

BIOMIMICRY



Sustainable Business Strategies Inspired by Nature

Presentation by Gamelihle Sibanda

OUTLINE

- Biomimicry Primer
- Overview of the Biomimicry Process
- Biological Strategy emulation
- Examples of Biomimicry Applications
- Examples of Business Strategies Inspired by Nature

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A Biomimicry Primer

- Biomimicry?
 - from bios, meaning life, and mimesis, meaning to imitate.
- What is Biomimicry ?
 - conscious emulation of nature's creative genius
- Why Biomimicry?
 - 3.8 billion years of R and D

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Outline of the Biomimicry Process

- Define the challenge and the context
- Biologize the challenge
- Discover natural models of success
- Abstract deep principles
- Emulate best practice from nature
 - Evaluate against design criteria




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Built Environment – Termites – Eastgate Centre

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The Namib desert beetle utilises its surface texture and structure to convert air to water

Biomimics are creating synthetic surfaces that mimic the beetle's body technology and capture water from the atmosphere.

Water - Namib Desert Beetle –Water Harvesting Materials

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Water bears (tardigrade) can dry out and live some 120 years and wake up if rehydrated. Can withstand

1)-200 deg C to +151 deg C. 2) 1000 times more radiation 3) withstand 6 times pressure of deepest ocean

Inspired by the tardigrade's ability to dry out and function again upon re-hydration sugar stabilised anti-biotics that do not require refrigeration are now being developed.

Medical – Tardigrade – Unrefrigerated Antibiotics

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Pulling the Right Business Levers


- Ideal business traits
 - creative, alert, dynamic, adaptive, agile, resilient
- Niche Positioning
- Dimensions for change
 - Culture, People, Process, Product, Infrastructure

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Summary of Featured Organisms

1. Plant – Mesquite
2. Sea organism – Siphonophores
3. Mammal – Skunk
4. Mammal - Kangaroo
5. Bird – Black Heron
6. Reptile – Lizard
7. Insect – Ants that farm Aphids

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The Mesquite has deepest documented roots – transport water down to 70m where other plants cannot reach and recover the same when near surface water has dried up.

What perishable, seasonal or high demand products or resources can you preserve and be the sole supplier when your competitors are out of stock?

Mesquite plant

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A siphonophore colony is a composite animal composed of hundreds of individuals who change into various organs. The composite organism can reversibly degenerate to individuals.

Can you form a business where independent units can quickly aggregate into a well coordinated composite for strength and disaggregate into independent units for agility?

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Siphonophores

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If conditions aren't right the mother secretes a chemical that puts the embryo's development on hold (suspended animation). The embryo resumes growth when conditions are right.

Are you able to suspend operations (without repercussions) when conditions are not right and readily resume when right?

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Kangaroo

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A skunk fires a pungent liquid at attackers from behind. The stinking cocktail of chemicals clings to its victims and releases even more pungent smells when it reacts with water in the days that follow.

Can you provide your clients with great service or product and follow up with additional value addition that they were not aware of at the time of purchase?

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Skunk

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When fishing the African black heron holds its wings out over the water, making shade for fish. If a fish swims into the shade, the heron catches it.

Can you offer a free service of great value to potential clients and once you have a captured audience expose them to your products.

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Black Heron

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As soon as the lizard is grasped it casts off its fragile tail leaving the enemy with its tail which often goes on wriggling by itself, and thus distracts attention from the lizard while it is escaping. The tail regrows to its full length within a few weeks

Do you have something that you can sacrifice in order to distract the competition whilst you push the innovation envelope?

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Lizard

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Aphids feed predominantly on the sugary sap of plants. Ants love the excess sugar produced by aphids as waste. They farm and milk the aphids like farmers rare and milk cattle.

Can you produce waste products that are used as raw materials by others?

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Ants that farm Aphids – Cradle to Cradle

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