Circular Innovation Framework

Circular Innovation Framework

There's an urgent need to reimagine how businesses can be regenerative rather than exploitative, how new products, services, and systems can be created to keep materials and nutrients at their highest possible value, and how pollution can be designed out to close our waste loops.

How can businesses become more circular, less wasteful and more sustainable? We believe circular innovation holds the key!

Below we outline three attributes of circular innovation that can be put into practice by entrepreneurs and designers who want to accelerate the transition towards a circular economy.

Performance Driven

Nutrient Aware

Nature Inspired

In addition to the examples listed in this document, we have also worked with young innovators in the Asia-Pacific region who used this framework to come up with circular business ideas. Their innovations can be found on our website.

Performance Driven

A performance driven innovation extends product life, encourages repair, and focuses on delivering the highest quality of service. It makes the consumption of resources such as energy, water and materials more efficient. Existing assets such as buildings, vehicles, parking lots and roads are also optimally used.

Making performance the primary offering for economic transactions, rather than products, can make an innovation circular. However, selling 'performance' also requires business model innovation that changes incentive structures for businesses. This could mean offering a 'pay-per-wash' service instead of selling a washing machine or dishwasher. Or it could mean selling 'lumens' instead of light bulbs, or 'rest hours' in place of sleeping mattresses.

Rather than offering 'ownership', businesses would offer 'access' to a product or service. This is also known as product-as-a-service (PaaS). Innovations spur from understanding what jobs people need to get done and providing services that will get them done.

Performance
Driven

Example #1: Uber

“Uber is a technology company whose mission is to reimagine the way the world moves for the better. Our technology helps us develop and maintain multisided platforms that match consumers looking for rides and independent providers of ride services, as well as with other forms of transportation, including public transit, bikes, and scooters.

We also connect consumers and restaurants, grocers, and other merchants so they can buy and sell meals, groceries, and other items, then we match them with independent delivery service providers.”

LEARN MORE

Example #2: Signify

“We take care of your lighting, so that you can take care of your business. From the initial design and installation to operation and maintenance, we’ve got you covered. You get the service levels you deserve, and the system performance we’ve agreed.

With LaaS (Light as a Service), you can generate instant savings and optimize your cash-flow from day one.”

LEARN MORE

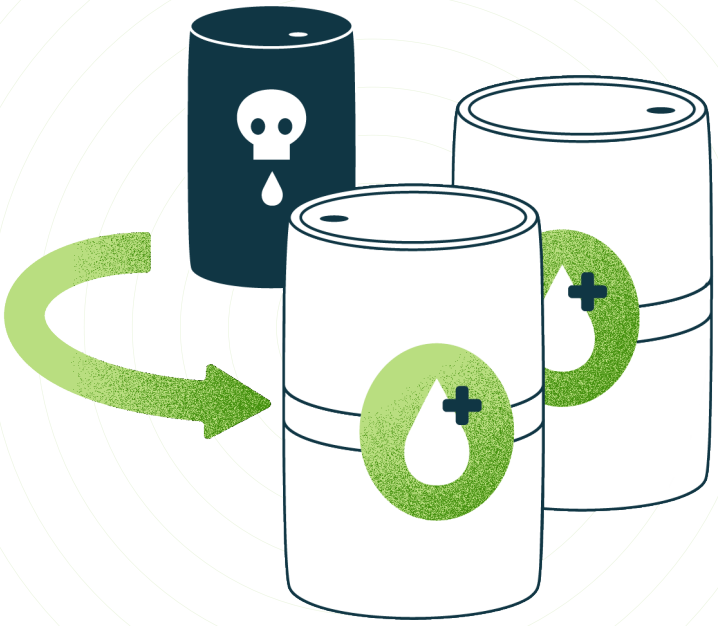
Performance
Driven

Example #3: Watasumi

“Watasumi creates specialized technology that uses microbial communities to treat high-strength industrial wastewater from the food and drink industry. The treatment process uses energy within the wastewater itself, making the system sustainable.

Our approach uses modular units for decentralized installations and easy installation and maintenance. We provide leasing services for getting your systems up and running quickly.”

LEARN MORE



Nutrient Aware

Nutrient awareness means you define all transactions in the context of technical and biological nutrient stocks and flow. A perfectly circular innovation cycles all technical nutrients in lean, infinite loops at their highest value. All biological nutrients are safely returned to the earth for future use.

Technical nutrients include concrete, metals, rare minerals, recyclable chemicals, wood, high-quality plastics and glass. Biological nutrients include food scraps/surplus, other biodegradable waste from green spaces or agriculture, and the organic compounds contained in waste effluents from households, industries and commercial buildings.

A nutrient aware innovation can use digital technology to create ‘material passports’ that document and store information about embedded technical nutrients in the assets associated with a product, service or system. Tracking nutrients also provides assurance about their origin and quality.

A key to the reuse and upcycling of nutrients is to create trust about the nutrient by making it completely traceable. Technologies like IoT and distributed ledgers allow nutrient traceability. Buildings, vehicles, printers, refrigerators and other such products can be viewed as large banks of technical nutrients. Digital ‘passports’ for these material banks allow the recovery and trading of not just the materials when the assets are decommissioned, but also the embodied energy, water and labour in them.

Example #1: Maersk

“Cradle to Cradle Passport: A first step towards full vessel recycling… A document that describes all materials used to build the Triple-E ships and how to disassemble and recycle them… The expected benefits: Reduced lifecycle environmental impact; Higher resource availability in the long term; Higher recycle price for vessels (estimated 10% higher); Easier to ensure compliance with regulation; An incentive to ensure responsible recycling.”

LEARN MORE

Example #2: Muuse

“We work with 100+ cafes, corporates, and cities to co-create an affordable network of reusables cups and food boxes. So far, we’ve saved 50,000+ single-use items across Hong Kong, Singapore, Toronto, and San Francisco.

Our user-facing app and smart inventory system allows us to track our tech-enabled products throughout their entire life-cycle. Having achieved a return-rate of almost 99%, our proprietary expertise can extend beyond F&B to make sustainable convenience a reality for multiple consumer products.”

LEARN MORE

Example #3: Fairphone

“To gain a deeper understanding of the complex, often opaque consumer electronics supply chain, we’re mapping all the different materials, suppliers and manufacturing locations involved in creating our phone. In addition to our first-tier assembly manufacturer, we have now mapped all second-tier component suppliers, and are progressively researching third and fourth-tier suppliers. Besides increasing transparency, we’re using this information to engage with individual suppliers, establish relationships and pioneer innovative solutions in our impact areas…”

LEARN MORE

Nature Inspired

There is no ‘waste’ or ‘pollution’ in nature. In natural ecosystems, the output of one subsystem serves as the input to another. A nature inspired innovation uses biomimicry to design and engineer truly sustainable products, services and systems that draw insights from nature’s 3.8 billion years of research and evolution.

For example, Darkling Beetles in the Namib Desert harvest water from the moisture present in the air using nano-scale structural patterns on their body. New water harvesting technologies are using these beetles as inspiration to harvest pure, safe drinking water. Another source for inspiration are peacocks: the bright colours of their feathers are not due to pigmentation but due to surface patterns that reflect light and create the colours we see. Such surface patterns could replace toxic paints that colour our buildings, automobiles and products.

Nature inspired innovations use safe and healthy materials that can be safely returned to the Earth. They use biology and chemistry to forge new products and contextualise innovation based on local conditions and resources. The natural world can also be a source of inspiration when designing processes and systemic interventions.

Nature
Inspired

Example #1: Notpla

“Notpla is made from one of nature’s most renewable resources, brown seaweed. Growing up to 1m per day, it doesn’t compete with food crops, doesn’t need fresh water or fertiliser and actively contributes to de-acidifying our oceans.

Most people don’t know that 50% of plastic packaging is used once and thrown away. Notpla biodegrades naturally in 4-6 weeks. No micro-plastics, no waste for centuries. Unlike PLA, it is home compostable and doesn’t contaminate PET recycling.”

LEARN MORE

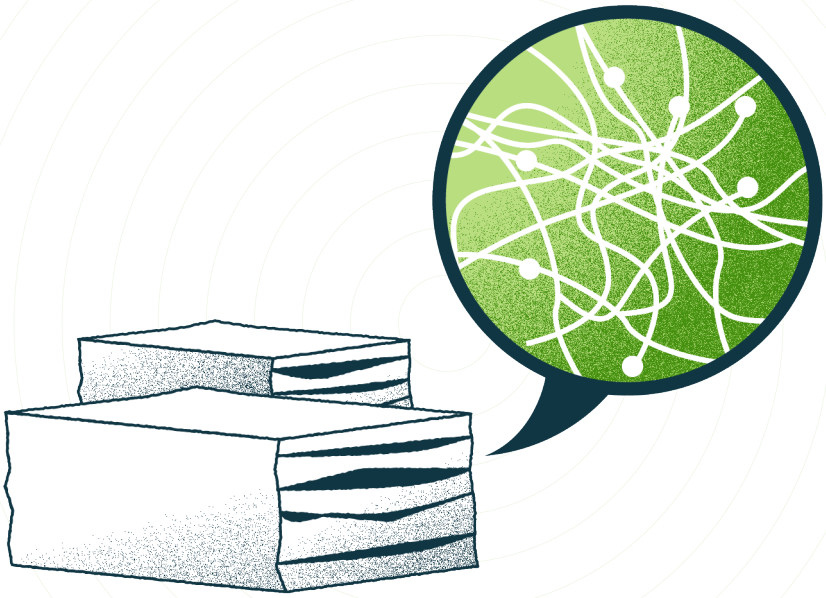
Example #2: Biohm

“We have produced a mycelium insulation panel that will be the world’s first accredited mycelium insulation product. We are also developing new products and alternative applications for mycelium.

Mycelium not only outperforms petrochemical/plastic based construction materials in thermal and acoustic insulation but, as a natural material, it is also safer and healthier. Mycelium does not contain the synthetic, resin-based compounds that can cause harmful toxic smoke and the quick spread of flames during a fire.

To grow our mycelium, we identify commercial and agricultural by-products that would otherwise go to landfill.”

LEARN MORE



Example #3: PEEL Lab

“We are a Japanese B2B startup with a vision: upcycling food loss, preventing animal cruelty, and stopping global warming.

That’s why we made a new kind of leather out of what would usually be thrown away, using fruit peels from juice factories. PEEL Lab leather is plant-based, sustainable and ethically produced from the same material found in nature. More than just an alternative to leather, it actually contributes to the environment by reducing waste, emissions and other pollutants that impact our planet.”

LEARN MORE