



2013 Best Practices Recap

2013 Annual Trends

JWT: 1-Navigating the New Normal, 2-Live a Little, 3-Generation Go, 4-Rise of Shared Value, 5-Food as New Eco-issue, 6-Marriage Optional, 7-Re-engineering Randomness, 8-Screen Interactions, 9-Celebrating Aging, 10-Objectifying Objects

What trends are affecting your business/industry?

Case Studies of Leading Innovators

1. *Expand your definition of innovation. See Doblin's "Ten Types of Innovation"*
 2. *Lessons from Apple and Tennant –*
 - a. *There is no 'secret system' but need passionate people and supportive culture*
 - b. *Network/Open innovation model – Kill NIH*
 - c. *Focus on observed needs of the user – not only what they are asking for.*
 - d. *Ignore what the markets wants today – follow your instincts – Is your company too data driven?*
 - e. *Fail wisely – keep learning.*
 - f. ***Knowledge management lacks context***
-
-

Requirements in Innovative Environments (Perry Parendo)

Errors in customer Requirements break out as follows:

- *Incorrect facts (49%)*
- *Omissions (31%)*
- *Inconsistencies (13%)*
- *Ambiguity (5%)*
- *Misplaced (2%)*

Resolving conflicts between requirements is a major challenge and may require use of tools (QFD or TRIZ) and need to utilize DOE.



Learning from Mistakes in NPD (Learn from product failures-Hlavacek, Maxwell and Williams, RTM, 2009)

Recommendations from Postmortems

Most companies listed two to five major prescriptive actions from each postmortem study. Some of the corrective actions from CTOs, commercial managers, and our companies included:

- 1. Model the front-end business case after the venture capitalists' more rigorous approach to concept and feasibility studies that are not biased to incrementalism.*
- 2. Have some engineering or design people dedicated 100 percent to new-to-the-world projects and separate them from technical people who support current customers and existing product lines.*
- 3. Have technologists conduct voice-of-the customer interviews and relentlessly look for unmet user job needs at OEMs and end-users or the customer's customer.*
- 4. Require certification in program and project management skills for all new product teams and stop using bureaucratic new product tracking approaches.*
- 5. To develop more robust solutions and systems, involve strategic suppliers and co-suppliers as collaborators much earlier.*
- 6. Require a strong intellectual property case as part of the front-end business strategy.*
- 7. Develop value propositions and pricing based upon both laboratory and field trial data.*
- 8. Shelve, kill or refocus projects earlier on different market applications.*
- 9. Establish recognition and reward systems that encourage more company-wide collaboration and projects that significantly grow sales and increase margins.*
- 10. Make process development a parallel activity to the development of new-to-the-world products.*

In companies where postmortems were a routine activity for learning from failed ventures, executives stated that their new product success rate improved significantly.

Big Data and its impact on NPD

Big Data usually includes data sets with sizes beyond the ability of commonly used software tools to capture, curate, manage, and process the data within a tolerable elapsed time.

Three V's describe Big Data-Volume, Velocity and Variability.

Product developers will need to access the computing resources and talent pools that can process Big Data. We can learn from Human Genome project, Connectome and the NSA ©.



Neuropsychology of Creativity

The first areas activated during the problem solving process were those involved with executive control, like the prefrontal cortex (decision-making and planning) and the anterior cingulate cortex (detect inconsistencies or competing activity, control attention-switching). The scientists refer to this as the **"preparatory phase"** since the brain is devoting its considerable computational power to the problem. The various sensory areas, like the visual cortex, go silent as the brain suppresses possible distractions. **The brain is acting like a "spotlight" to define the problem and muster the resources.**

"The cortex does this for the same reason we close our eyes when we're trying to think. Focus is all about blocking stuff out." What happens next is the **"search phase"** as the brain starts looking for answers in all the relevant places. "And it's up to the executive control areas to keep on searching or, if necessary, change strategies and start searching somewhere else." **The brain begins to act like a 'floodlight' to search broad expanses of brain real estate.**

Three hundred milliseconds before a participant communicates the answer, the EEG registers a spike of gamma rhythm, which is the highest electrical frequency generated by the brain. Gamma rhythm is thought to come from the "binding" of neurons, as cells distributed across the cortex draw themselves together into a new network, which is then able to enter consciousness. A small fold of tissue on the surface of the right hemisphere, the anterior superior temporal gyrus (aSTG), (above the right ear) became unusually active in the second before the insight. Back to the "spotlight" once something useful is found.

One of the key predictive signals of impending insight is a steady rhythm of alpha waves emanating from the right hemisphere. Alpha waves typically correlate with a state of relaxation, such activity makes the brain more receptive to new and unusual ideas.

The prefrontal cortex isn't simply an aggregator of information. Instead, it is like the conductor of an orchestra, waving its baton and directing the players. This is known as "top-down processing," since the prefrontal cortex (the "top" of the brain) is directly modulating the activity of other areas.

Before and during the generation of original ideas long range frontoparietal interactions during mental imagery are particularly reflected in widespread alpha synchronization which appears to facilitate the (re-) combination of semantic information that is normally distantly related thus leading to creativity (insight).

It has also been shown that unconscious processing (bottom-up) is more powerful and effective than conscious processing (top-down) thus the value of an **"incubatory phase"** during the solving process. Let the subconscious mull over the problem before forcing it to identify answers. Allow for the Aha! in the shower moment.

What can you do to artificially create the above mental states and patterns?

1. Individuals with positive affect (happier) have high higher activity in ACC during preparatory phase and higher alpha (calm) states prior to successful problem-solving. Make sure people are in a good mood.
2. Making sure the problem is fully defined allows the brain to begin using resources (bandwidth) to look for answers and not use resources to understand the problem.
3. Use methods to create higher levels of alpha waves (relaxation). Use whatever is culturally acceptable.
4. Remove distractions from the environment unless you want external stimuli to spark internal connections.



5. *Separate the problem definition and problem-solving phases in time to allow for unconscious processing in between.*
 6. *Use feedback to create mental states conducive to insight and creativity.*
-
-

Member Tours (Danfoss, Pentair)

Here are some of the things we discussed and saw in action at Danfoss and Pentair:

- *Visual management on the manufacturing floor*
 - *Use of the 5S process*
- *Pentair's NPD process*
 - *Discover*
 - *Develop*
 - *Deploy*
- *Project categorization (which determines the complexity and length of the NPD process model)*
 - *Mega*
 - *Major*
 - *Mini*
- *RACI Matrix that drives activities and deliverables*
- *3P/2P approach*
 - *Product*
 - *Process*
 - *Preparation*
- *Excel sheets pre-populated with standard work tools*
- *Use of Pugh Matrix as a tool for team-based concept generation and selection*
- *Pentair's True North strategy to identify key issues for project*
 - *On time*
 - *On cost*
 - *On quality*

Learnings? Observations?
