



ENGINEERING DESIGN PROCESS

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Video Reference: <https://www.youtube.com/watch?v=6mFmR535Xkk>

Frugal Innovation

Frugal innovation is the process of reducing the complexity and cost of goods and its production in a scalable and sustainable manner. It's a whole new way of thinking about not just innovation but about value creation.

- ❖ Targets the customer's hidden aspiration or unvoiced problem
- ❖ Represents a move from a linear model to circular models of innovation
- ❖ Constitutes a collaborative approach to innovation
- ❖ Is a complementary approach to traditional R&D

Frugal Innovation Examples

Embrace Infant Warmer

Embrace infant warmer consist of three main parts.

A

Accutemp Heater:

The AccuTemp heater is used to warm the WarmPak.

B

Baby wrap:

Baby wrap is the place to hold the baby and it has been designed keeping in the mind comfort and sanitation of baby.

C

WarmPak:

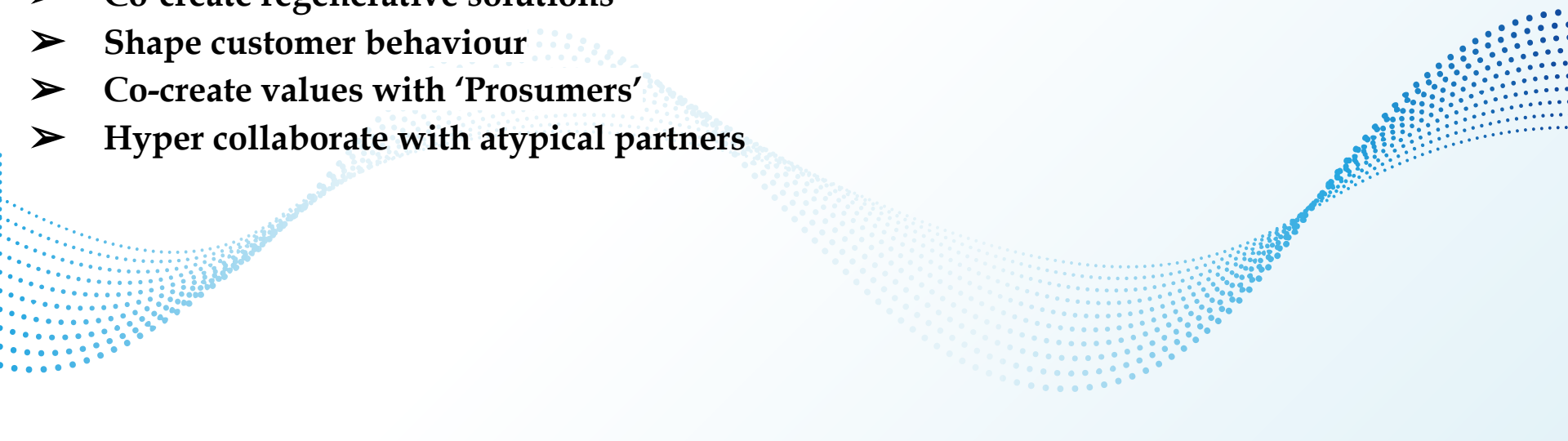
WarmPak contains a special phase change material which maintains the constant temperature of 37°C.



Mitticool



THE SIX PRINCIPLES OF FRUGAL INNOVATION

- Engage and Iterate
 - Flex your existing resources
 - Co-create regenerative solutions
 - Shape customer behaviour
 - Co-create values with 'Prosumers'
 - Hyper collaborate with atypical partners
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Principle 1: Engage and Iterate

- It's includes early involvement of customer, interactive prototyping and analytics.
- Old models of top-down R&D can be time-consuming, inflexible, and often miss the mark; end products tend to be complex to buy, use, and maintain. Continuous customer engagement and iteration are called for, as shown by "follow-me-home" visits by Intuit to better understand customer needs.
- Toronto-based crowdsourcing site SoapBox has helped Cisco and GSK Canada systematically get ideas and ratings; SmartScan uses social media mining for customer insights.

Principle 2: Flex your existing resources

- Frugal approaches can be applied across the asset chain: manufacturing, distribution, services, and even people.
- The trend towards mass customization, new tools (such as robotics and 3D printers) and new approaches (such as social manufacturing and continuous production) can help operations and supply chain managers 'flex' their production, logistics and service assets to satisfy demanding customers better and more cheaply.
- The goal of flexing assets is not only about saving resources, such as carrying less inventory, but also about saving time – a business's most valuable resource.

Principle 3: Co-create regenerative solutions

- It has bold audacious goals, cradle-to-cradle design(circular economy), waste 2 wealth, multi-purpose products, sustainable ecosystems, regenerative business.
- **For example:** Flooring and carpet solutions company Tarkett uses oyster and walnut shells, closed-loop water systems, and re-purposes industrial waste. It also recycles some products of other manufacturers.

Principle 4: Shape customer behaviour

- While many customers already embrace frugal principles, more need to be nudged along the way to increase awareness and motivation.
- Such as Full-cycle carbon reduction needs to include consumption patterns, not just production. People need to not just consume less, but consumer better.
- There are **Care4Today** app which helps patients stay on schedule with their medication and **GlowCap bottles** have caps that glow, play music, and even alert designated friends when patients forget to take their pills.

Principle 5: Co-create values with 'Prosumers'

- It is important not just to identify customer needs but also sense their dreams. Customers play an important role as dreamers (Volkswagen getting futuristic ideas from China), validators (Hasbro and customer voting on rules for board games), ideators (Lego opening up toy robot code), makers (Kimberly-Clark grants for mompreneurs) and much more.
- Involving customers in the production process provides a sense of ownership, contributing to overall brand influence on social media and building brand communities.

Principle 6: Hyper collaborate with atypical partners

- Hyper-collaboration with partners, suppliers, startups, government and even competitors is another pillar of frugal innovation as Adversity fuels the creativity of entrepreneurs.
- For example, tech giants from around the world are setting up innovation centres in Silicon Valley. American Express Ventures is investing in startups that help manage money better. Industrial symbiosis is practiced by companies like Statoil and Gyproc, to exchange material waste and byproducts.

Frugal Innovation for SMEs



According to the definition given by Harvard Business Review, **“Frugal Innovation is more than a strategy”**. Some Keywords such as low-cost innovation, good-enough innovation, resource-constrained innovation, taking all these definitions and applying them to the Small Medium Enterprises (SMEs), is therefore a completely different arena from where Frugal innovation has originated, has been a challenging yet very interesting concept. The constraints of SMEs in the innovation realm, primarily R&D budget, human resources excellence and availability, and numerous other constraints when compared to larger enterprises, have already been described however the Frugal innovation point of view shows how SMEs can overcome those same constraints at their own advantage. Smaller companies **“with comparatively tiny budgets often manage to out-innovate the bigger, established competitors”**



THANK YOU!

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