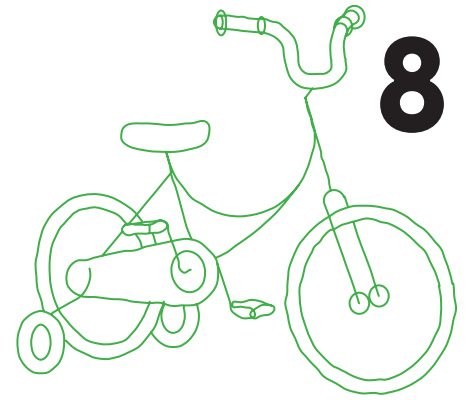


Bike factory



Description of the business

Context

Several studies have proved it: in urban areas, cycling is the most efficient way to get around (the average speed of a car at rush hour is 14 km/h. With no training, cyclists travel at 10 to 15 km/h). The positive effects are numerous: it improves the health of regular cyclists, reduces fine particle pollution in urban areas (which kills over 7000 people every year in Belgium) and even decreases congestion for those who have no choice but to travel by car.

Like other major European cities, Brussels has gradually made its urban environment more cyclist-friendly: opening of all one-way streets to bikes ("SUL", or limited one-way streets), permission to ride through red lights when it is not dangerous to do so (B22 and B23 signs), and constant expansion of the network of cycle lanes. The last of these elements has also been strengthened significantly during the coronavirus crisis, particularly on main roads.

This substantial ongoing improvement in urban infrastructure, often cited as the number one barrier to city cycling, has boosted the appeal of the bike. So now is the time to equip every household in Brussels with a cycle, taking into account a specific set of challenges, including:

- Purchase price, which can be relatively high for certain brands, with users often struggling to calculate the total cost of use of the bicycle over its lifespan;
- The terrain of Brussels, which is relatively hilly, making "Dutch" bikes (which require practically zero maintenance) largely unsuitable;
- The lack of street level bike parking in Brussels, which means users often have to store their cycle at home - a problem in urban houses with narrow corridors, and worse still in apartments;
- The multipurpose nature of the bike, which may be used to commute, carry shopping and transport children, while being lightweight enough for weekend leisure rides.
- Finally, the weather: even if cycling organisation GRACQ insists that Belgium experiences less than 15 "uncyclable" days a year, it is still viewed as a major barrier.

Industrial Activity

The idea is to produce adaptable bikes, guaranteed to last, with an offbeat urban style. A "uniquely Brussels" model, a kind of Brussels bike, similar to a Dutch bike but designed for our city and its challenges.

A single bike that can be tailored to meet the needs of its user, with electric assistance and an (optional) cargo section for shopping. Another interesting option would be to create something more akin to a mini-car, which would be weatherproof and multifunctional, offering shelter from the rain and three or four wheels for added stability (a detail that will reassure many novice and elderly users). Several initiatives of this type have flourished in recent years, particularly in the Nordic countries.

The business model could be based around three areas:

1. direct sale via a network of dealers;
2. A “functional” option, either on a monthly rental basis, like (Swapfiets), or self-service (like the existing Villo bikes).
3. A children’s range, with the option to swap the bike for a larger one as the child grows (see Les Ateliers de la Rue Voot and their “a bike for 10 years” project).

With regards to point 2, it is worth noting that the bike-share approach resolves the cycle parking issue while eliminating all risk to the user (theft, damage).

The business activity would require the following:

- A bike assembly workshop, and potentially an additional workshop for refurbishing metal (aluminium and steel)
- An additional workshop for servicing and converting bikes according to their use, making it possible to provide an integrated long-term service
- A fleet management and maintenance service, if a hire option is offered and managed in-house
- There is also the question of whether you need a shop for customising bikes to suit their user, or perhaps a showroom (similar to Cowboy, on the banks of the canal).

Technical feasibility

The technical feasibility of producing a bike is not in question, especially if it is designed with sustainability in mind, rather than the latest technology. However, designing an innovative, flexible, multipurpose model presents clear technical challenges. And if you plan on adding electric assistance to encourage frequent use, it becomes yet more complex: bear in mind that the bio-hybrid model from Schaeffer required 4 years of R&D.

First Elements to be analysed by the project team

- Consider what type of bike to develop. To this end, it is useful to:
 - Explore all products already on the market;
 - Consider the potential for a partnership, perhaps with a local brand;
 - At the same time, research the needs/wants of people in Brussels.
- On the basis of this, you can explore technical factors in greater detail and determine the production method, and identify potential local suppliers of raw materials, etc.
- Finally, finetune the economic model, and the range on offer (leasing, bike for 10 years, flexible accessories, etc.)

Sources of inspiration

These are numerous and varied. The green transport sector in general, and “pedal power” in particular, have evolved in recent years.

On circular supply chains

- Velosophy : a bike made from recycled Nespresso capsules: <https://velosophy.cc/product/recycle/>
- A simpler, more direct example (as for the paints in project sheet 1), is Rediscover (Ireland), a social enterprise that revamps used bikes, with a stock of spare parts: <http://www.rediscoverycentre.ie/rediscover-cycling/>

Urban usage

There are several existing initiatives involving four wheeled “bikes” that protect riders from the elements, many of which come from the Nordic countries. They are not all equal in environmental terms.

- English firm Drycycle: <https://www.drycycle.co.uk/>
- Podride, one of the earliest vehicles of this type (<https://www.automobile-propre.com/ingenieur-suedois-invente-voiturette-assistance-electrique/>), official website: <https://mypodride.com/>
- Avial Bikes: <https://avialbikes.com/news/cityq-cargo-and-passenger-e-bike-with-4-wheel/>

- Bio-hybrid by Schaeffer: <https://www.biohybrid.com/en/> (explanatory article: <https://www.ebike-generation.com/actus/schaeffler-bio-hybrid-velo-electrique-quatre-roues-acheve-premiers-essais/>)
- The Podbike looks very futuristic: <https://www.podbike.com/en/>

In the “functional economy”

- (Almost) everyone in Brussels is familiar with Villo, the self-service bike sharing scheme (a docked model, whose bikes are always parked neatly): <https://www.villo.be/>
- Less well-known, Dutch company Swapfiets offers Brussels residents their own bike for €15 per month with ‘all-in’ service: <https://swapfiets.be/fr/>. This is highly popular with students and young people in the Netherlands.
- The “A bike for 10 years” project from Ateliers de la rue Voot: <https://voot.be/projet/un-velo-pour-10-ans/>

Customisable design

- Monkeycycle, the balance bike that becomes a pedal bike: <https://www.monkeycycle.com/>
- Belgian Ahooga bikes offer a wide range of options: <https://ahooga.bike/modular-bike/>
- Bike 43 is also designed for city use, taking up the smallest possible parking space: <https://www.bike43.com/>
- Urban Arrow have also extended their range with stunning collaborations, converting their Cargo XL model into a tridem, or 3-person tandem, popular on the hire market: <https://www.urbanarrow.com/>

Business potential

Market

A survey of the Belgian bike industry, carried out by Agoria and published in October 2019 shows that: “In 2018, total bike sales in Belgium fell slightly compared to the previous year, with 485 400 units sold. Meanwhile, production has risen again in relation to the previous year (while bike imports have slowed noticeably). The electric bike segment is growing year on year, with around 250 000 units sold in 2018, which represents a 14.6% increase on 2017 (source: Velofollies).

Other key trends in the Belgian cycle industry include a focus on quality, high-end products, as a means of standing out from cheaper imports; personalisation of locally-assembled bikes, reducing turnaround times on smaller volumes; specialisation in specific segments of the cycle market; a clear increase in electric bikes, targeting a younger audience than in the past; the growth of the B2B market, with professional cycle fleets and leasing models. The last of these trends gives rise to new business models based on repeat custom, presenting opportunities for local distributors. ”

The market remains highly active, and this has been further reinforced by the coronavirus lockdown (some companies report a 20% increase in sales). It is harder to estimate precise demand in a city like Brussels, but the trend is clear: cycling, and urban cycling in particular, is in the ascendancy. Especially if it combines convenience (including electric assistance), design, and a competitive price.

Competition

Though they differ greatly in style, Belgian brands such as Cowboy and Ahooga have successfully anticipated these trends and intend to cement their position in the market. Competition is stiff, with low-cost models sold in supermarkets and high-end models imported from England, the Netherlands and Germany.

You will need to conduct thorough market research, find a unique selling point and target your product appropriately.

It is worth noting that the ‘unconventional’ bikes mentioned above have long waiting lists, suggesting that the manufacturing process is probably subcontracted. Consider the advantages of 100% Brussels-based production to be closer to the demand and respond proactively.

Circular nature of the business

Even if it is not directly circular, strengthening the range of bicycles available as an alternative to driving is certainly sustainable.

However, this project would stand out for the versatile and long-lasting design of its bikes. This concept could be explored further by using salvaged materials (metals) in the construction of the bikes: other than the famous use of drinks cans to make an aluminium frame (an example of downcycling), there have been no initiatives of this sort. However, it may prove too complicated and labour-intensive. This will require analysis.

Finally, offering a functional solution such as “bike for 10 years”, which could be extended to “a bike for all needs”, would firmly ground the project in a sustainable, circular ethos.

The concept also represents a step back from the trend for super high-tech smart bikes (e.g. Cowboy or Angell Bike “the smart bike designed by people who don’t cycle”, as one critic called it), which belong to a decidedly different market sector.

Key figures

It is almost impossible to find exact figures on the cost of bicycle manufacture, i.e. a breakdown of the retail price according to the various stakeholders in the supply and sales chain.

An analysis of the BNB accounts of Ahooga and Cowboy reveals 2 starkly different scenarios. On one hand, we have a modestly sized company that turns a profit every year, while on the other, we have a business that cannot generate positive cash flow and recapitalises to cover its losses year after year.

Lécho states that Ahooga produced and sold 1000 cycles in 2017, with a turnover of 1.6 million euros. Their gross operating margin is €272/bike. Wage costs are €52/bike and the EBITDA is €77. The business made an initial capital investment of just €40,000 and has few debts, with 2 employees, FTE and extensive use of subcontracting.

Ahooga proves that it is possible to become a bicycle manufacturer and retailer on a shoestring, even while creating your product! They are a genuine source of inspiration!

Initially, if the company aims to produce 2000 cycles per year after four years of growth and these bikes are sold for 2000 to 7000 euros each (depending whether it is a conventional bike or a bike replacing a car), with an average price of 4500 euros, the turnover of €9 M could generate a gross margin of €1.5 M (based on the figures for Ahooga), while paying the wages of a support team of 7, FTE. However, most staffing costs are probably accounted for in the difference between turnover and margin (purchasing, assembly, sales). If we assume that 30% of turnover, or €3M, covers wages, this would be equivalent to 55 full time employees.

Potential for job creation

Around sixty employees, FTE, to produce 2000 bikes per year.

Recycling potential in tonnes

If producing 2000 bikes per year, it should be possible to recycle 30% of the mass of the bike, or $30\% \times 40 \text{ kg} = 12 \text{ kg} \times 2000 = 24 \text{ tonnes}$ of metal.

Made in Brussels

Local procurement

Bikes are primarily made of metal, worked in a specific manner. As well as making the project “circular” (see above), the possibility of using recycled metal would present an opportunity to find a supplier of pre-cut, or possibly even machined, parts locally, preferably made from quality salvaged metal.

Local partners

Partners

As an additional or complementary service, other aspects of cycling provision could be improved, including secure storage. Secure cycle parking in the city could be provided in partnership with manufacturers/fitters such as Cycloparking (other companies are currently considering this issue). Finally, you will need to find a partner to manufacture ultra-secure locks; with the rise of electric bikes, security is becoming a real issue, due to their high price.

Suppliers

As well as the basic metal frame, which will be designed to accommodate the modular accessories, you will need to find suppliers for all other components: wheels, brakes, gears, etc., unless you intend to distribute an existing innovative brand.

To save development time, we recommend working with existing suppliers and choosing ‘basic’ but high-quality components.

Distributors

It will be necessary to go through the existing distribution channels, which are already well-organised and highly-competitive, perhaps even overcrowded. Obviously, every manufacturer seeks to draw attention to the outlets that stock their product.

B2C online sale also appears essential, and the initial launch could even be crowdfunded, with pre-purchases, priority waiting lists, early testers, etc.

This would involve rapidly launching a major marketing campaign, to expand your community of followers.

Subcontractors

Difficult to predict at this stage, but generally bike manufactures prefer to assemble the finished product in-house.

Competitors

They are numerous... and varied. You need a unique selling point to stand out.

Location

You will obviously require an assembly facility, as well as large storage areas for parts and finished bikes. At least 1000 to 2000 m² initially.

Key factors for success

Operational and commercial barriers

As we have already mentioned (see above), models of the sort launched by Schaeffer can require 4 years' R&D. Rather than starting from scratch, it may be wise to seek a partner. But be mindful of the spirit and key details of this partnership, and make sure there is space for you to add value: being just one distributor among many offers limited prospects. On the other hand, being the partner that offers a local leasing service such as "a bike for 10 years", could make perfect sense.

Development times for 3-wheeled or 4-wheeled bikes are lengthy. The ability to use an existing base and, potentially, existing motor systems, would help reduce project development costs.

The question of overall weight is also worth considering; for instance, there is a huge difference between podbike and drycycle.

Intellectual property

Within more high-tech models, innovative mechanisms (in particular those used to convert or fold the bike) may be patent protected. After all, protections of this sort are fairly useless, and unenforceable, on components that are clearly visible.

Legislative obstacles

No particular obstacles for bicycles, but there is strict European legislation on vehicles, particularly if they have electric power. There is also a precise set of specifications for quadricycles (four-wheelers).

Other risks

None.

Skills of the project team

The project requires technical and sales specialists with experience of the cycle industry. Whether you intend to manufacture in-house or work with a partner as a distributor, someone in the team must fully understand the technical challenges of assembly and/or maintainable, in order to anticipate problems and accurately estimate how long various tasks will take. The salesperson also requires an understanding of the industry in order to predict its development and, most importantly, position the company appropriately. Both should contribute to discussions with suppliers and partners. The usual management, financial, and production specialists will only be required at a later date.

What the RBC (Brussels-Capital Region) can do make it a success

- If the final project involves a leasing service, the local government would have to terminate its "Villo" contract with JC Decaux (which is not truly circular, as the business model is mainly based on advertising panels installed at each station), in order to back a local, environmentally-friendly initiative.
- Given the versatile nature of the bikes, regional government or district councils could also purchase several for staff use, or lease them through a subscription scheme (or other hire model). Cambio took this approach in its early days, enabling the operator to build a significant customer base before looking for B2C customers.

References and links

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