Oxley showed they can improve output over un-facilitated groups or individual brainstorm sessions [Oxley et al, 1996]. These aspects are often glossed over or treated in an incomplete or cursory manner that undermines the technique.

StarFish Medical has incorporated the Torrent technique into their general practices regarding brainstorms with tremendous success. If your engineering business relies on brainstorming, think about a seed torrent approach or variant that suits your needs.

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