Kickstarting Circular Business Experimentation

From product ownership to customer experience



Authors

Innoboost Cheyenne Schuit, Christiaan Kraaijenhagen

TUDelft Nancy Bocken

Co-developers

Sandra Horlings, Robbert Cornelissen, Edward Hissink, Wouter Verduyn, Nicole Brouwer, Claire Hornn.

Special thanks to

Fresh-R Jerom van Beuzekom, Joost van Andel Mud Jeans Danique Gunning, Bert van Son

Vereijken Hooijer Bart Hooijer, Ben Voetdijk

Boska Martijn Bos, Karin Groot, Chantal Schaap Bugaboo Aernout Dijkstra, Quinten van Leeuwen Anna Noyons, Sjors Boelaars, Selman Aqiqi Peerby

Simone van Tongeren **Evides** Havensteder John van der Knaap Philips Marinus van Diggelen

Acknowledgements

Hidde-Jan Lemstra Steve Kennedy

Please cite as

Schuit, C.S.C, Kraaijenhagen, C., Bocken, N.M.P. 2017. Kickstarting circular business experimentation - From product ownership to customer experience. Innoboost & TU Delft.

For more information please contact

Christiaan Kraaijenhagen, +31 6 10 88 60 85 kraaijenhagen@innoboost.nl













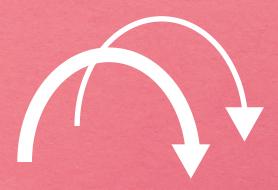






Circular Business

A business that is contributing to the transition to a Circular Economy by pursuing strategies to slow, close as well as narrow resource loops. Slowing and closing (on top of 'narrowing' strategies) distinguishes circular businesses from 'linear' ones. (Bocken et al., 2016 building on Stahel and Braungart)



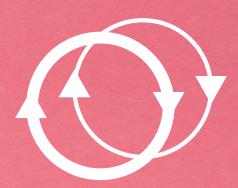
Linear flow

We take resources, make products and dispose products when they become obsolete



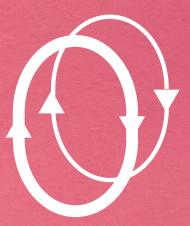
Narrowing loops

Strategies to use few resources to manufacture products and developing energy-efficient products.



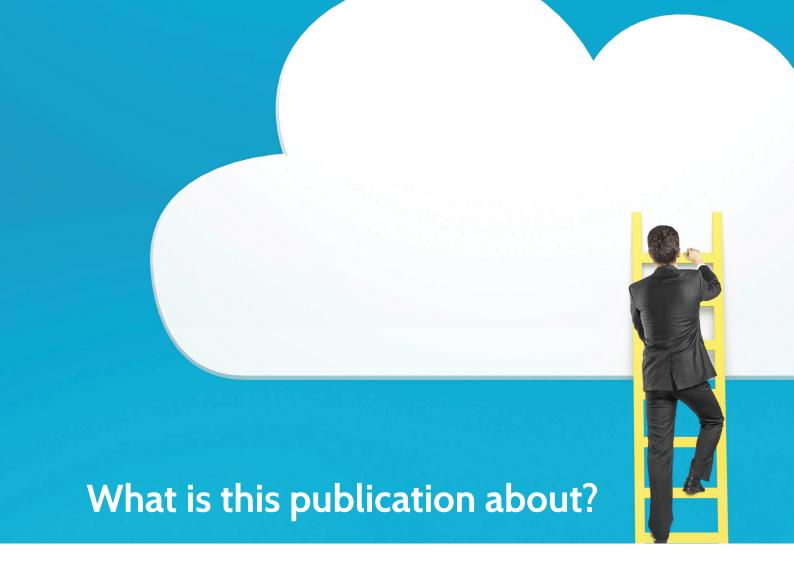
Closing loops

Strategies related to recycling in order to 'close the material loop' after multiple reuses.



Slowing loops

Refers to strategies such as maintenance, repair, refurbishing and remanufacturing to encourage product reuse



Can we speed up the transition towards circular business by focusing on the value that is created for customers? Together with eight companies, Innoboost and TU Delft explored how small scale experiments speed up the shift from selling products, to delivering services – and ultimately customer experiences.

The better we are able to retain products at the highest value over time, the longer we can benefit from those products and make the best use of the value of materials. We can do this through product redesign (e.g. design for long product life and disassembly) and through maintenance, repair, remanufacturing and reuse strategies. Shifting from products to services to enable these activities is often mentioned as a key strategy in the Circular Economy (Tukker and Tischner, 2006; Tukker, 2015; EMF, 2013), but is often perceived as radical.

Business experimentation is key to break this radical shift up into smaller steps. Experiments rather than large scale pilots can help companies test out new propositions at relatively low cost and effort (Osterwalder et al., 2014; Ries, 2011). In a business setting, experiments focus on testing 'hypotheses' about the potential future business: e.g. what type of customers are interested? How does the proposition need to be formulated? Will customers value the new services?

Based on eight case-studies and building on the book 'Circular Business - Collaborate and Circulate' (Kraaijenhagen, C., Van Oppen, C., Bocken. N., 2016), this publication explains steps companies can take towards a Circular Economy by focussing on value for customers and business experimentation.

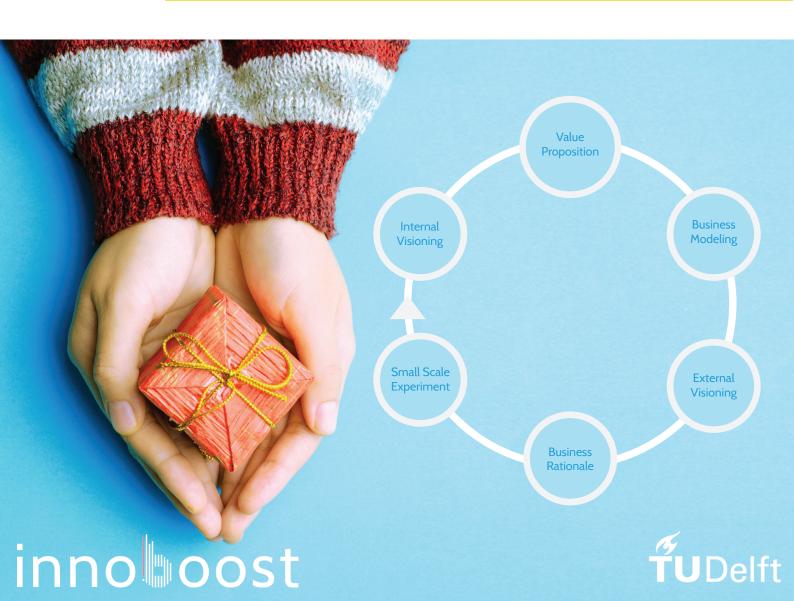
Download tools on our website. Once you filled in your emailadress, all tools will be send to you via email. For research purposes at TUDelft we like to stay in touch to ask you how you used the tools. Share your results by using **#circularexperiment.**

A guide to chapters that are relevant to you

The eight case companies are drawn from different industries, varying from start-up to long-established businesses, and ranged in their degree of familiarity with implementing the circular economy. Well-aware that each company finds itself in a different stage, we invite you to read the chapters that are relevant to you.

The chapters in this publication are divided into specific questions that companies can deal with in the transition to a Circular Economy. While reading a short introduction of the eight case companies on the next page, ask yourself: "Which company do I consider most relevant for my business?"

Click on the links in the introductions to be directed to the chapter on the corresponding step.



Boska: Positive impact starts with creating an internal vision

Boska Holland wants to help people enjoy cheese by delivering cheese accessories such as slicers, fondue sets, graters, curlers and boards. This 120 year-old family company took the first steps to develop 'circular ideas' based on customer insights that were collected in a Facebook panel. The radicalness of these ideas, triggered various internal discussions at Boska, for instance: What can we do now to create a positive impact for the environment? What is our role as a business in delivering positive impact? It showed that creating and sharing an internal vision is essential before circular ideas can be developed and tested.

Read more: I want to create a positive impact, but where should my company start?







Fresh-R & Peerby: Creating value propositions that resonate with customer needs

Fresh-R is a start-up that has developed a modular decentralised ventilation system. They wondered how they could sell fresh-air in a performance model, instead of the system itself. By reflecting on why different target groups would be interested in buying 'fresh air' per cubic meter, new business opportunities were found.

Peerby is a company that stimulates the sharing economy through a product exchange platform for neighbours. In this project, Peerby explored how they could generate additional revenue streams. Taking Peerby's unique resources and capabilities as a starting point, it quickly became evident that their intangible assets can be turned into additional revenue streams for other target groups.

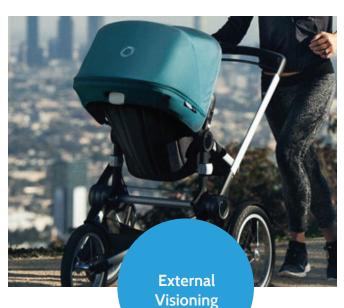
The 'Value Proposition' chapter tells you more about how Fresh-R and Peerby found other target groups for their circular idea than the target group they were initially focussing on.

Read more: How do I create circular propositions that resonate with customer needs?

Vereijken Hooijer: Creating new business models

Vereijken Hooijer is a company that produces stables. It analysed how they could help farmers to invest in sustainability and wellbeing of pigs. Through a focus group with farmers and a packaged meat retailer, they discovered that the whole supply chain needs to change and that each revenue structure has different implications for farmers. Business experimentation is not only necessary to test propositions, but also to take away assumptions regarding other building blocks of the business model such as the revenue structure.

Read more: How can I create a business model for positive impact?







Bugaboo & Evides: Working with other stakeholders to create an external vision

Mobility concept creator Bugaboo experiments with leasing strollers through its 'Flex-plan'. Bugaboo has worked alongside retailers to explore how longer lasting products could lead to a win-win-win situation for Bugaboo, its customers and its retailers.

Evides, a water supply company, joined forces with the social housing cooperation Havensteder and the municipality of Rotterdam to make neighborhoods more water-aware and -resilient. In both cases concrete solutions were proposed to improve ideas from a multi stakeholder perspective by identifying what value is created, missed and destroyed.

Read more: How can we improve ideas from a stakeholder perspective?

Mud Jeans & Philips: Testing assumptions through small-scale experiments

Mud Jeans is a denim company that brings circularity into practice. It explored how they could make their lease-a-jeans concept more attractive to customers by testing two stories in an A/B test on Facebook.

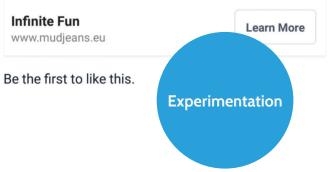
Philips experimented with circular business models by constructing experiments that were as real-life as possible. By involving consumers they are developing the circular service together.

Read more: How do I test my assumptions with experiments?

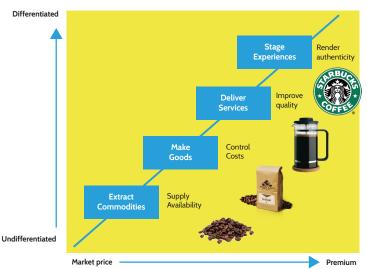


Can we make a sustainable lifestyle fun again and again?





Source: Pine & Gilmore, 1998



The vision: Customer experiences as an enabler for the Circular Economy?

As argued in this report, shifting from products to services can deliver more value for your customer and is regarded as a key strategy in the Circular Economy. The eight case studies revealed steps in shifting from selling product ownership to delivering services. Pine and Gilmore (1998) tell us that customers are willing to pay even more for experiences. Can shifting from delivering services to experiences, help to cover higher investments for circular design and thereby be an enabler for the circular economy. Are you curious and do want to explore this further with us?

Read more: How can delivering customer experiences speed up the transition to the Circular Economy?



Slowing resource loops

"The greenest product is the one that already exists, because it doesn't draw on new natural resources to produce" (eBay Inc, 2014)

- John Donahoe, CEO of eBay Inc.

The transition to a Circular Economy can be enabled by several design, value chain and business model strategies. One of these strategies is to slow resource loops by designing for product life-time extension (Stahel, 1982; Bocken et al., 2016). In contrast to recycling, activities such as maintenance, repair, refurbishing and remanufacturing can avoid the manufacture of new products and its associated resource and energy use. It thereby influences the speed of the flow of materials or goods through our economy.

Reverse logistics focuses on getting back products from end-customers to the manufacturer or other service providers. The intention could be maintenance, repair or remanufacturing. In contrast forward logistics is about getting products to the market/ end consumer.

Why you should start with the customer

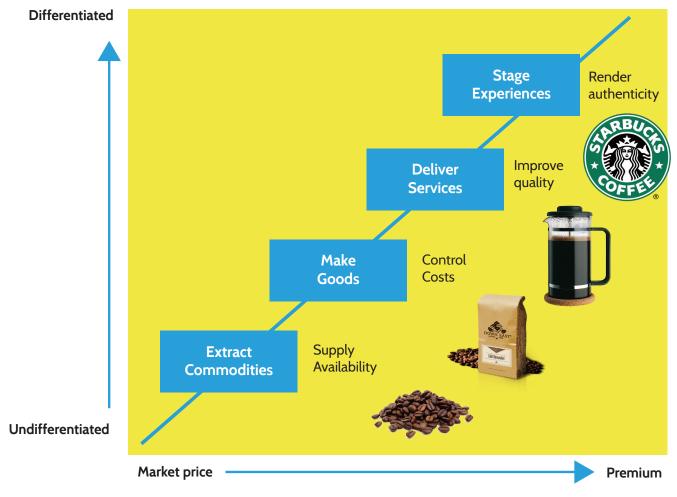
Designing products for product life-time extension can increase production costs compared to the 'take-make-dispose' economy as more reliable and higher quality components need to be selected (Qi and Sawhill, 2014). Moreover, refurbishment, remanufacturing and service models in which reuse and maintenance strategies are used, require reverse logistics for which companies can perceive unclear potential financial benefits (Starostka-Patyk, 2013) or experience a lack of initial capital for investments (Bouzon and Govindan, 2015; Subramanian et al., 2014; Lau and Wang, 2009). This makes it essential to prove to companies that there is a source of business for such models. If investments for circular design are higher, companies must find ways to add value that customers are willing to pay for. Therefore, these eight case studies started with the customer, instead of the supply chain or disassembly of a product.

From product ownership to customer experiences

"Why would I actually sell you the product, if you are primarily interested in the benefit of the product? Maybe I can stay the owner of the product and just sell you the benefit of the service?"

- Frans van Houten, CEO of Philips 19 February 2016

Source: Pine & Gilmore, 1998



The 'take-make-dispose' economy relies on a business model of continuous product replacement. Products need to become obsolete, before companies can sell a new one. Slowing resource loops requires a different way of doing business, such as access and performance business models that provide capabilities or services to satisfy user needs without needing to own products (Bakker et al., 2014; Bocken et al., 2016). Instead of receiving product ownership, customers access a service. This way of thinking requires us to think about the benefits that customers are searching for. Companies that offer sustainable products sometimes tend to forget this: a product that is made of recycled materials does not necessarily help customers to reach their goal in a better way.

Fig 1. Consumers pay more for experiences

Already in 1998, Pine and Gilmore argued that customers are willing to pay more for services and experiences than goods. To give an example, for 25 cents we can make our own cup of coffee at home with instant coffee and hot water. If we visit a cafe, a cup of coffee costs 2 euro. For a cup coffee at Starbucks, where they write down your name on the cup and create an experience with comfortable seats and a relaxing atmosphere, you pay at least 4 euros.

If customers are willing to pay more for the value they get, companies can get a return on their higher investments for circular initiatives. Consider for instance the logistics to retrieve products for maintenance, repair or remanufacturing, or the changes required to product design to make it modular and easily to dis- and reassemble, avoiding glue constructions or choosing higher quality and longer lasting parts. These activities can make investments for circular initiatives higher compared to linear models. Can we add an experience to circular initiatives to cover higher investments?







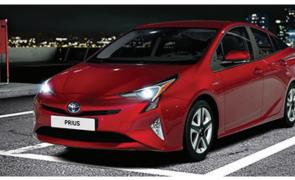


Fig 2. Creating experiences combined with a positive business impact

Postive Business Impact

To give an example, consumers can own a car, but may be more interested in convenience and flexibility. Companies like Zipcar (bought by Avis in 2015) and Drive Now (part of the BMW Group) have already been offering car sharing for a while, but now this has evolved to using apps to share electric cars, like Vukee car and Tesla, to offer an even easier and stylish experience. Shifting towards circular business models starts with the value proposition: What do customers want to accomplish, can we turn this into an experience and how can we bring this to them in a more resource efficient way?

The following chapter explains more about the identified steps companies can take towards a Circular Economy by focussing on value for customers and business experimentation.

Visit our website to download tools and share your results by using #circularexperiment.





Case: Boska

Starting as a blacksmith in Bodegraven in 1896, Boska Holland has become the largest producer of accessories for cheese, such as slicers, fondues, graters, curlers and boards, also called cheesewares. Martijn Bos is now leading this 120-year old family business into the fourth generation but often wonders: What "heritage" do I pass onto future generations? And what can we do to create a positive impact?

During our project with Boska, we noticed that employees can have different visions on what their company can do to create a positive impact. With all these visions, it is easy to get lost in discussions. Many things can be done to start to make a positive impact, varying from installing solar panels, to choosing recyclable materials, to reusing components, but what is the ambitious goal in the long term and what steps can be taken now?

An inspiring example: Interface A roadmap can help us to work towards a goal, while taking one step at a time. In 1994, Ray Anderson stated that Interface wanted to eliminate all their negative impact by 2020. Twenty-two years later they reduced CO2 emissions by 90% on European production sites. In this inspiring TED talk, Ray Anderson explains what drives him. He explains: 'Theft of our children's future will someday be a crime'. Want to find your drive? Use the 5P tool for some triggering questions. (Kraaijenhagen et al., 2016).

The 'Risk to Opportunity Map' helped Boska to structure the discussion and to get a collective understanding of where the company stands for and where it wants to be in the future. Plotting concrete ideas of all project members on this map, helps to visualize on which timeframe ideas or steps can be taken and how the company could work towards the ultimate goal: a system change in which the significant positive social and ecological impact is measured and proven. From fulfilling legislative and compliance requirements to more radical steps, such as changing the business model: the plotted ideas can be used to make a roadmap as your project progresses.



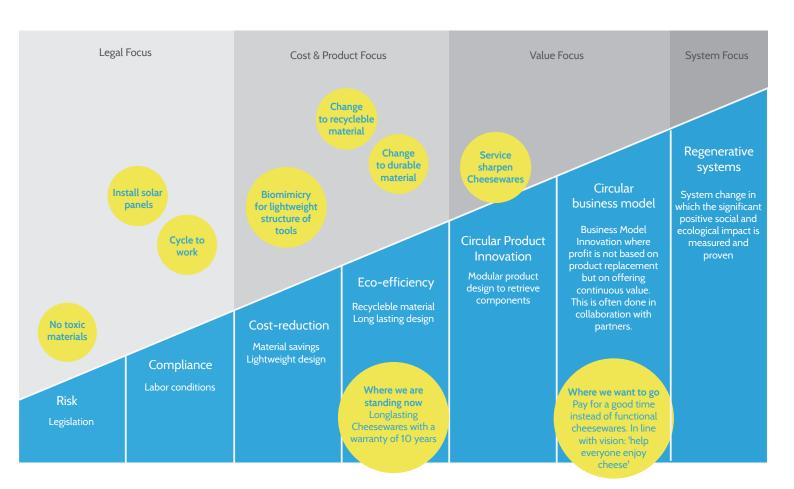


Fig 3. Risk to Opportunity Map

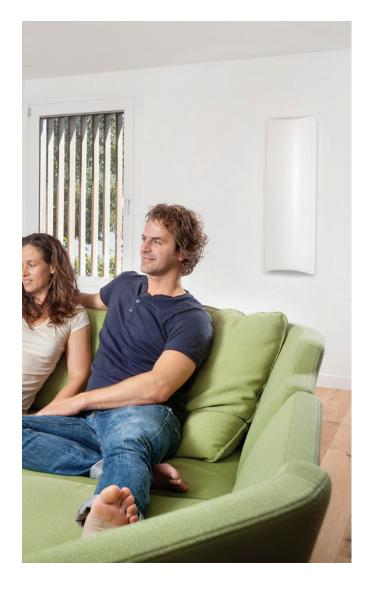


There are different ways to create value propositions that resonate with customer needs. You can use your existing target customer group to develop new services and products, or start with your circular product and unique resources and capabilities to find target groups that are interested in these.

Case: Fresh-R - Building propositions based on your existing product

The Fresh-R is a demand-driven decentralised ventilation system with heat recovery. It creates a healthy indoor climate for energy efficient houses and allows customers to save up to more than 25% on their electricity bill. Being a modular product, it is perfectly suitable for the Circular Economy. But how do we make it resonate with customer needs?

There can be several reasons why customers would want to use products or services. In the case of Fresh-R, fresh air can help you concentrate, create a healthy environment or help you to relax. What if instead of paying for owning the system, employers would pay to keep CO2 below a certain level to help their employees concentrate better and feel good? As the Fresh-R is a demand driven system that reacts on measured CO2, it adapts to flexible working hours and an irregular presence of employees at the office.

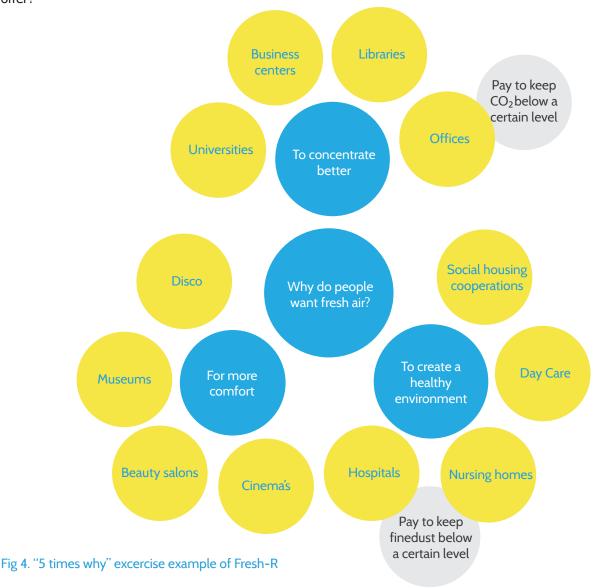


By asking "Why" 5 times (a framework developed by Sakichi Toyoda), we can discover the true needs of customers. By discovering those needs and connecting them to different target groups, we can create circular business models, such as those based on product or service 'access' rather than product 'ownership'. In the case of Fresh-R the "value currency" changed from "paying for the system", to "paying to keep CO, below a certain level to maximize concentration". A currency that is not only interesting for offices, but for universities and libraries as well. The same can be done for housings. Instead of paying for the ventilation system, customers can pay for a healthy comfortable environment made visible by a CO₂ measurement system. Fresh-R calls this Smart Indoor Air Care. What is the core reason why customers use your product or service? Can this insight change the value currency for your offer?

Case: Peerby - Building propositions based on your unique resources and capabilities

Peerby allows you to borrow items from your neighbours. By connecting people with each other and encouraging collaborative consumption, where not everyone has to own a product, Peerby aims to establish an alternative for our consumption-driven throw away culture. How can Peerby generate additional revenue streams?

Instead of using the Peerby platform as a starting point, we started looking at all resources and capabilities of the company.





Case: Boska - Building propositions based on your customer needs

Experimentation can also be used to collect customer insights for new products and services. For Boska, a Facebook panel with thirty cheeselovers was set up to explore what 'enjoying cheese' means to them. 'What do you pay attention to, when do you want to enjoy cheese?' 'What does your 'ultimate cheese-moment' look like?' The comment section allows facilitators to keep asking specific participants questions based on their answers. Participants were also asked to share pictures of their ultimate cheesemoment, which gives a feeling of what enjoying cheese means to them. Based on these insights, new circular services and experiences can be developed.

Most of them were intangible, like having the knowledge and experience to start a community, real-life data on when products break down or their ability to steer community members to certain locations. For each of these assets, we asked ourselves: who would be interested in this?

Real-estate agents might be interested in how often neighbors borrow something from each other, because it expresses 'trust' in their neighborhood. Postal services might be interested in community members that can take packages with them if they are going in a certain direction anyway. Governments might be interested in Peerby's knowledge on how to stimulate sharing.

To select the most promising directions we judged ideas upon three criteria:

- How well does it fit's Peerby's mission to move away from the throw-away culture?
- What is the estimated business potential?
- Is it scalable?

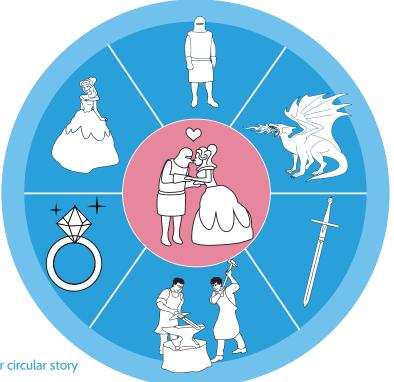
None of the selected directions was targeted at paying community members. The ideas were derivatives of their core business 'borrowing or renting items from your neighbors'. What we learned is that although the goal of the Circular Economy is first and foremost about closing, narrowing or slowing resource flows, intangible resources, such as data, knowledge, as well as experiences, should not be forgotten as they can add more value to your offering. Rethinking the system goes beyond materials.



Fig 5. Example of question in closed facebook community

Composing your circular story

Once you have collected insights by researching your target group or deriving from your companies' resources and capabilities, you are ready to use the CeX-template developed by Innoboost to compose your Circular Story. You can download tools from our website. If your customer is the knight, the true hero of your story, how would the fairy tale qo?



Download CeX template on our website

Fig 6. CeX template helps you to compose your circular story



Inspiring example: HOMIE

HOMIE helps customers to significantly reduce their environmental impact in the home by moving from "ownership" to "Pay-Per-Use" through a service-driven business model. Their service offers free installation and maintenance of a high-quality washing machine, with the cost of water and electricity included in a small fee charged per washing cycle. Only after having tested the viability of the business model with "friends and family" by installing the connected washing machines in their homes, the company started to advertise through Marktplaats (Dutch equivalent of eBay) to test the viability of this model. Only after receiving positive test-results that proved there was a clear demand, the company continued to develop this circular business model.

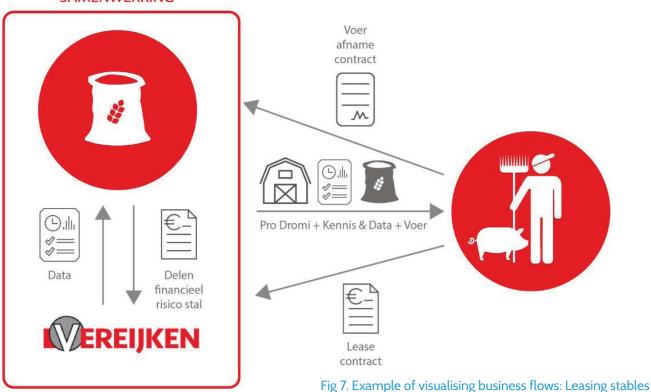


Case: Vereijken Hooijer

Vereijken Hooijer believes that healthy, happy piglets are the best indicator for a successful pig farming business. A focus-group with farmers and meat-retailers showed that it is important to test other building blocks of the business model canvas (Osterwalder & Pigneur, 2010) as well. The revenue structure appeared to be an important building block.

One of the ideas was that farmers lease stables and agree to purchase feed from a certain company during the leasing contract. This feed company could help Vereijken Hooijer to pre-finance the stables in exchange for having guaranteed customer referrals.

SAMENWERKING



However, farmers felt this would limit their freedom as entrepreneurs. They find it important to change the feed of their pigs once in a while. It proved how important experimentation is to develop business models. By proposing concrete solutions we can get a better understanding of what stakeholders like and dislike or what opportunities and risks they see.

Another thing we learned is that it helps to envision flows between stakeholders by using the <u>methodology of 'Board of Innovation'</u>. It reveals if there is a balance in value exchange between stakeholders, which is essential as each stakeholder must feel like there is enough to gain in this new system.

The case with Vereijken Hooijer showed that it is essential to adress the entire system from 'pig farmers' to 'consumers in the supermarket'.









Even companies that do not sell

Inspiring example: Ecosia

physical products can fight against the depletion of resources through their business model. Search engine Ecosia for example donates 80% of their search ad revenues to plant trees. Even if users do not click on ads, users can help Ecosia to generate more revenue just by searching. The more people search on Ecosia, the bigger the exposure for advertisers, which makes Ecosia an attractive communication-channel. With a tree counter that shows how much trees you have planted by using Ecosia, they create a customer experience that turns searching into a little game.



REEDS GEPLANTE BOMEN MET ECOSIA



Case: Evides

Evides Waterbedrijf delivers safe, clean and tasty drinking water to 2.5 million customers on a daily basis and operates with close regard to its local environment. Evides got in touch with social housing cooperation "Havensteder", who wanted to create a pleasant living environment for their residents and address the water-issues in the area of Rotterdam Lombardijen. With the forecast of increasing intensity of rainfall, Evides joined forces with social housing cooperation Havensteder, the city of Rotterdam and architects of Gebouwd Water to tackle a shared challenge to make neighborhoods more water-resilient for the future.

In a Circular Economy, new collaborations and systems are formed. Instead of sticking to what you do in the same way, can you use your existing capabilities in other ways or develop new ones to stay relevant? Are there any forms of overcapacity (e.g. sales and logistics channels, data, space), where a value missed can be turned into a value opportunity?



Sustainable technology and innovative business models force certain companies to think about their role in the future and to re-evaluate how they use their assets. To give an example, companies such as Airbnb, Uber and Marktplaats (an online market space for used products) are forcing tax authorities to rethink their tax-system. For Evides it is important to rethink their role as a sustainable and innovative water supplier.

What if people start to provide their own water, through decentrally provided water filters, just as people are generating power with solar panels, decentralised and off established large power grids?

To get a better understanding of each other's perspective on circular ideas, the value mapping tool (Bocken et al.,2013) can be used to assess concrete solutions and enhance them in cross-company teams.

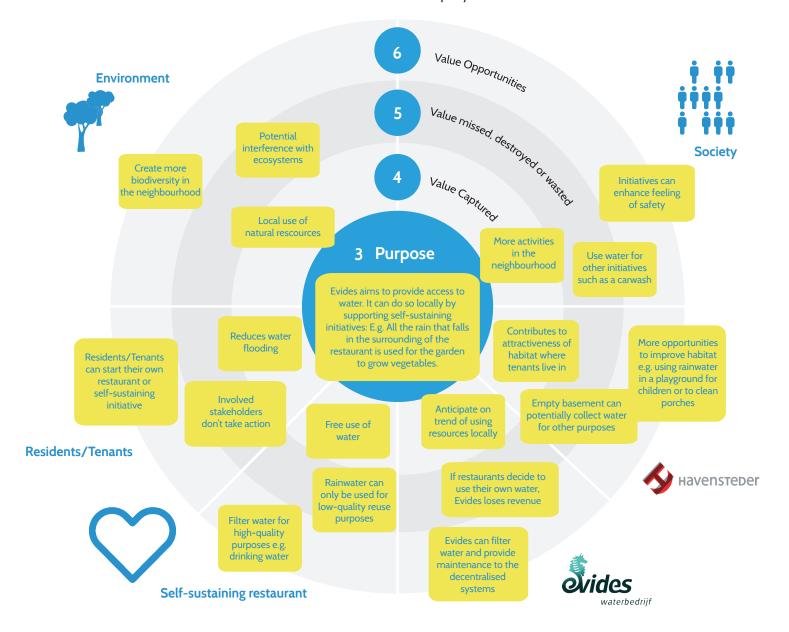


Fig 8. Example of Value mapping tool excercise for Evides

Case: Bugaboo

In the case of Bugaboo, who describe themselves as a "mobility concept creator", concrete solutions were suggested in an interview with retailers to discover how Bugaboo and retailers can innovate together to keep the value of long-lasting strollers within their supply-chain.

Retailers were surprisingly open-minded as they are already noticing that their role is changing. For example, because e-commerce customers no longer need to visit stores as they can search online, and prices have become more transparent. Instead of selling strollers, customers buy components or accessories to upgrade strollers they have bought on Marktplaats. Retailers were open to explore opportunities together, as long as the business rationale made sense for all parties involved.

In short, rather than hanging onto your existing business model, be open-minded about new potential roles you could explore and adopt, and open the discussion with your stakeholders. Maybe they see an urge to change as well?



U Volg je Hart Gebruik je Hoofd Triodos & Bank

Inspiring example: Buy the Change

organisations that support a healthy and sustainable environment.

Recently they started the initiative 'Buy the change', a platform that gives sustainable entrepreneurs more exposure to consumers and helps consumers to consumer sustainably by labeling products with a 'buy the change' logo. On their website, Triodos actively searches for collaborations to shape the change, e.g. by searching for partners who can build an app or start a community. Starting with a concrete idea as a test in Amsterdam, they now invite others to empower them and expand the concept.



Case: Mud Jeans

In 2013, Mud Jeans introduced the innovative jeans concept of 'Lease-a-jeans'. For a fixed fee per month, users lease the jeans. When they are finished wearing them, they are shipped back to Mud Jeans and recycled into new clothing. With this concept Mud Jeans is moving away from the lineair take-make-waste economy in which we throw away many valuable resources. We aim to reuse all of our fabrics again, closing our own loop.

Mud Jeans assumed that leasing jeans foremost offers guilt-free consumption. But what does this really mean? And what is the unique benefit for customers? They decided to take another look at their value proposition.

After a brainstorm session on different propositions, two stories for leasing a pair of jeans were tested on Facebook through ad campaigns. Images were kept similar so that the comparison was only based on text. The ad with the most clicks gave direction for a new proposition.

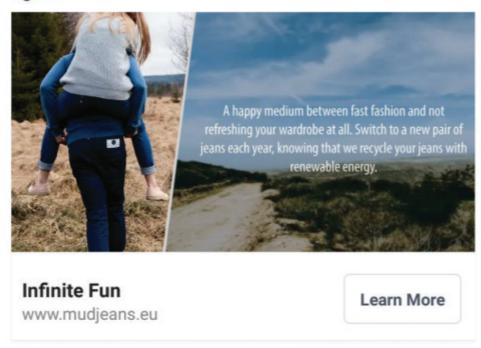
Case: Philips

Philips experimented how customers react on a circular service model by constructing several tests that are as real-life as possible. Sellers of a Philips product on Marktplaats (Dutch online second hand market) were interviewed on why they decided to sell it. Customers who heard about the product, but did not use it yet, were asked what is holding them back.

To generate more insights, Philips designed several ads for Facebook, to test who click on the advertisement of the circular idea. This gives them demographic data which can be useful for the business case. When customers clicked on the ads, they were referred to a website where people could subscribe to participate in an experiment to develop the circular service model together. Selected participants join a pilot and receive the actually product to get a better understanding of their customer experience in a closed community.



Can we make a sustainable lifestyle fun again and again?





We have to become more sustainable, can we help each other?

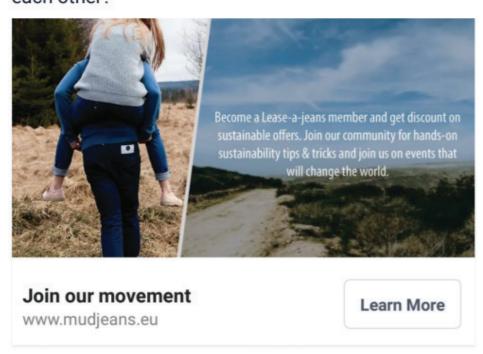


Fig 9. Example of advertisements to test stories for leasing Jeans



Call for action

"In today's service economy, many companies simply wrap experiences around their traditional offerings to sell them better. To realize the full benefit of staging experiences, however, businesses must deliberately design engaging experiences that command a fee"

- Pine and Gilmore, 1998

So far, these cases explored how we can shift from product to services or how we can enforce services. But how do we turn this into a 'circular experience'? We are looking for companies to get this to the next level. Let us know what you think about the tools on our website and share how you used it, so we can improve it. Are you ready to experiment?

Contact

Christiaan Kraaijenhagen, +31 6 10 88 60 85 kraaijenhagen@innoboost.nl



Thank you for Experimenting with us!

Fresh-R, Mud Jeans, Vereijken Hooijer, Boska, Peerby, Bugaboo, Evides and Philips: thank you for daring to experiment with us in the journey to a Circular Economy! Experimentation by design moves along one step at a time, but moves us closer towards our shared goal of the Circular Economy.

Good luck on your journey!



Bakker, C., Den Hollander, M., van Hinte, E., Zijlstra, Y. (2014). Product that Last. Product Design for Circular Business Models. TU Delft Library, Delft, The Netherlands.

Bocken, N.M.P., de Pauw, I., van der Grinten, B., Bakker, C. 2016. Product design and business model strategies for a circular economy. Journal of Industrial and Production Engineering, 32 (1), 67-81

Bocken, N., Short, S., Rana, P., Evans, S. 2013. A value mapping tool for sustainable business modelling. Corporate Governance, 13 (5), 482 – 497

Bocken, N.M.P., Weissbrod, I., Tennant, M., 2016. Business model experimentation for sustainability. Sustainable Design & Manufacturing Conference, Crete, Greece, 4-6 April 2016.

Bouzon, M. and Govindan, K. (2015). Reverse logistics as sustainable supply chain practice for the fashion industry: An analysis of Drivers and the Brazilian Case. Sustainable fashion supply chain management, Springer Series in Supply Chain Management, 1, 85-104. Cham, Switserland: Springer International Publishing Switzerland.

Bouzon, M., Govindan K. and Rodriguez, C.M.T. (2015) Reverse logistics barriers: an analysis using interpretive structural modeling. Enhancing Synergies in a Collaborative Environment, Lecture Notes in Management and Industrial engineering, 96-103. Cham, Switserland:Springer International Publishing Switseland.

Kraaijenhagen, C., Van Oppen, C., Bocken. N., 2016. Circular Business Collaborate and Circulate. Circular Collaboration

Lau, K.H. and Wang,Y. (2009). Reverse logistics in the electronic industry of China: a case study. Supply Chain Management: An International Journal, 14(6), 447 – 465.

Pine, J.B. and Gilmore J.H. (1998). Welcome to the experience economy. Cambridge: Harvard Business Review

Qi, L. and Sawhill, J. (2014). How durable should durable products be made under different scenarios of technological advance?. Int. J. Production Economics. 156 (6). p. 72-82.

Ries, E. 2011. The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses. Penguin Books, London, UK

Stahel, W.R., 2010. The Performance Economy. Palgrave Macmillan, Hampshire RG21 6XS, UK

Stahel, W., 1982. The product life factor, in: Orr, G.S. (ed.), An Inquiry into the Nature of Sustainable Societies. The Role of the Private Sector. Houston Area Research Centre, Houston, 72-105.

Starostka-Patyk, M., Zawada, M., Pabian, A. and Abed, M. (2013). Barriers to reverse logistics implementation in enterprises. International Conference on advanced Logistics and Transport (ICALT).

Subramanian, N., Gunasekaran, A., Abdulrahman, M. and Liu, G. (2014). Factors for implementing end-of-life reverse logistics in the Chinese manufacturing sector. International Journal of Sustainable Development and World Ecology, 21(3). 235-245.

Tukker, 2015. Product services for a resource-efficient and circular economy e a review. Journal of Cleaner Production. 97, 76–91

Tukker, A., Tischner, U., 2006. Product-services as a research field: past, present and future. Reflections from a decade of research. J. Clean. Prod. 14 (17), 1552-1556
Osterwalder, A., Pigneur, Y., Bernada, G., Smith, A. 2014. Value Proposition Design. How to create products and services customers want. John Wiley & Sons, Hoboken

Weissbrod, I., Bocken, N. 2017. Developing sustainable business experimentation capability – a case study. Journal of Cleaner Production Volume 142, Part 4, Pages 2663–2676 http://www.sciencedirect.com/science/article/pii/S0959652616318431

innoloost



