

The Innovation Paradox: Reconciling Creativity & Discipline

How Winning Organizations Combine Inspiration With Perspiration

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Abstract— There is a fundamental paradox related to innovation. As global competition becomes fiercer, growing importance attaches to the ability to bring to market innovative new products and services sharply differentiated from their competitors. Yet innovation is becoming more and more difficult. Companies with sufficient scale and scope to market new products globally find that their very size inhibits the creativity needed to invent such products. The growing complexity of new technologies means that innovation often requires large teams. [An early Intel microprocessor was designed by a handful of engineers; the Centrino required several hundred.] Yet creativity seems to flourish best among empowered individuals working in small units and in entrepreneurial settings.

How do successful innovators reconcile the scale, discipline and operational excellence ["perspiration"] that marketplace success demands, with the freedom, openness and even chaos ["inspiration"] within which creativity and ideation flourish?

In our research, we identified five different models, or templates, for reconciling inspiration and perspiration.

We provide short case studies of each template, as aids for organizations that seek to build an innovation system that fits their culture, history and personality.

Keywords—Creativity, innovation, discipline

I. INTRODUCTION

The ability to innovate is a vital ingredient of success in global markets. Yet innovators face a key dilemma: Successful innovation requires excellence in each of two skills that are sometimes perceived as bitter enemies: Creativity and discipline.

Creativity is "the production of novel ideas that are useful and appropriate to the situation in any realm of human activity" [1]. Discipline is the ability to achieve consistent excellence in the manner products and services are designed, produced, marketed, distributed, and serviced [2].

Discipline is meant to achieve predictability while creativity is expected to produce surprising results. This is one reason why the free, open and undisciplined atmosphere within which creativity thrives, it is widely believed, is antagonistic to the systematic management discipline needed to produce, market and sell the ideas such creativity generates. This dilemma has become severe enough to deserve the term paradox, because "disciplined creativity" is *prima facie* self-contradictory.

Many startup companies have stellar creativity and after initial success, founder because they never achieve

the discipline that operational excellence requires. Many large, long-established firms fail because their sheer size requires bureaucratic, or hierarchical, processes to run their operations; they soon find that innovation is stifled as a result.

Yet there are organizations that manage to reconcile these two key qualities, that many experts believe are each necessary for market success, and perhaps even jointly sufficient. We will describe five such approaches, or templates, for reconciling "inspiration" and "perspiration", and provide examples of each. But first we describe a useful 2x2 taxonomy.

II. CULTURE OF DISCIPLINE VS. CREATIVITY

In his best-selling book *Good to Great*, Jim Collins [3] identifies "great" U.S. companies that achieved outstanding success, and examines how and why. He provides a taxonomy of four types of organizations (see Table I): Those with both high 'culture of discipline' (organizational values that foster and focus on discipline) and creativity, and thus achieve 'greatness'; those with high creativity but low discipline (startups); those with both low creativity and discipline (bureaucracies) and those with low creativity but high discipline (hierarchies).

TABLE I. TAXONOMY

CREATIVITY:		
CULTURE OF DISCIPLINE:	LOW	HIGH
HIGH	<i>Hierarchy</i>	<i>"Great" Organization</i>
LOW	<i>Bureaucracy</i>	<i>Startup</i>

Collins defines "culture of discipline" as an internal quality, in which individual members of the organization choose to meet rigorous operational challenges, deadlines, milestones, etc., in implementing creative ideas, not because of external controls or rewards but because they simply want to do so, because it is a core value that is a part of their personality and their thinking. This is different from 'bureaucratic' controls, where external constraints mandate systematic discipline according to a set of rules; or where lengthy chains of command are set up, so that one person tells another below him or her what to do and how to do it and sees that the order is executed. Bureaucracies are organizations where rules substitute for internalized discipline. They are enemies of creativity

because rules are the antithesis of creative rule-breaking. Hierarchies have internalized discipline, because its members are trained to carry out the wishes of their bosses, but often are not creative, because a) ideas originating at the bottom of a hierarchy, where many great ideas are born, often die before they get approval of those at the top, and thus b) creative individuals quickly despair and forego proposing new ideas from the outset. Only organizations that somehow combine a high internalized culture of discipline with high levels of creativity achieve sustained growth and profitability, or some other measure of success. Collins identifies 11 such "great" companies.

An exercise we have found it useful is to ask members of an organization to score their business unit or organization on a scale of 1 to 10, for each of the two dimensions, creativity and discipline, a) as it currently is, and b) as it *should be*, to achieve enduring success. This serves as a useful starting point for examining change processes and action plans that will close the gap and move the organization toward the desired objective.

The central claim of this paper is that *each organization that seeks greatness must have a plan for reconciling creativity and discipline, a plan that is well aligned with its history, culture and personality.* Such a plan must deal with each of the five elements of business design: strategy, organizational structure, people, process and rewards and show how each of these elements encourages both discipline and creativity to flourish together.

Some experts have claimed that building wealth centres almost exclusively on the ability to *resolve conflicting values*, (such as creativity and discipline, or short-term and long-term success), and optimizing tradeoffs between them.. We contend that mediocre organizations optimize tradeoffs (either/or), while great organizations *reconcile* them (both/and) (see [4]).

"Few successful startups become great companies," Collins notes, "because they respond to growth and success in the wrong way. Entrepreneurial success is fueled by creativity, imagination, bold moves into uncharted waters, and visionary zeal. As a company grows and becomes more complex, it begins to trip over its own success -- too many new people, too many new customers, too many new orders, too many new products. What was once great fun *becomes an unwieldy ball of disorganized stuff*. Problems surface -- with customers, with cash flow with schedules. "

The response to such operational problems is often a bureaucratic one. "...someone (often a board member) says: 'It's time to grow up. This place needs some professional management'," Collins continues. "Chains of command appear...what was once an egalitarian environment gets replaced with a hierarchy. 'We' and 'they' segmentation appears....The professional managers finally rein in the mess. They create order out of chaos, but *they also kill the entrepreneurial spirit*. Members of the founding team begin to grumble, 'This isn't fun anymore. I used to be able to just get things done. now I have to fill out these stupid forms and follow these stupid

rules. Worst of all, I have to spend a horrendous amount of time in useless meetings'. The creative magic begins to wane as some of the most innovative people leave, disgusted by the burgeoning bureaucracy and hierarchy." [6].

In conversations with organizations with proven track records in innovation, in widely differing areas of activity (military, advertising, high-tech, entrepreneurship), we identified at least five different models, or approaches, used by organizations to successfully fuse discipline and creativity.

While differing widely, each of these models has a property known in materials science as 'eutectic' -- from the Greek word *eutēkos* meaning "easily fused". When precise combinations of temperature and pressure occur, the eutectic material suddenly achieves new and desirable properties. Eutectic innovation is an approach to innovation, such that not only do the lion of creativity and the lamb of discipline lie down together, but rather they become fast friends, reinforce one another and develop synergies that strengthen, rather than weaken, one another. We now briefly describe these five templates and provide examples. Each has its own eutectic point.

III. FIVE TEMPLATES

We interviewed key players in organizations with proven track records in innovation, from widely differing activities. We identified five different models, or templates, for organizing inspiration and perspiration. They are:

1. "**The Great Dictator**" - a single person of genius, who directs the ideation and research, builds the business model and then implements it; the others in the organization are all basically in discipline mode.
2. "**Separation of forces**": completely different groups that do ideation (the "creative department") and implement ideas (the "discipline department" with an arbitrator responsible for idea selection).
3. "**This Train Runs On Time**": A highly systematic process, in which ideation, proof-of-concept, prototyping and project management are run according to a highly detailed, and organized timetable. Here, the basic idea is that there is a time division between the creative phase and implementation phase of a project -- this is the basic idea. Different people may drive the process at different stages.
4. "**Elders of the Tribe**": ideas are advanced by younger, creative members of the organization, who are then cross-examined by experienced members, who try to poke holes in the ideas and find weaknesses; only ideas that survive this severe grilling are moved toward implementation.
5. "**Head in the Clouds, Feet on the Ground**": here, the ideation process is split into two distinct parts -- wild brainstorming, where no idea is rejected on grounds of feasibility ("head in the clouds"), and hard-headed business and engineering analysis ("feet on the ground"), where the idea is tested for its feasibility, viability, and suitability to the skills and goals of the organization. The

same people are required to switch between creative mode and discipline mode as part of their routine.

There are clearly many more such models. It is important to stress that each organization must build its own innovation system, tailored to its needs. But virtually all great organizations have such a system, whether tacit or explicit.

We now provide brief examples or short case studies of each template.

IV. CASE STUDIES

1. **"The Great Dictator"**: Here, a single person controls the entire innovative process, from idea selection through implementation, production, marketing and distribution. The single leader/manager/arbitrator provides integration and a broad market perspective, knitting together conflicting forces within the young organization.

Very few persons combine all the qualities needed to make this work. Startups led by founders who do not reconcile discipline and creativity *within their persona* create Founder's Disease: dogged insistence of the entrepreneur-founder to remain in control, long after their insights, leadership and abilities no longer match those needed for organizational success. Such disease is often cured only when investors and boards of directors painfully and forcibly remove the founder.

Successful Great Dictators are good at systems thinking -- they see all parts of the business system and *from the outset* work to knit them together into a powerful single unit, which they personally lead.

This is the model employed with huge success -- at least for a time -- by Thomas Edison, in bringing electricity to homes and businesses around the world. As Edison's biographer notes: "One consistent sign of Edison's genius...was his inclination to think globally long before achieving success locally. 'All parts of the system must be constructed with reference to all other parts,' he wrote of the electric light endeavor, as he viewed it, 'since in one sense all the parts form one machine' ". [5]

Edison was a Great Dictator. He led the efforts at invention. He found the right material for the light bulb's filament. He built the business model. He did the public relations work and raised the funds. And he built the organization that electrified America.

Great Dictators rarely know when to exit gracefully from the stage. Later in his life, a victim of "founder's disease" and deaf, Edison became alienated from his company and the disciplined bottom-line management ethic he had instilled. He was forcibly removed by the managers of the company he founded. All too often, Great Dictators end their career in ignominy, as they fail to change and adapt to the times. *This is one of the flaws of the Great Dictator innovation model*

2. **"Separation of forces"**: Here, the creative department does the inspiration, while another department does the perspiration. Management must choose the ideas and continuously mediate the built-in conflict between the

two. In high-tech companies, this is implemented by having separate R&D or engineering, and marketing, functions. We found this model in one of Israel's leading advertising agencies. The basic principle: Separate the idea creators from the idea choosers" and idea implementers.

As one of the founders told us: "You must have complete freedom in coming up with ideas. Otherwise: you'll get 'more of the same'. There are lots of great creative ideas. *You have to choose among them*. Often, the wrong ones are chosen for implementation. The US adman Bill Bernbach (one of the founders of a legendary ad agency, Doyle Dane Bernbach), often said: the essence of creativity lies in CHOOSING ideas -- there are endless ideas out there, the problem is to pick the right one!"

He continued: "The creative department (note: creative people are highly paid -- higher than other parts of ad agencies): comes up with ideas. The campaign is presented to the implementation dept. Ideas are often broad. A sketch of a film is presented. This then goes to the CEO and comptroller--they have authority to authorize the campaign. Once authorized, the media dept. chooses the media. The final film is an end product. A budget could be \$2m for a campaign; a film for TV could be only 15 sec., or 30 sec. "

"On the set itself: the creative people have the last word! This was once not the case -- we learned that often, during the past 15 years, key ideas were changed, and got lost. So the creative people, and implementers, each have to OK the final result."

"What we learned from a major global ad company, who invested in us, is this: After the whole process ends, and the film has been made: the CEO must give his final OK. And he may say NO! This is costly, but has happened. This is very important -- killing projects before they are launched. There are other milestones, but this final one is a key one. The CEO may cancel a campaign even when it is finished, and this could cost hundreds of thousands of dollars. And this has happened more than once."

Summing up the four principles of Separation of Forces: 1. Separate the creative process from the implementation process. 2. Final authority for implementing the creative idea lies with the CEO. 3. Authority for deciding on HOW the creative idea is put into practice should rest with the creative people who invented it. 4. Creative people must be educated in working under constraints (time, money, etc.). Constraints ("in-the-box thinking") can be an aid to successful innovation, rather than a hindrance.

3. **"This Train Runs On Time"**: We found this model at the Philips Design Studio in Singapore. In this approach, discipline becomes a strategic asset throughout the innovation process, including the ideation/creativity stage. As a highly disciplined society and economy, Singapore-based innovation must take into account the cultural values within which innovation occurs.

In Philips - Singapore, innovation is like a train; it stops at well-defined stations, at defined points in time, according to a very clear and precise timetable. The innovation cycle lasts about a year. Weeks 1 through 26 are driven by innovation. Then there is a kind of 'handoff' with weeks 27 through 52 being driven by product planners and marketing; marketing is involved right from week 27. Here is how the method was used to develop a successful variant of a mini-stereo system:

The kickoff event is the New Paradigm workshop in week 3. Preparation for this workshop begins at the start of week 1. Notes Francis Chu: "The New Paradigm workshop aims to trigger ideas. We provide rich context as personal experience to facilitate idea generation. Sometimes when designing, we forget about what people's homes look like, how the set will be competing with others on the shop floor. For example we took time to explore IKEA and illustrate how the product looks on the shelf. I took photos of shelves -- and shared them with the team as an additional input to trigger ideas.

"Over 100 different ideas were generated by the participating teams who then reported them in the plenary session. Ideas for implementation were then chosen, based on analysis of their costs and benefits.

"After the workshop, further development of the chosen ideas is done in innovation teams. For example: a team of five persons is assembled, including: an innovation manager; a designer; and one each from the areas of software, mechanical, and electrical. The final decision always rests with the commercial person.

"During week 16, a Product and Development Workshop is held, to move the ideas forward. Notes Chu: "we've found it useful to observe users experiencing the product -- try it, play with it... then we observe how they use it. Sometimes we videotape them. This can inspire new thinking, which can improve the concept. This is *not* like many focus group studies or statistical research. This method provides instant feedback to the team. *The innovation team itself facilitates it, not an agency.* The loop is: see the product used ---> change it---> see again how it is used.

"A **midyear update** workshop is held during week 26. This is to check user feasibility and technical specifications. This is the stage at which marketers, and product planners, become dominant, and begin to pilot the project toward the market.

"Soon after, during week 30, a Long Term Product Planning workshop is held, at which the 'architecture' of the product for the coming 18 months is defined. The innovation team meets with planner and a product Road Map for the next 18 months is constructed. At this stage the planner communicates the new product idea to various geographical regions and asks for feedback on the product and on its price. Often a product profile is constructed, comparing the product with its competition, feature by feature. This is followed in week 44 by the High Design Process workshop. In many innovation systems, the product designer joins only at this stage, after the product specifications are clearly defined. But in the Philips

system, the product designers participate in the process from the outset, right from preparations for the week 3 New Paradigm workshop."

According to Philips' Corporate Market Intelligence group. "The FWC577 (one of the game port mini systems developed using the above method) was doing very well in the U.S. between Aug-Oct. 2003. It is the best selling Philips Mini/Micro product in the period with 2.3 million units sold."

4. "**Elders of the Tribe**": Conversations with those familiar with elite military units, such as commandos, revealed an interesting model for ideation and implementation. Everyone in the unit, from the newest and youngest members, is expected to come up with creative ideas. There is a strong 'culture of creativity'. The ideas that emerge are put together into an operational plan. Then that operational plan is submitted to the "elders of the tribe" -- experienced senior officers with broad and deep practical knowledge, tested in battle. Those officers submit the idea and its operational plan to a "trial by fire", and grill the authors about every possible disaster scenario. Some ideas survive this trial, and others do not. Often, the "elders" come up with their own creative ideas that modify, change or adapt the ones they are testing. Once an idea is approved, the military organization has the inherent discipline needed to implement it successfully. In innovative small elite units, that discipline is neither bureaucratic or hierarchic, but rather internal, built through years of training, giving individual soldiers internal 'compasses' that guide them doggedly to their goal even in the confusion and chaos of battle conditions.

We encountered this model during interviews with senior military officers. According to it, creative individuals (often younger members of the organization, but not always) spark ideas, which are then very carefully examined, explored and tested by for instance, experienced senior officers, 'elders of the tribe', who bring long years of field experience to their analysis. .

This template creates what some see as a "schizophrenic" organization. It practices day-to-day discipline, emphasizing safety, risk-minimization and discipline (including compliance, hierarchy, procedures). At the same time the organization admires and promotes risk-takers *who challenge all of the above*. This is the most emotionally-demanding template for reconciling the conflicting values, *because members of the organization have to struggle with the double-message all the time*. The elders of the tribe are often personal examples of people who were promoted because they broke some laws, took risks and succeeded. These elders are then placed in charge of maintaining discipline -- and of encouraging creativity. It is they who show the adaptive leadership that makes this difficult system work.

5. "**Head in the Clouds, Feet on the Ground**": In this model, creative groups brainstorm and float sometimes utterly outrageous ideas, with their 'heads in

the clouds'. Then, as this process exhausts itself, the group shifts gears, at a signal, and changes focus. The focus in stage two becomes one of 'feet on the ground' feasibility, testing the business design and viability of the idea, its potential, and its technical feasibility. The group regularly iterates between these two phases. In one form of this template implemented at Intel by Bob Colwell, there was a biweekly, rather wild brainstorming meeting, followed by detailed evaluation homework assigned to the same group of microprocessor architects. (Often academic research is conducted this way in technological areas: researchers frequently switch modes between ideation and evaluation, and every new piece of work is judged both by the originality of the idea and by its practical feasibility. In this way, organizations retain creativity but ensure that operational discipline is also invited to the table.

For example: An Israeli startup came up with an idea to build a device for ultrasound cardiologic diagnosis based on the PC ('head in the clouds'). The idea was rather 'wild' because at the time (1998) the PC was far from having the processing capacity needed for the idea to be feasible. However creative R&D engineers felt that through Moore's Law this constraint would be eliminated when the product reached the market in 2-3 years.

In late 1998, GE Medical bought the company. GE Medical had earlier rejected the idea of PC based ultrasound for cardiology. But they agreed to let the acquired startup's team pursue the 'head in the clouds' idea. Once a prototype existed, GE's feet-on-the-ground management system, based on what is known as 'Six Sigma', took over, and guided the innovation process through to ultimate marketing, sales and servicing. The startup founders themselves say they were unlikely to attain market success without GE -- but at the same time, GE Medical may not have had the bold head-in-the-clouds creativity of the startup [6]. This is why feet-on-the-ground companies often seek head-in-the-clouds ideas by making acquisitions of startup companies.

V. CONCLUSION

"Genius," Thomas Edison wrote, in a widely-quoted passage in his 1924 autobiography, "is one percent inspiration -- and 99 per cent perspiration." We disagree. *Innovative genius* is 100 per cent inspiration -- and 100 per cent perspiration. Edison's own success proves this. Inspiration -- creativity, leading to invention -- and perspiration -- the culture of discipline, leading to marketplace success, growth and profit -- are necessary conditions, and possibly, jointly sufficient, for innovative success. Inspiration and perspiration can be enemies, or allies. *The task of innovators is to reconcile the innovation paradox and make them strong allies.*

There are many ways to do this. In this essay, we present five different approaches that we have observed in winning organizations. There are doubtless many more.

Every organization seeking core competence in innovation -- and there are very few organizations who

are exempt from this -- must look inward and outward, examine its culture, structure, strategy and resources, study best practices, and based on this inventory and needs assessment, build an approach to welding inspiration and perspiration that is most suited to it.

In the two-dimensional space of creativity and discipline, there is a eutectic point uniquely suitable for each organization. It must be aggressively sought and once attained, determinedly maintained. Each of the five templates we described contains a high-level challenge for those who manage them, and 'sinks' that absorb large amounts of energy. For example: the divide and conquer approach in "separation of forces" creates rivalry among members of different teams and management must deal with it all the time. The 'elders of the tribe' model involves a kind of organizational split-personality that creates continual tension and potential instability.

Organizations' innovation systems are dynamic. As organizations grow, they may need to shed old systems, like snakes shed their skins, and embrace new ones, *even when such systems have proved enormously successful in the past.* Implementing change under perceived success is a major challenge. As they mature, many organizations focus on operational discipline and cost reduction. In today's competitive global marketplace, this is vital. Yet no organization can grow and thrive solely by optimizing efficiency and slashing costs. The discipline that cost education entails should not be allowed to strangle creativity. Cost reduction and value creation must become allies, not warring enemies.

What is clear is this: The innovation system of each organization must be constantly defined, examined, dissected, and where needed altered -- and where no such system exists, one must be developed. Innovation can no longer be left to random forces or serendipity.

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