The Medici Effect
What Elephants and Epidemics Can Teach Us About Innovation
by
Frans Johansson
"If you can’t read it and come up with at least a minor Mona Lisa or two, you’re not trying."

—Entrepreneur Magazine
The Medici Family

• A banking family in Florence
• Funded creators from a wide range of disciplines
  – Artists, sculptors, scientists, poets, philosophers, financiers, painters, and architects
  – to come together to debate, discuss, and discover new ideas
  – They learned from one another, and broke down barriers between disciplines
The Result?

- A new world based on new ideas — the Renaissance
  - Late 14th century to the early 17th Century
  - Spread to the rest of Europe
  - Of 1,000 European artists, painters & sculptors during that period, about 350 of them had lived &/or worked in Florence, Italy
Two Types of Ideas

• Directional
• Intersectional
Directional Ideas

• Within the same field, on a directionally similar path
  – Most common
  – Most taught – Engineering, MBAs, Medical Schools
  – Within same body of knowledge
    • Refinements
    • Improvements
    • Enhancements
Directional Ideas
We Share Ideas

Directional Ideas
Intersectional Ideas

• Produce leaps along new directions
  - Surprising and fascinating
  - Open up entirely new fields
  - Create a space for a person or company to call its own
  - Generate followers – creators can become leaders
  - Sources for years of directional innovation
  - Can affect the world in unprecedented ways
Intersectional Ideas
Intersectional Ideas
An Intersectional Idea

• The challenge: Build an attractive, functioning office building that uses no air conditioning
  – In Harare, the capital of Zimbabwe
  – Temperatures in Harare can range from 88 (daytime) to 58 (night) in the same 24-hour period
An Intersectional Idea

• Perhaps a design based on how termites cool their towerlike mounds of mud and dirt?
  – Internal temperature controlled in a termite mound -- a constant 87 degrees -- to grow an essential fungus
  – Temperatures on the African plains can range from over 100 degrees during the day to below 40 at night
  – Termites direct breezes at the base of the mound into chambers filled with cool, wet mud
  – Redirect this cooled air to the peak
  – By constantly building new vents and closing old ones, they can regulate the temperature very precisely
The Result?

- Opened in 1996
- Largest commercial/retail complex in Zimbabwe
- Uses less than 10 percent of the energy consumed by other buildings its size
- Old Mutual (owner) saved $3.5 million immediately (first cost of a/c plant)
So, *Intersectional Ideas* Lead to Innovative Results
What Gets in the Way?

• It’s the difficulty of crossing barriers between fields – **Associative Barriers**
  – Instinctive associations, relative to our own experience
  – Assumptions
  – Training

• Thus, training, experience and industry knowledge all serve to raise associative barriers, leading to Directional vs. **Innovative** ideas
Associative Barriers

• Natural, cognitive barriers
• Evolution of the human brain
  – Find order in things
  – Group concepts together
  – Find structure in the surrounding environment
• Our “Problem Solving Skills”
  – Intuition
  – Logic
  – Quickly arrive at conclusions
  – Recall similar past situations and solutions that worked

Engineering? Medicine?
However,

Innovation requires Low Associative Barriers
How to Make Barriers Fall

• Mix a range of cultures or cultural experiences
  – Aqavit – A “Swedish” Restaurant
  – Chef Samuelsson – world experience

• Typical Menu items
  – CARAMELIZED LOBSTER with Seaweed Pasta, Sea Urchin Sausage & Cauliflower Sauce
  – SALMON PLATE with gravlax, spiced smoked salmon, espresso mustard sauce and goat cheese ice cream
  – ARCTIC CIRCLE DESSERT goat cheese parfait with blueberry sorbet and passion fruit curd
How to Make Barriers Fall

• Learn Differently – or provide different learning opportunities
  – Learning a new field
  – Hiring from outside the field
  – A variety of jobs, projects or hobbies
• Identify & value people who natively have low associative barriers
• Break out of your network
Breaking Out of Your Network

• Telecom R & D Engineer & Ecologist meet at a seminar
• Discussing how ants find food
  – “Foragers” are sent in random directions
  – The one who finds food returns first, leaving a trail of pheromones
  – Other ants are attracted, increasing scent of the trail
  – The quickest path emerges, based on the collective behavior of ants
Breaking Out of Your Network

• Applied to Telecom, a new message routing optimization algorithm emerged, using
  – Virtual Ants (messages)
  – Virtual Pheromones, left at routers along the way
• Engineer’s employer wasn’t ready for it
• He left the company and joined a Research Institute, developed “swarm intelligence” idea
• The company later adopted it, based on the idea’s development at the Institute
Reverse the Assumptions

• Take a situation, problem or concept, and think of the assumptions
• Write down the assumptions
• Reverse them
• Think about how to make the reversed assumptions meaningful
Creating a Restaurant

- Restaurants have Menus
- Restaurants charge for Food
- Restaurants serve Food
- A Restaurant with no Menus
- A Restaurant that doesn’t charge for Food
- A Restaurant that doesn’t serve Food
Sending Secure Electronic Messages

- Assume: a message is sent inside a “Locked Box”
- The receiver needs the same key
- If both are sent the same place, someone could intercept the key and unlock the box
- Reverse the assumption – what if both didn’t need the same key?
  - Receiver sends you (Sender) only the padlock instead – it snaps shut once, and no one else can open it (even you)
  - You return the padlocked box to the Receiver, who has the only key

Used in Electronic Commerce
“Public-key Cryptography”
(RSA Cipher)
Let’s consider a real situation

What are the Assumptions?
How to Make Barriers Fall

• Reverse the Assumptions
Randomly Combine Concepts

• Person in a room with two strings suspended from the ceiling
• Problem: Tie the strings together
• They’re too far apart to reach both
• Available tool: A pair of pliers
We Share Ideas
Randomly Combine Concepts

• Go on a “Thought Walk”
Thought Walk

- Problem: Remove ice from power lines
- Honey
- Honey pots on the poles
- Bears climb the poles
- Shake the poles
- Vibrates the wires – shakes ice off
- Helicopters
Let’s consider a real situation

Let’s Take a Thought Walk
Take on Multiple Perspectives

• Apply the idea to someone or something else
  – “become” another person
• Create Constraints
  – What if Customer Service can’t speak?
  – Or use their hands?
Let’s consider a real situation

What other perspectives can we take on?
An Explosion of Ideas

• Best predictor of great innovative ideas is the **quantity** of ideas generated
• Nobel Prize – Best predictor is number of publications
• Grants – Number of grant proposals
• We hear ~35% of Bach’s, Mozart’s or Beethoven’s compositions
• Most of Einstein’s papers have never been referenced
The dominant difference between successful and failed businesses, generally, is **not their original strategy**. Guessing the right strategy at the outset is not nearly as important to success as **conserving enough resources** (or having relationships with trusted backers or investors) so that new business initiatives get a **second or third stab at getting it right**.

*Clayton Christensen*

*The Innovator’s Dilemma*
Active Idea Generation

• You manufacture bricks, and want to find different uses for brick to improve your marketing efforts. Write down all the solutions that come to mind.

• Write down at least thirty uses for brick
Brainstorming

• Produce as many ideas as possible
• Produce ideas as **wild** as possible
• Build on each other’s ideas
• Avoid passing judgment on ideas

• Doesn’t work for most groups
  – Blocking – getting distracted by others
  – Cannot “store” and “produce” ideas simultaneously
  – Sometimes evolves into “problem-solving”, which raises Associative Barriers
Brainstorming that Works

- Start with a well-formulated problem statement
- Members generate ideas independently
- Present ideas in rotation
- Build on each others’ ideas
- No evaluation of ideas
Let’s consider a real situation
BrainWriting

• Start with a well-formulated problem statement
• Members generate ideas *independently*
• Write **one** idea on a sheet of paper, and place in center of table
• Take someone else’s sheet and build on their idea if you can, otherwise add another
• Read through all ideas, look for connections and build or add
How to Make Barriers Fall

• Reverse the Assumptions
• Take on Multiple Perspectives
• Randomly Combine Concepts
• Brainstorming (that works)
• BrainWriting
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