



CHOP VALUE

Impact Report

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ChopValue Impact Report And Team Assignment

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1. Sustainable Development Goals

ChopValue's circular economy business model tackles nine of the United Nations Sustainable Development Goals (SDGs). Of these impact areas, SDG12: Responsible Consumption & Production (SDG12) stands at the forefront of ChopValue's impact generation. Roughly 1.4B people throw away 80B pairs of chopsticks on an annual basis, loading landfills and emitting vast amounts of stored carbon into the atmosphere (Tran, 2016).

This is highlighted by ChopValue's mission statement to "transform & elevate waste resources into new materials and valuable products" (ChopValue, n.d.). SDG12 is ingrained into ChopValue's business model as exhibited by the direct correlation between sales and impact generated as every product purchased diverts waste and carbon emissions.

SDG12 also promotes the circular economy, a core focus of ChopValue's business model and impact thesis. Decisions concerning ChopValue's supply chain, manufacturing, and distribution processes are targeted at maximizing total environmental impact across the entire product life cycle to minimize Net Carbon Output (Exhibit 1). These environmental sustainability considerations include emphasis on transportation emissions, minimizing water reduction, biodegradable packaging, and energy consumption.

2. Innovation

Felix Böck, a German-Canadian carpenter and engineer, founded ChopValue in 2016. Böck's specialization with structural bamboo led him to the realization that a pair of single-use chopsticks could be a perfect medium to tackle the construction and waste industries' urban wood waste issue (Forbes, 2019).¹

Carbon emissions directly contribute to climate change, with exposure to air pollution causing 7M deaths per year, and around \$5.11T in welfare costs worldwide (United Nations, n.d.). Bamboo chopsticks have a carbon dioxide retention rate of 46% by weight; recycling them instead of leaving them in landfills prevents their biodegradation, which would release their stored carbon back into the environment and contribute to the ongoing climate crisis.

ChopValue, piloted in over 10 countries on a local microfactory operating model, harvests single-use bamboo chopsticks from restaurants and malls to be upcycled into home decoration, furniture, and office utility products (Exhibit 2). ChopValue's model intends to bring innovative environmental and economic benefits to the communities they operate in as their supply chains are deglobalized through their local microfactories.² This allows ChopValue to reduce transport emissions and empower local community members (ChopValue, 2019).

ChopValue implements a circular economy by using recycled chopsticks to produce new products. Their recycling process captures carbon, resulting in a carbon-positive manufacturing process. Finally, by leveraging global growths in chopstick use and Asian food consumption, ChopValue works in a fast growing business segment with strong revenue upsides to support their waste-reduction and community-empowerment mandates.³ To date, ChopValue has diverted 15.5M chopsticks and 40,000 kilograms of waste from landfills, while saving 21,492 kilograms of CO₂ in functional products (ChopValue, 2019).

1. Bamboo regenerates within 3 years and sequesters up to 10x more carbon than traditional wood (Weeden 2020).

2. "ChopValue's distributed manufacturing concept can be defined as the lean manufacturing of high-value products under shared ownership, using locally available resources in an effort to minimize the environmental footprint and maximize business opportunities from local resources that are otherwise not profitable." (ChopValue, 2020)

3. Asian fast food consumption increased by 135% between 1995-2015 (Perkins, 2019).



3. Intersection of Interest

Our team found resonance in understanding ChopValue as a manifestation of Felix Böck's journey as a social entrepreneur. As future leaders, we believe our commitment to foster impact will require us to face tribulations similar to Böck's.

Visionary

Böck's visionary mindset and creativity fostered ChopValue's core tenets of sustainability and design-thinking. These values are foundational to ChopValue's success at scaling and reimagining the circular economy and social franchising model.

Growth

ChopValue's rapid growth is leading them towards opportunities in uncharted territory. Their mainstream appeal and Böck's desire for global expansion presents competing priorities between maintaining his sustainable business model while scaling ChopValue's operations.

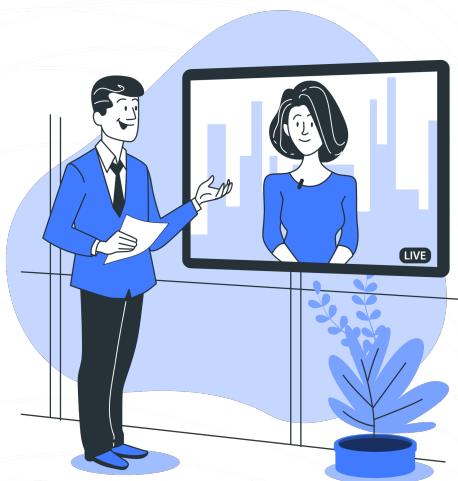
Leadership

Böck and ChopValue are at a crossroad between innovation and tradition. They are bridging the gap between conservative industries, such as engineering and manufacturing, and social innovation. This intersectional thought leadership is integral to changing the narrative of how impact can be integrated in traditional business models.

4. Filter

ChopValue's ability to divert millions of chopsticks from becoming waste is achieved through partnerships with local businesses (recycling partners) to minimize the environmental footprint of the production process. Frequent recycling partners include restaurants, airports, and shopping malls in North America that supply ChopValue with used chopsticks. ChopValue fosters meaningful relationships with these partners by offering

circular economy training for their employees and conducting recycling services free of charge. The provided educational opportunities spark innovative thinking around resource repurposing and promotion of non-linear economic models. ChopValue's emphasis on creating a collaborative manufacturing ecosystem aligns with our team's values of community interconnectedness and building information symmetry. In addition to ChopValue's focus on community creation, they advocate for business transparency in environmental impact reporting. Their dedication to raising awareness and promoting accountability adds credibility to the venture and further provides opportunity for critical analysis of their production processes' impact generation. Accurate reporting practices are a stepping stone to create real systems change.



5. Future

ChopValue demonstrates how social innovation fits within traditional capitalism. Their impact model converges the benefits of value creation and environmental preservation. ChopValue's specialized production process of using one up-cycled material input achieves operational efficiency and economies of scale. While they are not completely mainstream, they are pushing towards traditional retailers, like Nordstrom and Simons, expanding both their reach and impact.

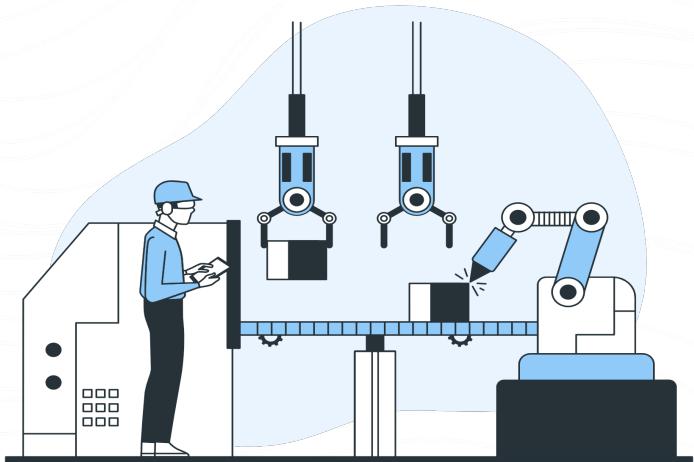
6. Foresight

ChopValue provides a system changing approach for communities through their unique microfactory franchising model. The environmental and social benefits of this model encourages industry-wide structural change and impact generation. The locality of microfactories reduces transportation emissions and carbon output. As communities are looking for ways to create sustainable growth and meaningful economic opportunities, microfactories provide an opportunity to take a localized approach to invest back into the economy. By using a franchising model, people are able to participate in shared ownership, create employment opportunities, and derive other socio-environmental benefits.

7. Impact

7.1. Im → Possible & Un → Broken: Social Franchising Model and Systems Change

ChopValue conducts social franchising through licensing their microfactory production process (Exhibit 3). Social franchising allows organizations to scale their solutions into new regions and create impact outwards where it can be adapted to local contexts. This model expands influence and impact while encouraging stakeholder collaboration in the production process. ChopValue's microfactories establish a broader network of suppliers and complete vertical integration of the supply chain. Impact is accomplished earlier in the manufacturing stage of the supply chain by diverting waste and offering meaningful employment to underserved communities.



ChopValue's social franchising strategy aims to amend traditional barriers of entry such as high upfront start-up costs. ChopValue guarantees the purchase of all finished goods from the factories and conducts onsite training. Using Donella Meadows' Theory of System Change, ChopValue's effectiveness is based on targeting a leverage point earlier in the production process (Meadows, n.d.). Instead of focusing on exclusively making material input changes, they create systemic change through their work to shift the goal, mindsets, and paradigms of the system (Exhibit 4). Their model is based on mutual aid and shared social agreements between ChopValue, their recycling partners, and those who run microfactories. This nudges the rules of the current economic system to become more focused on the collective.

Looking forward to ChopValue's expansion plans, they will need to adapt their financing options to increase flexibility for global community partners in disenfranchised locations. Communities that would benefit most from building a factory may not have the access to capital, credit history, or banking services to receive mainstream debt funding thus, limiting the viability of this expansion model and the overall impact. Additionally, ChopValue only focuses on chopstick diversion and has not considered the adoption of different inputs that better align with different local contexts. The use of chopsticks as a production material may only be valuable within specific regions, reducing the replicability of their model.

7.2. Re -> Valued: B Corp Valuation

ChopValue earned their B Corp certification in January 2021 with a score of 111.0 (Exhibit 5) (Certified B Corporation, 2021). ChopValue is the B Lab's first certified company with a circular economy franchise business model. The company outperforms their peers by over 10 points despite the -2.89 point difference in average scores under Version 6 of the B Corp assessment model (Certified B Corporation, n.d.). The company excelled at Environmental and Community impact with scores of 49.9 and 32.4 respectively, for their contributions to 'Local Economic Development' and 'Resource Conservation.'

ChopValue does not rely on the B Lab to execute its business model but views the certification as a benchmark to measure the company's growth (Böck, 2021). Böck believes that the global standard and brand recognition of the certification will attract larger investors to ChopValue and increase external accountability for their practices as they scale. The B Lab's extensive network, B Corp recertification requirements, and ChopValue's pre-existing internal carbon assessment model will help ChopValue continue to use impact metrics to guide business decision making. Continuing to track impact as ChopValue expands, will ensure that the company remains mission-aligned.

8. I-m-pact

8.1. Future-Making: Shared Learnings

When considering how to replicate ChopValue's business model across time and space, it is important to take into account the various capabilities and resources that are necessary for success. ChopValue has been successful due to their cultivation of strong symbiotic relationships and connections with community partners, implying that having a strong network is an essential factor for replication success. Additionally, ensuring that there is an inherent social need present within microfactory franchise locations allows for strong community involvement and adoption. By screening new locations for key characteristics such as distribution feasibility and input and capital accessibility, chances of long-term business model sustainability and impact can be maximized. Looking forward, other materials can be substituted into the business model to create new products and generate further impact.

8.2. World-Making: Our Values

While social franchising is not a new concept, ChopValue's dedication to community building and access to opportunity creates an additional layer of impact that we had not foreseen. ChopValue highlights the importance of finding innovative impact mechanisms and implementing them on a large-scale. Additionally, their dedication to individual capacity building in these communities creates a positive feedback loop in which more people are engaged and a part of the systems change process. Since our group's values converged in creating information symmetry and providing space for those who do not traditionally have it, ChopValue was an inspiring example of how both can be accomplished through an expansion model.



Scalability is a common challenge for social enterprises but ChopValue provides an example of how to grow effectively. Our final reflection is understanding how ChopValue's business model highlights the potential for social enterprises to scale their operations while integrating opportunities for impact throughout the value chain. ChopValue's strong impact model, agile innovation, and openness to improvement are why they will lead the frontier for sustainable social enterprise expansion.

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10. Exhibits

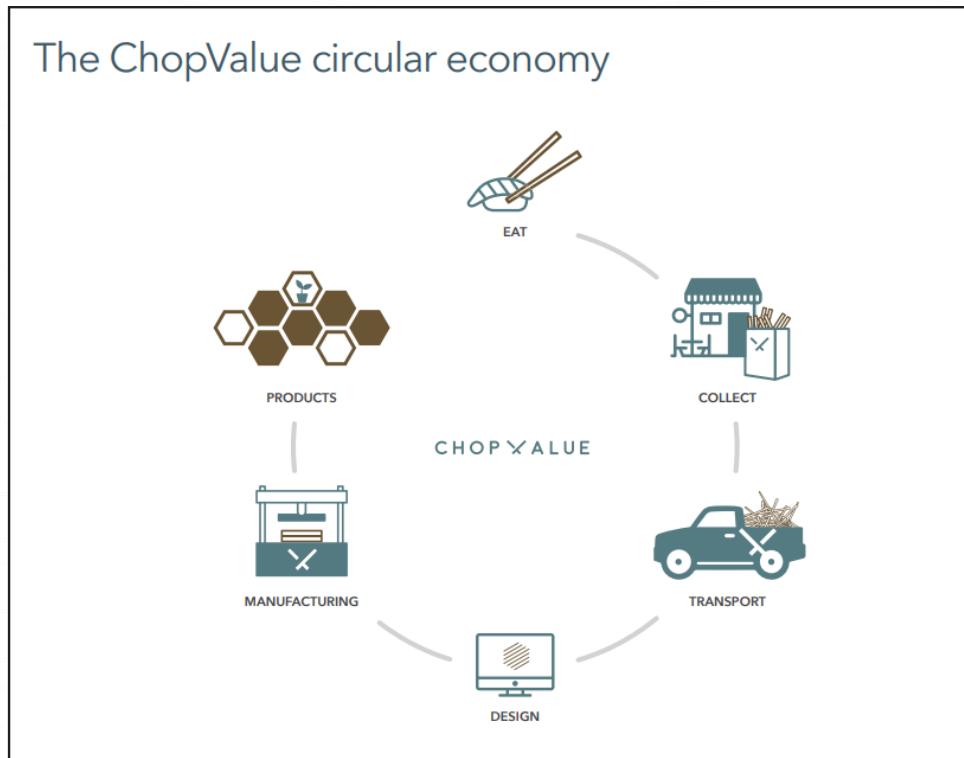
Exhibit 1: ChopValue's Net Carbon Output Assessment

| Equations for calculation | |
|----------------------------------|--|
| The How | |
| Number of Chopsticks | $\frac{\text{weight of chopstick collected}}{\text{average weight of single chopstick}}$ |
| Emmisions per Chopstick | $\frac{\text{Total operational emissions}}{\text{number of chopsticks collected}}$ |
| Retention Capacity per Chopstick | $\text{Average Weight Single Chopstick} \times \text{Carbon Stored by Bamboo}$ |
| Overall Emissions | $\text{Average Weight Single Chopstick} \times \text{Carbon Stored by Bamboo}$ |

Source: https://za-jimej.se/wp-content/uploads/2019/08/ChopValue-Urban-Impact-Report-2019.pdf?fbclid=IwAR-3wmRZvDftHay-ihy-UGQEiOKz_Xb1y-SC7KQls2KBtk-puGX-iEOjuulag.

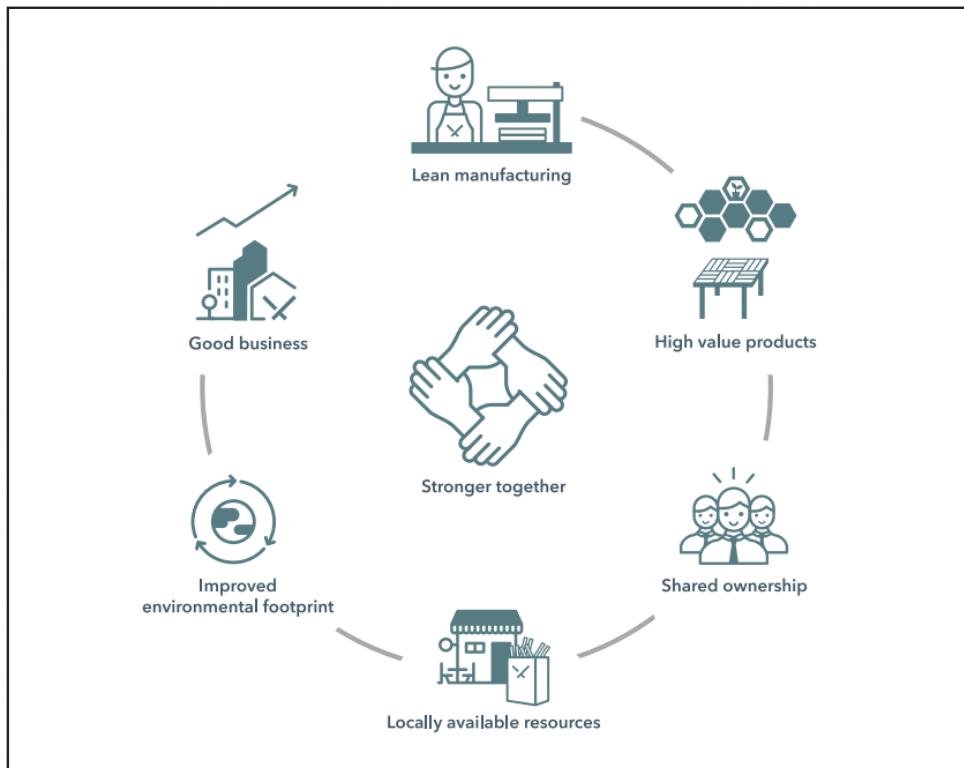
| | | | | | | | | | |
|---|--|---|--|--|---|--|--|---|---|
| 3.0 Emission sources Within the ChopValue Process | 01 Chopstick Collection ChopValue partners with various restaurants, malls, and office cafeterias to collect used chopsticks. The collection program is free of cost to the recycling about our mission. Chopstick collection is conducted twice a week using the ChopValue gasoline-fueled truck. The route travelled on these two days is generated via software to ensure the distance travelled, and resulting carbon dioxide emission, is minimised. The routes travelled by the collection driver are recorded and used to calculate the emissions from this step in the process. Emission Sources: Distance travelled by the ChopValue truck. | 02 Chopstick Sorting Once the chopsticks are collected, the chopsticks are sorted at the facility. The sorting table is used to align the chopsticks in a single orientation for subsequent batches of chopsticks. Since the resin used in the process is free of the toxins found in other conventional resins, such as formaldehyde, the process of applying adhesive to the chopsticks has no adverse environmental impact. Emission Sources: Electricity consumed by the sorting table | 03 Adhesive The sorted chopsticks are dipped into a water-based, formaldehyde-free resin. The excess resin from chopstick dipping is recycled and used to coat subsequent batches of chopsticks. Since the resin used in the process is free of the toxins found in other conventional resins, such as formaldehyde, the process of applying adhesive to the chopsticks has no adverse environmental impact. Emission Sources: None | 04 Drying The resin-coated chopsticks are placed into a convection dryer. Research was conducted to determine the minimum drying time required for the chopsticks to reach the target moisture level required for pressing to ensure that the emissions from this process are minimised. Emission Sources: Electricity consumed by the dryer. | 05 Densification The dried chopsticks are densified into tiles using a heated hydraulic press. This hot press was designed by the ChopValue Engineering team and is customised to meet their needs in terms of production time, efficiency, and cost. The high heat and pressure results in chopstick compaction and reduces the volume of the high density material ready for product manufacturing. | 06 Product Manufacturing: The tile is planed and cut into standard dimensions before being used to manufacture a product, and this standard tile is then processed based on the product being manufactured. There are several measures taken to reduce material waste during this step. Different products require different tile thicknesses. Therefore, the remaining material from one product is used to make another. This is done by using a large industrial wood-based mixed press tiles into three different thicknesses. By doing this, products with thinner dimensions are created using the thinnest tile produced by the press. Additionally, the offcut tile scrap resulting from product manufacturing are used in the production of smaller products such as keychains. Emission Sources: Electricity consumed by the woodworking machinery. | 07 Finishing: After the products are manufactured, they are coated in a vegetable-based and environmentally friendly oil, which emphasizes the material's natural colour. This is the standard finish applied to most products at ChopValue; however, different product applications may require different surface finishes that may result in different environmental impacts. Emission Sources: None. | 08 Packaging: All ChopValue products are packaged using starch-based sustainable packing peanuts, and all labels and cards are printed on 100% recycled paper. Emission Sources: None. | 09 Product Delivery We encourage customers to pick up their orders from our production facilities to minimise our emissions; however, under special circumstances, the ChopValue truck is used in the delivery of larger products. The mileage associated with such deliveries is tracked and used in the calculation of process emissions. Emission Sources: Truck mileage during delivery. |
|---|--|---|--|--|---|--|--|---|---|

Exhibit 2: ChopValue's Production Model and Circular Economy



Source: https://za-jimej.se/wp-content/uploads/2019/08/ChopValue-Urban-Impact-Report-2019.pdf?fbclid=IwAR-3wmRZvDftHay-ihy-UGQEiOKkz_Xb1y-SC7KQls2KBtk-puGX-iEOjuulag.

Exhibit 3: ChopValue's Microfactory and Social Franchising Model

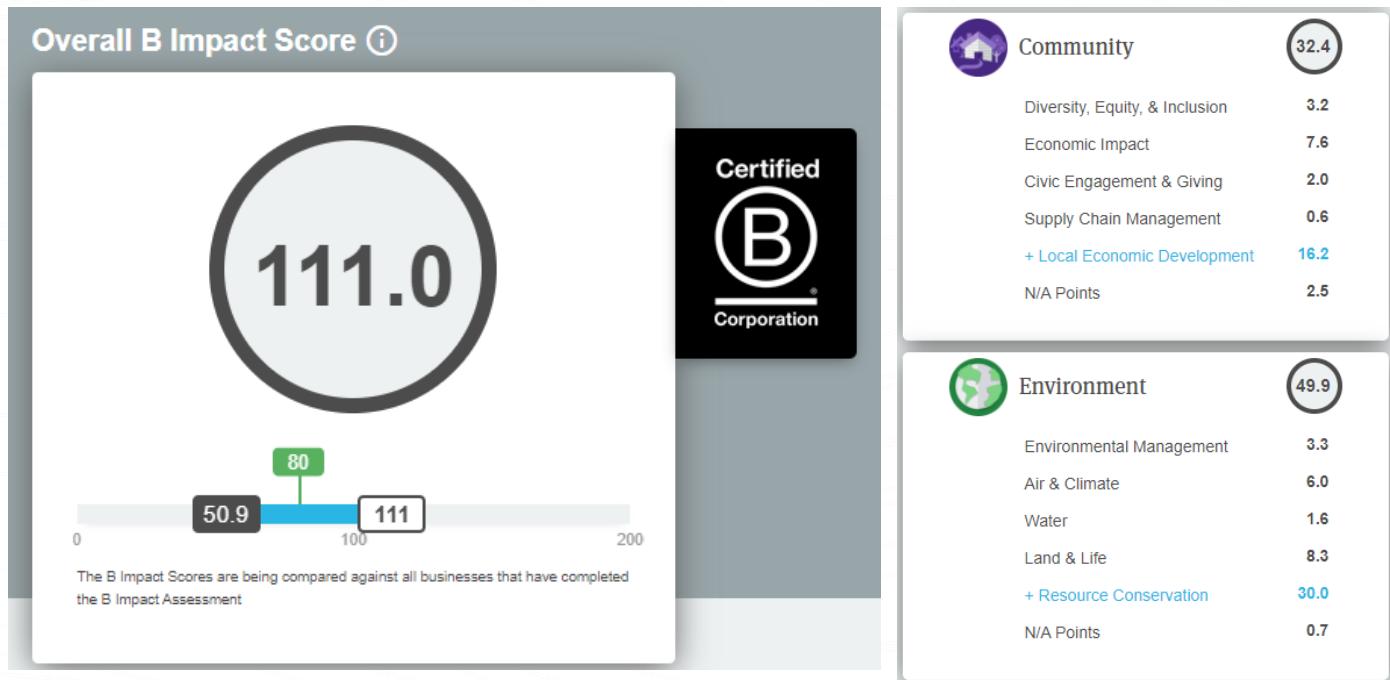


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Exhibit 4: Meadows' Theory of System Change

- | | |
|-----------------------------------|--|
| Achievable without microfactories | 12. Constants, parameters, numbers (such as subsidies, taxes, standards). 11. The sizes of buffers and other stabilizing stocks, relative to their flows. 10. The structure of material stocks and flows (such as transport networks, population age structures). 9. The lengths of delays, relative to the rate of system change. 8. The strength of negative feedback loops, relative to the impacts they are trying to correct against. 7. The gain around driving positive feedback loops. 6. The structure of information flows (who does and does not have access to information). |
| Achievable with microfactories | 5. The rules of the system (such as incentives, punishments, constraints). 4. The power to add, change, evolve, or self-organize system structure. 3. The goals of the system. 2. The mindset or paradigm out of which the system – its goals, structure, rules, delays, parameters – arises. 1. The power to transcend paradigms. |

Exhibit 5: ChopValue's B Corp Evaluation



Source: <https://bcorporation.net/directory/chop-value-manufacturing-ltd>