# BUILDING HIGHLY EFFECTIVE IDEA MANAGEMENT SYSTEMS WITH LIVING SYSTEM PRINCIPLES

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## Abstract

Today's enterprises are increasingly dependent on innovation, not just to fuel growth but also to differentiate and survive in highly competitive environments. Enterprises feel the need for a structured process to manage the inherent complexity of innovation. Traditional approaches such as idea management funnels and stage-gate approaches are proving difficult to sustain and scale. More importantly, with such processes enterprises are losing out on the potential of a large number of ideas filtered out early in the cycle. How to build effective and sustainable idea management systems, while dealing with the inherent complexity and unpredictable nature of ideas and innovation? Living systems are excellent examples of complex systems that sustain and evolve over time. This paper explores key living system principles and ways in which they can be used to build highly effective enterprise idea management systems.

## Background

Enterprises traditionally use an idea management funnel (or variant) to filter and channel ideas using a stage gate process [1]. At each stage gate, decision makers select the ideas to be taken forward and identify the ones to be kept on hold or discarded.

Studies [2] have estimated that only one out of 3000 raw ideas (unwritten) or 300 submitted ideas makes it to eventual success. Generating such a large number of ideas is a steep ask! More importantly, every idea that loses out in the race to the top leaves in its wake, a dampened morale and some disillusionment with the "system". With few successes and many failures, slowly but surely, a huge inertia builds up – a combination of fear of failure, cynicism, lack of interest and lack of direction. It becomes more and more difficult to inspire the next generation of ideas. Enterprises then try to inject artificial doses of enthusiasm to kick start the idea generation process – idea boxes, competitions, conferences, training and awareness sessions, creativity camps etc. These temporary pills lose their uniqueness quotient and effectiveness very quickly, only serving to accentuate the problem further.

*Clearly, our current linear idea management processes, derived from regular management approaches to deal with more predictable inputs and outputs, are neither productive nor sustainable!* A fundamental question crops up – are there structured ways in which complex systems can survive and thrive? Here we can take inspiration from living systems – cells, organisms, ecosystems, organizations, societies etc.

## Idea Management Systems and Living System principles

Some of the principles and characteristics of Living Systems [3] [4] are listed below.

| | | | |
|---|---|---|---|
| Interdependence | Non-linearity | Hierarchical | Process-oriented |
| System integrity | Emergent Properties | Complex | Multifunctional |
| Diversity | Flux | Self-maintaining | Contextual |
| Co-operation and Partnership | Thermodynamically Open | Self-renewing | Autopoesis |
| Rightness of Size | Far from equilibrium | Adaptive | The Commons |
| Living Cycles | Dissipative networks | Nested | Cognition and learning |
| Waste=Food | Autocatalytic | Oscillatory | Networks |
| Feedback | Self-organizing | Exponential Growth | Stocks and flows |

Let's explore some of the principles in detail.

### [Waste = Food]

We all know this fundamental recycling principle in biological and ecological systems – one organism's waste is another organism's food. Recycling conserves both energy and materials.

The following fundamental changes are required to build recycling into our current idea management processes and systems:

1. **Create the recycling process channel**
   Every discarded idea carries within it the energy and effort invested in the idea, a lot of information, knowledge and learning and many times partially working concepts and prototypes. Intrapreneurs continue to carry and propagate the experiences (both positive and negative) of "having tried and failed". Every idea that that is filtered out must mandatorily go through a recycling process to utilize the materials and energy embedded in that idea.
   a. Store complete or partially working concepts in a working concepts repository,
   b. Decompose the remainder to get essential elements – unsolved problems and opportunities, key learning
   c. Store and tag the knowledge for easy future access
   d. Build a cadre of mentors out of "those who failed". This removes the stigma and fear of failure and helps retain and utilize the intangible wisdom of experience.

2. **Create a continuous long term context**
   Waste can only be re-used if there is a continuing use for it.

a. Problems and opportunities of strategic interest enjoy long term support and interest. They offer a continuous context for ideas to be recycled.
b. Idea Management, therefore, should not start with ideas, but with key strategic problems and opportunities.

3. **Identify and synchronize with the enterprise rhythm**
   Every enterprise works to a specific rhythm, where its capabilities and resources are put to optimum use. This is similar to body clocks of organisms or decomposition cycles of materials. An R&D firm may work on 2 year rhythms. Software services firms may work on 6 month rhythms.
   a. Ideas whose development cycles are out of sync with natural enterprise rhythms tend to be unsustainable.
   b. Working with natural rhythms ensures timely flow of funds and resources and cuts down on all kinds of delays.

**[Diversity, Multifunctional]**

Nature doesn't try to predict or pre-decide outcomes. Instead, living systems evolve through the continuous process of variation and selection. Through variation (achieved through combination or mutation), every organism tries to reach a special niche where competition for resources will be less. The continuously changing, unpredictable environment or context selects the most conducive variations. Of course, most variations are unsuccessful. Wider variety improves the chances of selection in the short term. In the long term, over multiple cycles of variation and selection, multiple diverse capabilities combine to create more and more robust organisms, species and ecosystems.

Following the above principles, an idea management system should:

1. **Create an extraordinary variety of ideas**
   This is easier said than done. An enterprise typically consists of a set of people with similar shared experiences, academic and cultural backgrounds. Within the enterprise, standardization is the norm, not variety. Even serendipitous ideas tend to be very similar. Initially, combination and mutation capabilities have to be artificially injected into the system; with time these capabilities get embedded into the enterprise fabric.
   a. *Combination* can be achieved through cross-functional and cross-cultural teams, either from within the enterprise or from outside.
   b. *Mutations* can be introduced through creative and inventive thinking frameworks like De Bono's Lateral Thinking [5], Altshuller's TRIZ [6] etc.
   c. One may also have to recruit people with a penchant for "variety"– people who naturally search for variety and change rather than stability.

2. **Create a natural environment**
   Ideas should be allowed to evolve and become more robust before they reach the "natural" market environment, by playing out the variation-selection processes within the enterprise.
   a. Business ecosystems should include modeling, simulation and scenario building to play out ideas and explore outcomes in diverse alternative futures.
   b. Technology ecosystems should include a variety of labs – labs to combine and cluster ideas, labs to introduce and test variations, technology foresighting labs and labs to run through iterative idea prototypes
   c. Pseudo-market ecosystems should include forums where employees, customers, suppliers etc. can use, play with and vote for ideas.

### [Far from equilibrium, Flux, Oscillatory]

Organisms strive to constantly change and adapt, because they are never quite perfectly suited to the environment, which keeps changing; there is no equilibrium state. While individual variations are completely unpredictable, chaotic systems are known to oscillate around and gravitate towards equilibrium points called attractors [7]. For example, the temperature of a lake may hover in and around a specific range, never settling in on one temperature point, for the lake ecosystem to flourish. Idea Management Systems have to walk this tight rope as well.

1. **Identify existing inertia points**
   Most enterprises have long histories of processes that improve productivity, efficiency and predictability of work. These are strong inertial attractors [8]. Indeed, existing idea management systems (even the latest ones that use online innovation platforms etc.), have been unable to escape their pull.

2. **Define new attractors**
   Here, we can take inspiration from multiple sources.
   a. TRIZ, The Theory of Inventive Problem Solving [6], stresses on "***Ideality***", a state where all benefits of a system are achieved without cost or harm. This is seconded by principles of The Toyota Way, which strives to achieve maximum value with minimum resources and waste.
   b. Design Thinking [9] proponents stress on "***Simplicity***" and "***Elegance***", a seamless combination of form, function and behavior.
   c. Natural systems revolve around "***Sustainability***", to ensure survival and longevity.

   Good attractors are like lighthouses. An enterprise where each idea strives to get simpler, ideal and sustainable can expect to be very successful in the long term.

3. **Measure movement and success with relative rather than absolute metrics**

It is never easy to predict if an idea can fetch you a million dollars. It is much simpler to assess if one idea has a better chance of fetching you million dollars than another. Relative metrics allow for variation, freedom and flux while absolute metrics, stuck in space, time and context, soon become obsolete.

### [Interdependence, Co-operation]

The natural world is full of relationships – competition for food or sex, predator-prey, collaboration through symbiosis or by forming packs, herds etc. A maze of such relationships constitutes an ecosystem where each individual is just a cog in a large complex wheel. By participating in such an ecosystem, each individual and species benefits and evolves.

In this regard, our current idea management systems are very primitive still; the predominant relationship is that of competition – individual ideas fight with each other for survival. We need an ecosystem where more complex relationships can be established between ideas.

1. **Watering Holes**
   *Watering holes are locations of heightened competition and collaboration.*
   a. Ideas should be encouraged to compete and collaborate for resources.
   b. To some extent temporary watering holes have started to form, be it Idea Jams and competitions, online idea platforms (Nine Sigma) or social network platforms (Facebook, Twitter). A temporary watering hole offers fewer opportunities for meaningful collaboration to develop.
   c. A perennial watering hole on the other hand maps to an Iterative Prisoner's Dilemma scenario, where players remember previous behavior and adapt accordingly [10]. Here collaborative strategies prove more fruitful and successful. Collaboration is thus learnt naturally! Enterprises must create a large number of perennial resource pools that ideas can regularly visit.

2. **Shelters**
   Social animal groups such as wolf packs and ant swarms (and even human beings) function remarkably like large mega-organisms, achieving much more than what a single individual can ever hope to achieve [10]. Staying together in sheltered environments (such as caves or nests) creates opportunities for playing, sharing, communicating and learning.

   *Can multiple ideas stay together, bond with each other and cluster into mega-ideas?* Definitely yes! However, enterprises need to provide a sheltered environment for such idea clusters to develop.
   a. Technology and business incubation cells today provide an optimal environment for an idea to develop and hatch. However, once hatched, the idea is on its own in the market.
   b. Next generation incubation systems need to shift their focus from individual ideas to groups of connected ideas. Groups of ideas can grow up together and hunt in packs, enjoying significantly better survival rates and ROI in the process.

## [Self-organizing, Adaptive, Emergent]

Emergence is probably the most paradoxical of all living system principles. Crystals spontaneously emerge from saturated solutions. Migrating birds automatically form perfect V-shaped squadrons. Fireflies synchronize their light emissions. There is no central controlling power in natural systems, yet complex structure and behavior emerge automatically to prevent the reign of chaos [11]!

As humans, we are used to creating deterministic systems that are specialized at achieving pre-determined outcomes. It is difficult for us to imagine self-organizing systems - we invariably associate the absence of centralized control mechanisms with anarchy and chaos. If one were to collect all the parts that go into an aero plane in a box, would the parts automatically organize themselves into an aero plane [12]? Similarly, without a direction-giving authority, how would a bunch of ideas work out the best strategy for business success by themselves?

However, as it turns out, deterministic models apply only to the simplest of systems. One of the TRIZ laws of system evolution [13] discusses the clear evolution trend of systems from non-controllable to adaptive, self-organizing and self-reproducing systems i.e. from simple-deterministic to complex- living systems.


Interestingly, while our washing machines have already moved to the adaptive stage, enterprise idea management systems continue to lag behind. It is difficult for enterprise driven by business outcomes to suddenly let go of control and design systems that allow ideas to "emerge". However, gradual progress is possible.

1. **Feedback Points**
   Feedback can be either negative or positive, and both are useful [14]. Positive feedback can be used to reinforce and accelerate good behavior e.g. a quick working prototype of an idea quickly produces many next generation prototypes. Negative feedback can be used to nip problems in the bud e.g. an idea that gets into waiting state very often will be automatically pushed down the priority list. In either case, for truly emergent systems to be designed, there need to be a large number of feedback points distributed throughout the system

2. **Localized Action**
   Feedback points are necessary but not sufficient; how the system responds to feedback is critical. Current systems collate feedback and channelize them to some kind of centralized intelligence (be it a person at the top of a hierarchy or a central processor in a distributed network). This is faster and more optimal in the short term, but eliminates the need for localized adaptation and learning.

On the other hand, decentralized decisions and action, while possibly more error prone and sub-optimal in the near term, gradually help build up vitality in the entire system.
Decentralizing idea management systems is not easy. If resources are centralized, decisions (that control or allocate those resources) will tend to be centralized as well.

1. The first step therefore is to decentralize the resource pools – have smaller resource pools but a larger number of them.
2. The second step is to encourage small localized decisions and actions based on feedback e.g. which ideas are suitable for the next installment of funds
3. Rather than one big idea hogging a resource pool, an emergent system encourages clusters of ideas, fed by small resource pools to collaborate and build a larger, sustainable idea. This is a fundamental inversion of idea management paradigm.

## Conclusion

When compared with traditional management functions, innovation deals with unpredictable inputs and outputs and non-linear risks and rewards. Ensuring a continuous supply of high quality ideas and taking those ideas to fruition with a high success rate is no mean task. Living Systems provide great clues into how complex systems can sustain and thrive in a complex environment. Principles such as recycling, diversity, multi-functionality, flux, interdependence and emergence have the potential to transform the innovation capability of enterprises and help them lead in an increasingly complex, uncertain and exciting future!

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Karthikeyan Iyer (Karthik) is a Founder Director of Crafitti Consulting, an innovation research and consulting think tank.

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