DATA CATALYST INSTITUTE

FUZZY LOGIC:

A NOVEL “INNOVATION ARCHETYPE MATRIX” TO GUIDE GOVERNMENT, CORPORATE, AND NONPROFIT INNOVATION EFFORTS

DETAILED CASE STUDIES

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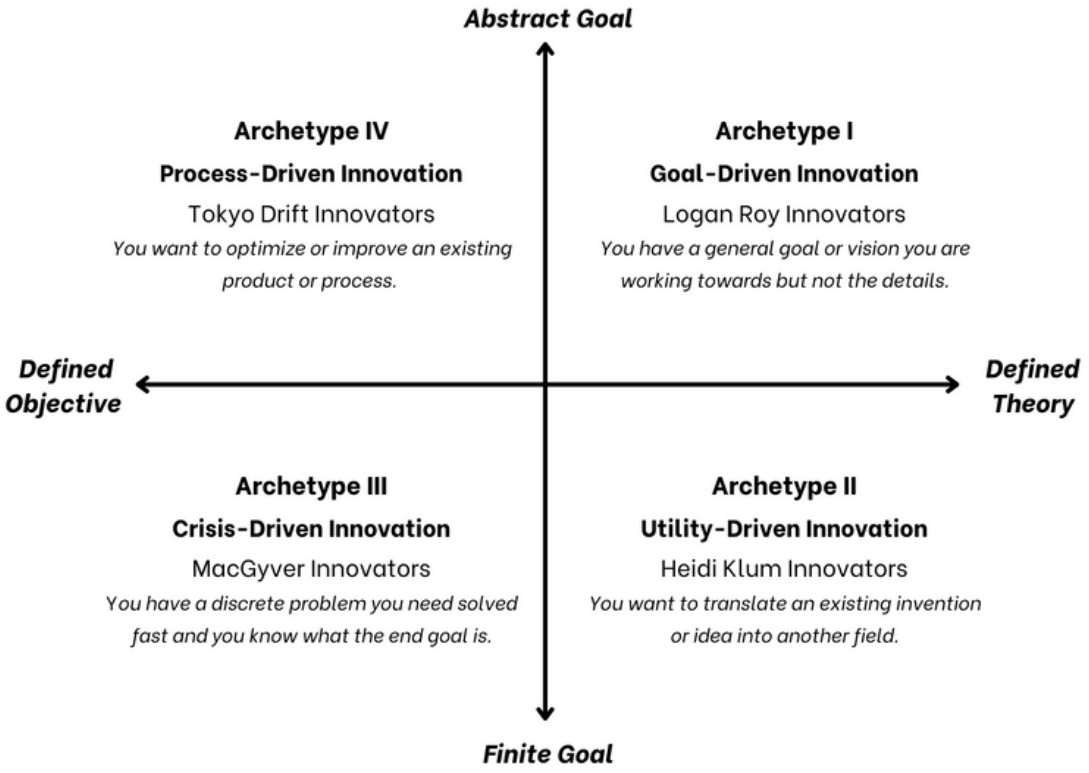
June 2024

DETAILED CASE STUDIES

To encourage “moon shots”–creative and ambitious endeavors with the potential to be groundbreaking–calls for innovation should be as unrestrained as possible. However, different archetypes of innovation best serve different goals and problems. While the resulting innovation from each archetype can be similar, the particular circumstances and viewpoint of the innovation can change the outcome and the initial potential for success. Here, I identify the four innovation “archetypes” that depend on available inputs and types of benchmarks.

The matrix describes the four innovation archetypes, nicknamed after popular TV shows. Identifying the innovation archetype for your particular objective can define and refine the innovation process–and, secondarily, the parameters of a challenge or call for participation—address discrete problems, kickstart entire innovation ecosystems, and realize big dreams. Below, I briefly describe these in more detail.



ARCHETYPE I: GOAL-DRIVEN INNOVATION

"Logan Roy" Innovators

You have a general goal or vision you are working towards but not the details.

Case Study: Apollo 11 Moon Landing

Abstract Goal: President Kennedy set a national goal to perform a crewed lunar landing and return to Earth.

Defined Theory: If we land an astronaut on the moon and get him back to Earth, we will meet our goal. It's never been done before, so we don't have a model.

Process:

- Identify actions that could meet the theoretical benchmark (building a spaceship, training astronauts, a successful launch, and a successful landing).
- Determine intermediary steps to achieve each benchmark. Likewise, identify potential roadblocks and existing solutions that can be incorporated.
- At this point, you begin to treat each separate problem as an Archetype III innovation.
- Include legal, social, and communication needs which also must be dealt with. If it does not appear feasible, then shift the goal to something possible.

Challenge Competition Application

Archetype I challenge competitions should state the overarching goal that needs to be achieved. A winning solution should explain the method to achieve the goal, survey existing solutions' feasibility, and present an original solution prototype or process. These competitions could last longer with solutions constantly accepted until the stated goal is achieved. Judging for Archetype I can be more subjective than other innovation archetypes. Identifying a new unsolved problem is sometimes just as valuable as a new solution. Future challengers could build upon the winning solution by offering a different, or more optimal way to solve the accepted solution as part of a future problem/solution.

ARCHETYPE II: UTILITY-DRIVEN INNOVATION

"Heidi Klum" Innovators

You want to translate an existing invention or idea into another field.

Case Study: BLB Oxygen Mask and Aviation

Finite Goal: We need something that will allow bomber pilots to withstand G-Force pressure without passing out.

Defined Theory: At high altitudes, pressure reduces oxygen to the brain and blood flow to the heart, causing bomber pilots to pass out. We can rework existing oxygen masks to adapt to this situation. A winning solution would be a method or product developed quickly that prevents pilots from passing out.

Process:

- Begin by analyzing existing materials: Mayo Clinic scientists already had a mask that delivered oxygen to patients in clinical settings.
- Modify the existing materials or processes to meet the demands of the analogous task: The oxygen mask developed for pilots provided as much supplemental oxygen as needed, in addition to features that made it frost-resistant, integrated a microphone for radio communications, and allowed pilots to talk with the mask on.

Challenge Competition Application

Archetype II calls for innovation should state the goal or explain the problem that needs to be solved. A winning solution would present a prototype or process that meets the goal, as quickly as possible. The judging here is somewhat subjective because solutions have to meet the magnitude of the stated problem and successfully translate/adapt a material or process. If the stated problem is not considered to be of a high enough magnitude, or if the solution doesn't solve the stated problem, the solution does not receive any award.

ARCHETYPE III: CRISIS-DRIVEN INNOVATION

"MacGyver" Innovators

You have a discrete problem you need solved fast and you know what the end goal is.

Case Study: Deepwater Horizon Oil Spill and Cleanup

Finite Goal: An offshore drilling unit exploded, spilling oil that needs to be cleaned up immediately to protect wildlife and mitigate damage.

Defined Objective: A cleaned-up, decontaminated area.

Process:

- Investigation: If you don't have an existing playbook entry for cleaning up this specific chemical spill, you need to find out what type of material it is, what is generally used to clean it up, and the extent of its impact.
- Implementation: That is not the ultimate solution because you still need to identify a way to implement the clean-up process within the existing constraints. Remember, for these "battlefield" crises, time is of the essence. The solution doesn't have to be beautiful to solve the problem, it just has to work. Jerry-rig is something to start; you can always iterate later.

Challenge Competition Application

Archetype III challenge competitions respond to concrete problems that need to be solved quickly. Details to competitors should be given as fact-based descriptions that only provide actual constraints. Solutions should demonstrate efficacy with a simulated or micro-version of the replicable problem. Crisis-driven innovation solutions are binary by nature, either they work, or they don't work.

ARCHETYPE IV: PROCESS-DRIVEN INNOVATION

"Tokyo Drift" Innovators

You want to optimize or improve an existing product or process.

Case Study: Electrical Vehicle Charging Optimization

Abstract Goal: Somehow increase miles per charge of electric vehicles while not worsening other capabilities (battery strength, charging time, efficiency).

Defined Objective: The current maximum benchmark for energy usage for electric vehicles is 150 Miles Per Charge. The innovation would make MPC higher than that.

Process:

- Analyze every aspect of the process, and see what can be replaced, changed, or optimized.
- The end result is to get a cumulative benefit, not a specific number.

Challenge Competition Application

Archetype IV challengers must beat the stated current level by a set benchmark, which maintains or improves all other existing baselines. This type of challenge can be ongoing because as new technology is developed further optimization may be achieved. The winning result objectively exceeds the current standard.