

# Sustainable Business Model Design

Florian Lüdeke-Freund  
Henning Breuer  
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45 Patterns

We live in a time where we have reached broad agreement on 'why' to act for sustainability in business. The challenge is now to understand 'how'.

Today, understanding the 'how' comes with a sense of urgency, as customers are increasingly asking business to innovate for sustainability.

This is a decisive opportunity. Business is a formidable innovation engine. It has the knowledge, skills, and resources to turn sustainability challenges into market opportunities.

But as long as we are held back by traditional ways of thinking about business models - often rooted in industrial age ideas about mass production and consumption - it will be difficult to fully unlock innovation's potential to create sustainable value. This next step requires sustainable business model design.







In this book, sustainability and innovation experts Florian Lüdeke-Freund, Henning Breuer, and Lorenzo Massa explore sustainable business model design. What it is, why it matters, and - most importantly - how to make it work. They present 45 patterns for the design of next generation sustainable business models, illustrating how innovative companies and visionary entrepreneurs have implemented them, what sustainability challenges they have solved and what innovation opportunities they have captured.

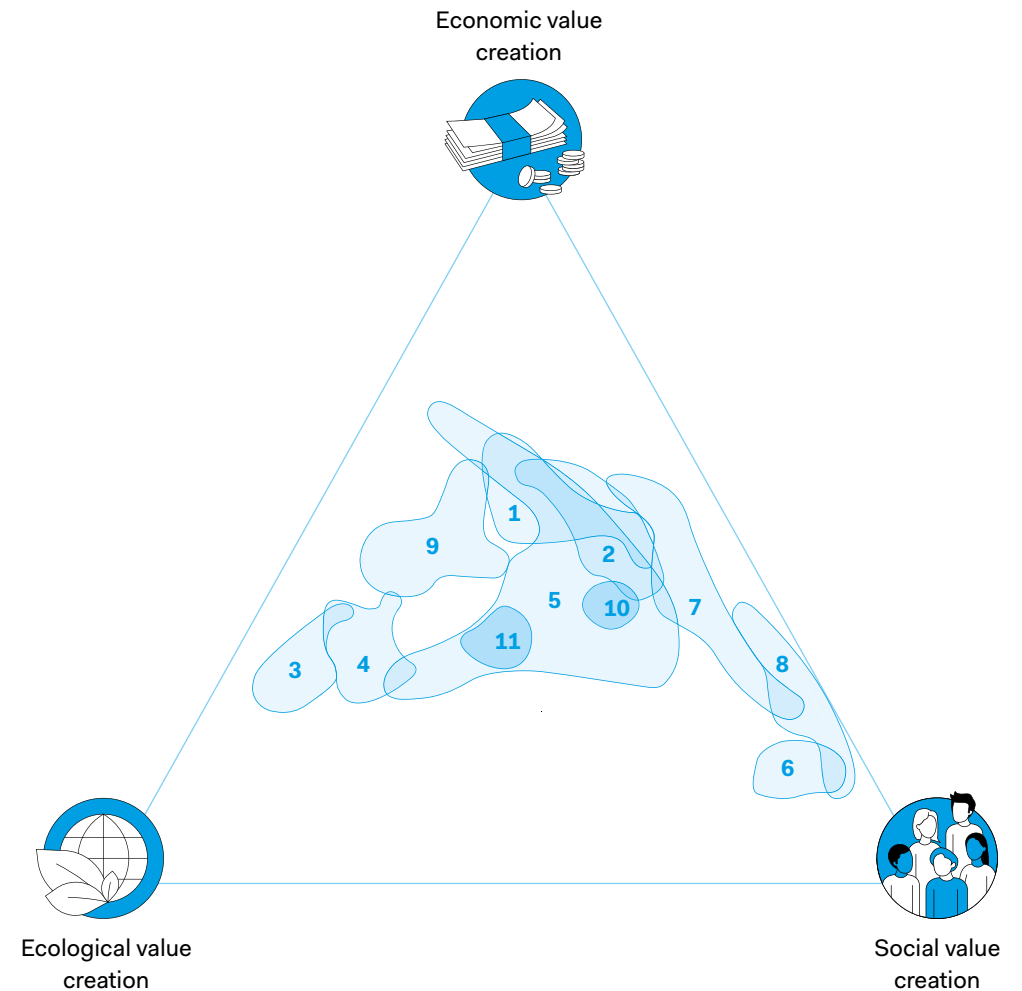
The principles and practice of sustainable business model design are woven together here as never before. This book is a long overdue guide and inspiration on how to design next generation sustainable business models.



[www.sustainablebusiness.design](http://www.sustainablebusiness.design)

# The 45 Patterns

<p><b>1</b> <b>PRICING &amp; REVENUE</b> patterns define how the offerings of sustainable business models can be priced and revenues generated.</p>		<p>1 <b>Differential Pricing</b> 62            2 <b>Social Freemium</b> 65            3 <b>Customer Financing</b> 68            4 <b>Subscription</b> 71</p>
<p><b>2</b> <b>FINANCING</b> patterns suggest different ways of acquiring equity, debt, and operating capital to finance sustainable business models.</p>		<p>5 <b>Crowdfunding</b> 76            6 <b>Microfinance</b> 79            7 <b>Profit Reinvestment</b> 82</p>
<p><b>3</b> <b>ECODESIGN</b> patterns define how activities, processes, and offerings can be designed to improve the ecological performance of business models.</p>		<p>8 <b>Green Razor and Blade</b> 88            9 <b>Resource Efficiency and Productivity</b> 92            10 <b>Sustainable Product Design</b> 96            11 <b>Renewable Resources and Natural Processes</b> 100</p>
<p><b>4</b> <b>CLOSING-THE-LOOP</b> patterns integrate the idea of circular material and energy flows into business model design.</p>		<p>12 <b>By-Product Synergy</b> 106            13 <b>Industrial Symbiosis</b> 110            14 <b>Online Waste Exchange Platform</b> 114            15 <b>Product Recycling</b> 118            16 <b>Remanufacturing</b> 123            17 <b>Repairing</b> 127            18 <b>Reusing</b> 131            19 <b>Take-Back Management</b> 135            20 <b>Upgrading</b> 139</p>
<p><b>5</b> <b>SUPPLY CHAIN</b> patterns define how resource inputs are sourced and target markets are reached.</p>		<p>21 <b>Green Supply Chain Management</b> 146            22 <b>Inclusive Sourcing</b> 150            23 <b>Micro Distribution and Retail</b> 154            24 <b>Virtual Sales and Distribution</b> 158            25 <b>Produce on Demand</b> 162            26 <b>Short Supply Chain</b> 166</p>
<p><b>6</b> <b>GIVING</b> patterns enable the donation of products or services.</p>		<p>27 <b>Buy One, Give One</b> 174            28 <b>Data for Social Good</b> 177</p>
<p><b>7</b> <b>ACCESS PROVISION</b> patterns help create markets and provide offerings for otherwise neglected social target groups.</p>		<p>29 <b>Market Maker</b> 182            30 <b>e-Transaction Platform</b> 185            31 <b>Experience-Based Customer Credit</b> 188            32 <b>Last-Mile Grid Service</b> 192            33 <b>Value-for-Money Education</b> 196            34 <b>Value-for-Money Housing</b> 200</p>
<p><b>8</b> <b>SOCIAL MISSION</b> patterns show how to empower social groups to become productive partners and to turn their needs into demand.</p>		<p>35 <b>Expertise Broker</b> 206            36 <b>Employing Minority Talent</b> 209            37 <b>Soup Kitchen</b> 212            38 <b>Socio-Economic Empowerment</b> 215            39 <b>Two-Sided Social Business</b> 219</p>
<p><b>9</b> <b>SERVICE &amp; PERFORMANCE</b> patterns support dematerialising a business model by shifting from physical products to functions, services, and results.</p>		<p>40 <b>Pay for Success</b> 224            41 <b>Product-Oriented Service</b> 228            42 <b>Use-Oriented Service</b> 232            43 <b>Result-Oriented Service</b> 236</p>
<p><b>10</b> <b>COOPERATIVE</b> patterns integrate a broad range of stakeholders as co-owners and co-managers.</p>		<p>44 <b>Cooperative Ownership</b> 242</p>
<p><b>11</b> <b>COMMUNITY PLATFORM</b> patterns substitute individual resource or product ownership with community-based access.</p>		<p>45 <b>Sharing</b> 248</p>



# Sustainable Business Model Design

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- FLORIAN, HENNING  
AND LORENZO

Sustainable Business Model Design – 45 Patterns

Authored by Florian Lüdeke-Freund (Hamburg, Germany), Henning Breuer (Berlin, Germany), and Lorenzo Massa (Zurich, Switzerland).

First edition, published by the authors, Berlin, Germany.

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Book design and illustration by Arndt Benedikt, Magic hands for magic brands.

Printed by Druck- und Verlagshaus Zarbock GmbH & Co. KG, Frankfurt am Main.

Copyediting by Paul Lauer.

Original 'Pattern Triangle' developed with support from Alexandre Joyce.

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ISBN 978-3-9824003-0-3

For Jenny, Ava Janne, and Elva Nieke  
*Florian Lüdeke-Freund*

For Inho Anton, Jun Robert, and Su Hyeon  
*Henning Breuer*

For Giovanna and Bruno  
*Lorenzo Massa*



# Sustainable Business Model Design

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Lorenzo Massa

“Language serves not only to express thoughts, but to make possible thoughts which could not exist without it.”

Bertrand Russell

Russell, B. (1948). *Human Knowledge: Its Scope and Limits*. Simon & Schuster.

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# About the Sustainable Business Model Design project

This book is the product of a long and in many ways adventurous journey, which started long before the idea of writing a book emerged. The intellectual origins of this book can be found in earlier research projects.

A project supported by the Network for Business Sustainability (NBS) South Africa invited some of us to conduct an extensive systematic review and assessment of the published literature on sustainable business models, under the title of 'Business Models for Shared Value', a popular notion at the time. Among other things, this revealed that there had already been quite a few attempts to classify sustainable business models. It also revealed that the proposed classification schemes were only partly overlapping, and so were often difficult to reconcile. As a consequence, it was difficult to really understand what were the different types of sustainable business models. We wanted to clarify that.

This offered the inspiration for a second phase of research, which we conducted with two main goals in mind. We wanted to offer a rigorous answer to the following question: What types of sustainable business models do we already have? And we had - and still have - the ambition to develop the foundations for a sustainable business model 'pattern language', similar to Christopher Alexander's seminal work on urban design, buildings, and construction. Our friend and colleague Alexandre Joyce, who together with Sarah Carroux was part of this effort (see Acknowledgments), had drawn our attention to Christopher Alexander's work on patterns, an approach that shaped our approach to classifying sustainable business models considerably.

The results of our research were published in different reports, book chapters, and journal articles, many of which are referenced in this book.

Three of us, the authors of this book, decided to take this initial work one step further and kept conducting research with the ultimate goals of overcoming the inevitable limitations inherent in our initial work, further developing patterns, offering more comprehensive pattern descriptions, and making this knowledge accessible to a wider audience. Three years down the road, we are finally able to present the results of this work, which is the book you are holding in your hands.

This book is not meant to be the final word on patterns for sustainable business models. On the contrary, it is meant to stimulate an ongoing conversation.

## The authors



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Florian has studied sustainable business models for more than a decade and published various highly-cited journal articles in this field, in journals such as *Business & Society*, *Business Strategy and the Environment*, *Journal of Business Ethics*, *Journal of Industrial Ecology*, and *Organization & Environment*. As Associate Editor of the *Journal of Business Models* and Co-Chair of the International Conference on New Business Models he is passionate about developing a vibrant community of sustainable business model experts. Florian holds a PhD in Economics and Social Sciences from Leuphana University and obtained his habilitation in Business Administration from the University of Hamburg.



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Since 2001, Henning has worked with multinational corporations, SMEs, public organisations, and start-ups, providing consulting on sustainable innovation culture and business models, future scenarios, and ethnographic stakeholder research. Henning co-authored numerous journal and conference publications and, together with Florian, a seminal textbook on Values-Based Innovation Management. As a visiting researcher and professor, he has worked at the University of Chile (Santiago) and Waseda University (Tokyo). Before, he studied psychology, philosophy, and law in Berlin and Tübingen, and received his PhD in Psychology from the University of Magdeburg.



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# Acknowledgements

We want to thank many generous friends and colleagues for their help along the way.

To start with, we would like to thank and acknowledge the contributions of Alexandre Joyce and Sarah Carroux. Both worked together with us on an earlier academic research project, which, in many ways, can be considered as having laid the initial foundations for this project. We are indebted to Alexandre for drawing our attention to Christopher Alexander's wonderful work on pattern theory when we were conducting an extensive review of the sustainable business model literature. This has shaped our approach to classifying and describing sustainable business models in many ways. Sarah, at the time a graduate student, enthusiastically accepted the offer to work with us on this research project, offering tremendously valuable support with data gathering and analysis.

A great thanks goes to our graphic designer Falko Ohlmer and his team at Arndt Benedikt GmbH. They gave *Sustainable Business Model Design* a unique look and feel, following the idea that a book about design should itself follow high standards in terms of its visual appearance. We are very thankful to Falko, Marc Boetzius, Ines Feyrer, Eva Hammerschmidt, Alicia Loske, Dominique Kirsch and Katharina Rückert for their great design ideas and tireless support.

The same goes to our copyeditor, Paul Lauer. Paul went far beyond what we experienced with copyediting so far. He was heavily invested in our project, to say the least, edited every chapter and every pattern several times and regularly challenged us to be clearer in how we express our vision of *Sustainable Business Model Design*.

We would also like to warmly thank the group of experts who helped validate and refine the original pattern taxonomy: Florian Andrews, René Bohnsack, Maya Hoveskog, Henriette Melchiorson, Samuli Patala, Romana Rauter, Francesco Rosati, Nils Thorsen, Benjamin Tyl, and Antony Upward.

We are fortunate to have a wonderful group of friends and colleagues who provided extremely valuable feedback and help on the patterns, earlier versions of the manuscript, and the book's design: Florian Andrews, Jan Auernhammer, Geanne van Arkel, Dorothee Baumann-Pauly, Sophie Bernhardt, Lara Anne Blasberg, Toni Davila, Krzysztof (Chris) Dembek,

Tobias Froese, Oliver Gassmann, Raz Godelnik, Stefan Gold, Marc Gruber, Lorenz Grünewald-Schukalla, Frank Heidmann, Gabriele Heinzl, Roman Meier-Andrae, Laura Michelini, Bruno Oberle, Romana Rauter, Mike Rosenberg, Heinrich Schwarz, Sharon Tal, Chris Tucci, Rama Velamuri, Peter Wells, and Thomas Wunder. Sorry, if we missed someone here.

A warm thank-you also goes to Charleen von Kolpinski, who helped checking the many details of the final manuscript and to Kiril Ivanov, who provided substantial research assistance in the early phases of this project.

Additional support came from the institutions we work with and for, namely ESCP Business School Berlin and the Chair for Corporate Sustainability; HMKW University of Applied Sciences for Media, Communication and Management; UXBerlin - Innovation Consulting; Aalborg University (AAU) and the Business Design Lab; and École Polytechnique Fédérale de Lausanne (EPFL).

Finally, *Sustainable Business Model Design* would not have been possible without our families. They accepted that this book project was a part of our lives, at any time and everywhere in the past three years, after regular working hours, on weekends, and even during family vacation. Thanks so much for your understanding and support!

# I Introduction

“The people can shape buildings for themselves, and have done it for centuries by using languages which I call pattern languages.

A pattern language gives each person who uses it, the power to create an infinite variety of new and unique buildings, just as his ordinary language gives him the power to create an infinite variety of sentences.”

Christopher Alexander

Christopher Alexander (\*1936) is an architect and key figure in the pattern language movement. His books *A Pattern Language* (1977) and *The Timeless Way of Building* (1979) are milestones in the development of pattern theory.<sup>1</sup>

# Why you should read this book (and why you shouldn't)

This is a book *for* sustainability and not *about* sustainability. At its core, it is about designing next generation business models for sustainability, that is, business models designed to maintain and create value in ecological, social, and economic terms.<sup>2</sup> In this book we will simply call them sustainable business models.

We will not go over once again the all too familiar ground about why sustainability matters, whether for each of us as individuals or for businesses. Nor about why businesses should behave in a socially responsible way or whether it pays to be green. There are already many insightful books, articles, and talks on these topics. And since you are reading our book, the chances are high that you are already aware of them.

This is a book for creative and adventurous minds who want to make sustainability work. For individuals with a bias for action and a passion for tangible results. For those entrepreneurs and managers, innovators, product and service designers, corporate social responsibility managers, and many more who are eager to overcome the business-as-usual mindset and share with us the belief that business models are powerful tools in this endeavour.

This is a book for creative and adventurous minds who want to make sustainability work.

Read this book if you are interested in the design of sustainable business models.

## Why we wrote this book

We are convinced that business – from entrepreneurial startups to large multinational corporations – has a vital contribution to make to sustainable development. But we are also convinced that this will not happen without radically different business model designs. New sustainable technologies, products, and services will never be able to reach their full potential until new and innovative business models are put in place.

Business has a vital contribution to make to sustainable development. This requires radically different business model designs.

Many entrepreneurs and corporate managers are well aware of this and have already started experimenting with new business models to boost sustainability. Yet, knowledge about business model designs for sustainability has not been systematically organised and shared.<sup>3</sup>

In writing this book, and trying to better understand how business can create sustainable value, we were guided by three questions:

- What types of sustainable business models do we already have?
- What solutions do they offer to recurring environmental, social, and economic challenges?
- How can we turn these solutions into templates for action?

Guided by these questions and by a deep conviction that business can be a driving force in the transition towards sustainable development, we wrote this book with the goal of providing the know-how that would support managers, entrepreneurs, and intrapreneurs alike in designing sustainable business models.

## What you will find in this book

At its heart, you will find 45 patterns for sustainable business model design, that is, innovative business model designs that will help you create ecological, social, and economic value for your stakeholders.<sup>4</sup>

Patterns are a classic way of capturing and communicating knowledge in architecture or engineering and, more broadly, in design disciplines. In other words, in those disciplines that focus on the design of useful things that help achieve pre-defined purposes.<sup>5</sup> Whether these useful things take the shape of physical artefacts (a bridge), devices (a smartphone), services or interventions (healthcare processes), or, as in our case, business models.

Patterns represent the essence of solutions typically used to tackle recurrent challenges in a given field or discipline. They are generalised problem-solution combinations. So, business model patterns are generalised business model solutions to recurrent problems in the value creation activities of organisations.

We have identified and systematised 45 patterns for sustainable business model design, each of which addresses various recurrent challenges that prevent business from creating more ecological, social, and economic value. A group of ten outstanding experts

in sustainable business model research and practice helped to validate these challenges and their corresponding business model patterns and to locate them on the sustainability triangle used throughout the book.

In this book, you will learn more about these recurrent sustainability challenges and about the solutions each of the 45 patterns provides. You will also see how organisations have successfully implemented these patterns.

We also describe how these different patterns can be combined to solve more comprehensive challenges and to create greater sustainable value. We see this process as learning a pattern language. Just as words can be combined to form sentences and whole stories, so too can the patterns presented in this book be combined to create new business models, up to the point where whole organisations are radically transformed.<sup>6</sup>

## What is a pattern for sustainable business model design?

Patterns for sustainable business model design are blueprints for developing new business models, or for changing existing ones, with the deliberate aim of creating sustainable value through business means. This is a mid- to long-term undertaking, and admittedly not an easy one. But patterns provide a quite powerful shortcut to learning the essence of decades of experience – experiences often made by those who pioneered new ways of doing business, such as Interface Inc. or Aravind Eye Care System (see pp. 31, 66, 93).<sup>7</sup>

Patterns for sustainable business model design are blueprints for creating sustainable value.

Well-known patterns such as ‘freemium’ and ‘razor and blade’ are included in our pattern classification<sup>8</sup> (and further developed into *Social Freemium* and *Green Razor and Blade*) as well as less common business model designs supporting a *Two-Sided Social Business* or establishing an *Industrial Symbiosis*. These patterns are organised into 11 groups (including, for example, **ECODESIGN** and **CLOSING-THE-LOOP** patterns, **SOCIAL MISSION** patterns, and **FINANCING** patterns) each emphasising the relative strengths of different business model designs to contribute to ecological, social, and economic value creation.

It is important to see the identification and implementation of business model patterns as an ongoing and open-ended process.<sup>9</sup> New patterns will continue to emerge as individuals experiment with business models to create sustainable value. In fact, we appeal to you, our readers, to share and propose new patterns.

## How to use this book

This book does not contain a method that will always work in every case.<sup>10</sup> There is no magic recipe or failsafe pathway to successful and sustainable business and organisation design. And, indeed, our ambition is not to offer the ultimate guide to sustainable business model design. As we doubt this is even possible. Instead, our ambition is to provide you with actionable insights, inspiring cases, and useful design know-how.

You can use this book as both a bird’s-eye overview of the subject and as a down-to-earth guide to action. We hope you will find this book a source of inspiration to overcoming conventional ideas about how business is done. Read the patterns and the case studies to see how they can be applied to your own organisation and how they might help you overcome the barriers you are facing in your own sustainable innovation projects.

You can use this book as both a bird’s-eye overview of the subject and as a down-to-earth guide to action.

You are also invited not only to share and propose new patterns but to challenge our pattern classification. After all, it is only through constructive criticism and the iteration of different versions of a design that something useful is created. And this also holds for the approach to sustainable business model design we introduce in this book.

*Where to go from here?* If you would like to review some of the concepts we use in this book – for example, business model, value creation, or business design – continue with Chapter 2. Our pattern system – consisting of 11 pattern groups and 45 patterns – and how to navigate it is explained in Chapter 3. But if you are keen to learn more about what the 45 patterns actually look like, skip to Chapter 4, where all the patterns are presented in detail. If you are more interested in learning how to work with patterns, go to Chapter 5. Or you can start by simply browsing through the book. Let your curiosity be your guide!

# Sustainable Business Model Design – The Idea in Brief

“Everyone designs who  
devises courses of  
action aimed at changing  
existing situations  
into preferred ones.”

Herbert Simon

Herbert Simon (1916-2001), winner of the 1978 Nobel Prize in Economics, was one of the most influential social scientists of the 20th century. His research ranged from administration and economics to artificial intelligence and cognitive psychology. His book *The Sciences of the Artificial* (first edition 1969), is a seminal text for many design scholars.<sup>11</sup>

We tend to take for granted that some things – buildings, products, and technologies – are designed. These things, or artefacts, are the product of human intention and action. They wouldn't exist if we didn't want them to exist.

We also take it as self-evident that some professions, such as engineering or architecture, are about designing things. That engineers and architects are devising, as Herbert Simon puts it, 'courses of action aimed at changing existing situations into preferred ones.'<sup>12</sup>

But this is not how we have traditionally thought about the work of managers. Although things have been changing over the last decade or so. The role of design and designing – of managers as designers – is now increasingly seen as central to management practice.<sup>13</sup>

This book was inspired by that shift in thinking. Similar to products, technologies, and other constructed artefacts, businesses and organisations can be designed or redesigned to make a greater contribution to sustainable development – an approach we call *sustainable business model design*.

Creating more sustainable value means limiting negative impacts on the natural environment and society for whole product life cycles across whole value chains and over the long term. It means creating value not just for a company and its shareholders, but for all societal stakeholders. It means respecting the Earth's planetary boundaries and the foundations of human life.<sup>14</sup> In the best case, it means going beyond reducing the negative impact of business activities and restoring the natural and social capital we are using up so recklessly.

Business has the potential to create more sustainable value. This is a decisive opportunity. Companies are largely responsible for the environmental devastation we are now facing, but they also have the knowledge, skills, and resources to creatively solve sustainability challenges and foster a more sustainable future.<sup>15</sup> Business is a formidable engine of innovation.

But as long as we are confined by traditional ways of thinking about business models – often rooted in industrial age ideas about mass production and consumption – it will be impossible to fully unlock the potential of innovation to create sustainable value.

Businesses and organisations can be designed to contribute to sustainable development. That's sustainable business model design.

Creating greater sustainable value requires us to rethink and re-design our way of doing business. In short, it requires innovative business models that are oriented towards greater sustainability. It requires us to develop sustainable business models.<sup>16</sup>

One way to do this – the perspective we have taken in this book – is by understanding the nature of the challenges that sustainable value creation comes up against and learning how innovative companies have devised solutions to these challenges and integrated them in their own business models. In other words, we can be inspired to create greater sustainable value by learning from existing patterns for sustainable business model design.

A *pattern for sustainable business model design* is a repeatable solution to enduring environmental, social, and economic challenges that arise when an organisation aims to create, deliver, or capture value in a sustainability-oriented manner.<sup>17</sup>

A pattern encapsulates knowledge in the form of a general rule: *If you want X, do Y*. This is why we say that a pattern offers knowledge for action. It shows us how to design solutions to enduring sustainability challenges – across organisations and across whole industries.

There are four things we should keep in mind when working with patterns.

First, many of the patterns presented in this book emphasise the tension between creating ecological and social value and reaching those goals profitably. Our focus is on the private sector, on companies. But, most if not all of the patterns we discuss also apply to other types of organisations, including non-profit and not-for-profit ones.<sup>18</sup>

Second, a pattern cannot be transformed directly into a set of actions or a plan. It's not a recipe. Instead, it's a template for designing a solution to a sustainability challenge, for contributing to sustainability through sustainable value creation. This is the advantage of working with patterns. Their solutions can be transferred from one company to another, and from one industry to another. But they have to be adapted to the conditions encountered by each company and organisation.

Third, the patterns we present in this book are patterns for designing business models for sustainability. Each of them

Patterns can support sustainable business model design, and hence sustainable value creation.

offers a solution to a sustainability challenge, but even taken together they do not address all aspects of sustainability. The goal of becoming a fully sustainable business or designing a fully sustainable business model is, perhaps, idealistic. But this should not discourage you. Some companies and organisations show that it is possible to get pretty close to a wholly sustainable business model – acknowledging that they are of course not perfect. Aravind Eye Care System, Ecosia, Patagonia, and the Grameen Bank to mention a few (see pp. 31, 66, 129, 217, 266).

Fourth, patterns vary in many ways. An important distinction is in terms of scope. Each pattern in this book describes a solution to a sustainability challenge, but some apply to the whole business model, which we call prototypical patterns; others, modular patterns, to some of its parts; while still others, overarching patterns, to business and organisation design as a whole.<sup>19</sup>

Patterns also vary in their focus. One might address a particular environmental or social problem, but leave aside considerations of how this can be done profitably. Another might have a stronger focus on profitability, but not say much about how this can contribute to solving a specific environmental challenge. For each pattern in this book, we identify related patterns it can be combined with. Because real world sustainability challenges often require that we refine, adapt, and combine different patterns simultaneously if we are to design effective solutions.

There are two complementary approaches to using patterns. In the problem-solving approach, patterns are used to identify solutions to already known challenges. While in the generative approach, patterns are used to identify new opportunities for sustainable value creation.

#### Philips – Let there be light

Philips's 'Pay-per-lux' customers benefit from high-quality lighting products installed, for example, in large office buildings.<sup>20</sup> But they don't have to own and maintain the lighting system themselves. This is done by Philips. The company takes care of the lighting system, from installation to end of life. This *Result-Oriented Service* business model builds on the idea of selling light as a service, and not as a product. Business customers pay a regular service fee for the light – the 'lux'. Selling lightbulbs is yesterday's news. And, importantly, ecological value is created as Philips has the incentive to use

as little resources as possible for its lighting systems. *Sustainable Product Design* and *Resource Efficiency and Productivity* are major design principles applied to this product-service system. *Take-Back Management* and *Upgrading* help increase resource efficiency even more.

#### Aravind – Social Freemium pioneer

In the 1970s, Dr. Venkataswamy was seeking new ways to fight the needless blindness that millions of Indians were suffering from. He founded Aravind Eye Care System and introduced several innovations to the medical treatment of eye diseases. Inspired by the McDonalds' model (that is, standardised processes, product recognition, accessibility, and scale.), he worked to streamline and scale up eye care services. 'Just as fast food is affordable to many lower middle-class families in the West, in developing countries we can organize to provide affordable cataract operations,' he declared in the late 1980s.<sup>21</sup>

Campaigns raise awareness amongst the rural population. Material costs are minimised through local production of high-quality intraocular lenses. This all contributes to a business model that builds on equity as a core value and a particularly powerful design principle: '50% of its patients receive services either free of cost or at steeply subsidised rate.'<sup>22</sup> The revenues from fully paying patients are used to cross-subsidise free treatments for those who cannot pay. The quality of treatment is the same for all patients, but paying patients have amenities such as air-conditioned hospital rooms with a smaller number of beds. It works because Aravind applies an 'assembly-line' approach and conducts nearly half a million surgeries per year, creating massive economies of scale – for the sake of their patients. This *Social Freemium* business model turned the hospital chain into the world's largest eye care provider.

# II Sustainable Business Model Design – Background

“... these new business models — where stakeholders replace shareholders as the focus of value maximization — could empower capitalism to address overwhelming global concerns.”

Yunus, Moingeon & Lehmann-Ortega

Yunus, M., Moingeon, B., & Lehmann-Ortega, L. (2010). Building social business models: Lessons from the Grameen experience. *Long Range Planning*, 43, 308-325.

# What is a business model?

While there is much debate about how to define a business model – what its components are, how it can best be represented, whether it can be evaluated or not, and so on – there is agreement at a very general level. A *business model* describes how a company does business.<sup>1</sup> Or, as the organisational theorist David Teece puts it, a business model ‘describes the design or architecture of the value creation, delivery, and capture mechanisms [a firm] employs.’<sup>2</sup>

A business model describes the design or architecture of the value creation, delivery, and capture mechanisms a firm employs.

Of course, companies have always had business models. It is only recently though that the concept of the business model has become popular. This came to a head in the mid-1990s with the advent of the internet and communication and information technologies when entrepreneurs began experimenting with new ways of organising exchanges and transactions. These new ways of doing business became known as innovations in business models.<sup>3</sup>

Examples of innovative business models include providing a product for free while generating revenue elsewhere (Facebook) or offering a free, reduced-feature version of a service while making money with a premium version (Dropbox or Adobe). Or creating modular offerings, selling the primary product cheaply and making money with relatively expensive disposables (Gillette or HP).

*Business model innovation* redefines how products and services are combined into offerings, how customers and other stakeholders access and use these offerings, and how companies generate revenues from these activities. Innovation in products and services, in processes, and in organisational design is undoubtedly important, but it does not involve innovating the logic of how a company creates value. Business model innovation has this potential. It has rightly been called a ‘new dimension of innovation’, one that is different from but complementary to other more run-of-the-mill dimensions of innovation.<sup>4</sup>

Business model innovation has attracted interest because it promises to have a high impact on performance. Think of Xerox, who in 1959 developed a revolutionary leasing model, making it one of the most profitable companies of the time. Or of Google, whose advertising business model has made it one of today’s revenue leaders. Business model innovation has

also attracted interest because it can be disruptive, redefining entire industries or giving birth to new ones. Think of multi-sided platforms such as Airbnb or Uber. Business model innovation is often behind offerings that radically reinvent customer value. Think here of Ryanair’s cheap flights or IKEA’s flat pack and self-assembly furniture.<sup>5</sup>

But, as we show in this book, business model innovation can also unlock the potential of companies to contribute to sustainable development by creating sustainable value.

# What is value creation?

Since business models are about value creation, let’s now turn to what value and value creation are. A seemingly simple question that is anything but trivial to answer.

The concept of value is at least as old as recorded history – it was discussed by Aristotle 2,500 years ago – and the concept of value creation has kept scholars busy for centuries.<sup>6</sup> With that in mind, we offer a broad-brush overview that we hope will be sufficient for our purposes.

In standard economic theory, as well as in management theory, *value creation* is understood to comprise three aspects. The delivery of benefits to customers, of revenue to the company, and, indirectly, of benefits to society stemming from the economic activity of the company. Value is created for a company’s customers, who purchase products and services to ‘get an important job done.’<sup>7</sup> The profit a company makes from these sales creates value for its investors. And as a consequence of this economic activity, businesses pay taxes and create employment, thus creating value for society.<sup>8</sup>

For sustainable innovations, such a view on value creation would be too limiting. We need a more comprehensive understanding.<sup>9</sup> To begin with, we need to consider the impact on the natural environment and to understand how a company creates value for society. A company is more than its owners and customers. Other stakeholders affected directly and indirectly, positively and negatively, by the activities of a company include its employees, suppliers, the community, the government, and others. When we consider their values and interests as well, we see how value creation is related to broader ecological, social, and economic impacts.<sup>10</sup>

The motivation to contribute to a more sustainable world often begins with a review of our values and ‘systems of priorities.’<sup>11</sup> This helps us define the meaning and purpose of our endeavours and then devise appropriate courses of action. The successful design and implementation of business models for sustainability requires a deeper understanding of value creation, one that goes beyond the market to include various societal stakeholders and the natural environment.<sup>12</sup>

## What is a sustainable business model?

We call business models with the potential to help solve sustainability challenges and contribute to sustainable development business models for sustainability,<sup>13</sup> or simply sustainable business models.

A *sustainable business model* is one whose rationale for value creation, delivery, and capture allows an organisation to contribute to solving sustainability challenges and to promoting sustainable development.<sup>14</sup> Or, in the language of global sustainability governance frameworks, sustainable business models contribute to reaching the United Nations Sustainable Development Goals (SDGs).<sup>15</sup>

Consider a company that has decided to shift from selling its products to leasing them. This decision unlocks further opportunities for it to make its products more durable and repairable, which not only has the potential to increase customer value but also contributes to reducing resource consumption. Such opportunities arise only because the company has engaged in business model innovation.

What types of sustainable business models do we already have? What solutions do they offer to recurring environmental, social, and economic challenges? How can we turn these solutions into templates for action?

The 45 patterns offered in this book are the result of an attempt to answer these questions. This book synthesises the knowledge and insights relating to how real-world business models have

*A sustainable business model is one whose rationale for value creation, delivery, and capture allows an organisation to contribute to solving sustainability challenges and to promoting sustainable development.*

contributed to solving persistent sustainability challenges, across companies, industries, and geographies.

Each of these solutions is necessarily a partial solution. This means that business model innovation based on these patterns will invariably fall short of being fully sustainable. The goal of creating a fully sustainable business is, in this sense, idealistic,<sup>16</sup> even if there are notable examples of companies that come close to this goal. We already pointed out examples such as Aravind Eye Care System, Ecosia, Patagonia, or the Grameen Bank to mention just a few (see pp. 31, 66, 129, 217, 266).

But each pattern does contribute, whether on its own or in combination with others, to companies seeking to envision and design more sustainable business models.

## What is business design?

Design means different things to different people. In the fashion industry, it might be associated with style. In architecture and engineering, it is often about building things. But design also applies to social systems – in this book, to businesses and other organisations.<sup>17</sup>

Business is a formidable engine for innovation. It has enormous potential to solve problems and create value at the intersections of the economy, society, and the natural environment. Unlocking this potential, however, cannot be done within the boundaries of traditional ways of thinking, using the business models we have inherited from the industrial economy and the ideas of mass production that accompanied them. We have to creatively rethink the rationale behind how companies create, deliver, and capture value. We have to ask new questions, develop new solutions, and find new ways to do business. We have to adopt a design mindset.<sup>18</sup>

A design mindset is not about manoeuvring for marginal gains within existing markets. It is about rethinking and changing those markets. It is not about using historical data to predict the future. It is about creating a vision of a desirable future state, and then imagining a pathway to it.<sup>19</sup> A design mindset contemplates and explores possibilities outside the boundaries of how we have traditionally seen the world.

Business design means applying a design mindset with its methods, tools, and knowledge to businesses and organisations in order to boost innovation and solve challenges.<sup>20</sup>

Design plays an important role in this book - starting with the title - because it invites us to rethink the possibilities inherent in businesses and other types of organisation. Design involves creativity and imagination, values and a vision. And it involves innovation.<sup>21</sup>

Envisioning a world in which business uses its innovation capabilities to turn sustainability challenges into opportunities for fair profits and create more sustainable value is only a starting point. Designing sustainable business models also needs the tools and knowledge for business design, and it needs experience with design methods.

This book is not about design methods - such as design thinking, strategy sprints, and other iterative methods - as crucial as they are.<sup>22</sup> This book is about tools and knowledge for designing sustainable business models. Our goal is to give you what you need to make informed design choices to create more inclusive business models that meet the environmental and social challenges we face today. These are the 45 patterns we present in this book.

# III

## Understanding and Navigating Patterns

“The limits of my  
language mean the  
limits of my world.”

Ludwig Wittgenstein

Wittgenstein, L. (1922). *Tractatus Logico-Philosophicus*. International Library of Psychology, Philosophy and Scientific Method. Kegan Paul, Trench, Trubner & Co.

# Patterns for sustainable business model design

The search for inspiring examples and types, such as the Dell model of mass customisation or the Adobe model of freemium software products, has long been part of research into business models. Early approaches distinguished only a handful of internet business models, while nowadays extensive and specialised classifications of business models are available for various domains,<sup>1</sup> including sustainability.

Patterns, like examples and types, offer a means to classify business models. But patterns are different. They also pass on knowledge about proven solutions to recurrent challenges, thus serving as design tools. In a word, patterns are practical.

Patterns are key to such fields as architecture and software engineering or interaction design. According to Christopher Alexander, an architect and design theorist who was instrumental in developing pattern theory, a *pattern* 'describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice.'<sup>2</sup>

In essence, patterns are problem-solution combinations that encapsulate knowledge in the form of a general rule: *If you are confronted with problem X, consider trying solution Y.* Patterns offer knowledge for action.

Patterns for sustainable business model design are about solving the challenges associated with the design of sustainable business models. We define a *pattern for sustainable business model design* as a repeatable solution to enduring environmental, social, and economic challenges that arise when an organisation aims to create, deliver, or capture value in a sustainability-oriented manner.<sup>3</sup>

Remember that while a pattern is a source of guidance and actionable insights into how to solve specific challenges,

Patterns pass on knowledge about proven solutions to recurrent challenges and serve as design tools. Patterns are practical.

A pattern for sustainable business model design is a repeatable solution to enduring environmental, social, and economic challenges that arise when an organisation aims to create, deliver, or capture value in a sustainability-oriented manner.

it is not a ready-made recipe. Patterns are abstractions from real-world situations. They offer general solutions to recurring problems that can be used in different ways in different contexts.

Because patterns are generalised abstractions, they can be easily combined to find even better solutions.<sup>4</sup> By all means, think about how business model patterns work for different purposes – such as designing value propositions or pricing mechanisms – and how they might work together to redefine business activities.

This possibility of combining patterns unlocks creativity – which is especially important for sustainable innovation as it pushes boundaries in so many ways.

# The Value and Beauty of Patterns

We can use an example from architecture to illustrate how patterns can be used. If the design challenge is to light a room in a natural and pleasing way, one solution is to have windows on two sides of the room: ‘When they have a choice, people will always gravitate to those rooms which have light on two sides, and leave the rooms which are lit only from one side unused and empty.’<sup>5</sup>

This pattern – called ‘Light on Two Sides of Every Room’ – describes a common challenge and proposes a time-tested solution that is detailed enough to be repeated by others, while at the same time open enough to allow for variation when designing, for example, rooms for condos and office buildings. Designers are able to learn from past experience and apply it to the specific challenges they are facing in the present.

# Pattern description

Every pattern begins with a one-page overview of the pattern, the *Pattern at a Glance*.

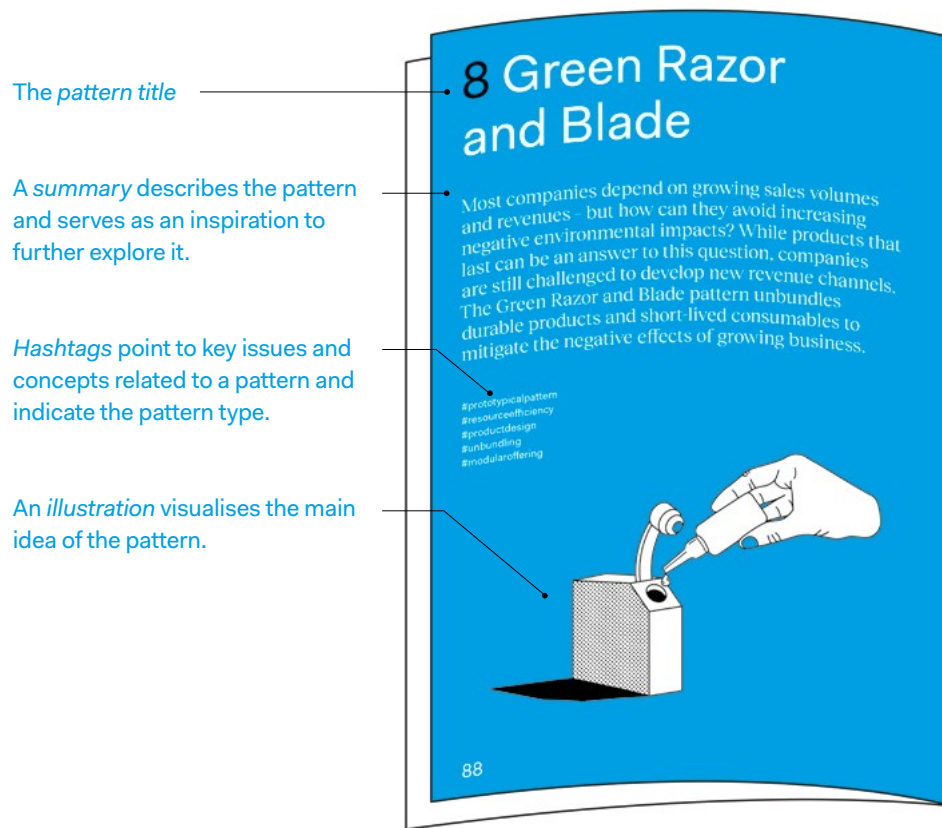


Figure 1: Pattern at a Glance

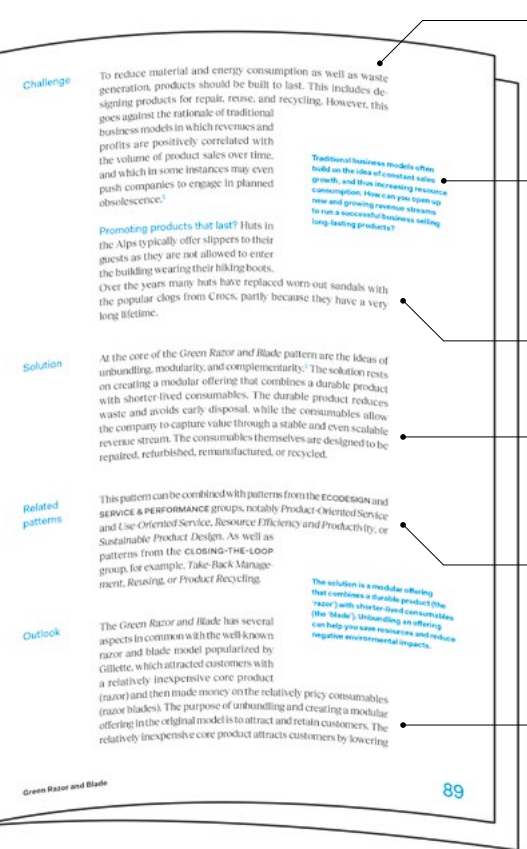


Figure 2: Elements of a pattern

The full pattern description, typically two to three pages, illustrates the *challenge* and the corresponding *solution*. *Cases* give real-world examples of the pattern's application. *Highlights* emphasise essential aspects of the pattern, while *related patterns* show some of the patterns that can be used in combination with it. An *outlook* offers further information about when the pattern would be most effective, what barriers and limiting factors there might be, as well as what its strengths are.

Each pattern describes a solution to a sustainability challenge, but the patterns differ in many aspects. We have organised the 45 different patterns into three pattern types and 11 pattern groups to help you find your way.

# Pattern types

Patterns differ in their scope.<sup>6</sup> After in-depth studies of each pattern in theory and in practice, we have identified three *pattern types*.

First are those we call *overarching patterns*, as they describe how you can integrate major design principles into any aspect of business and organisational design (for example, see the *Resource Efficiency and Productivity* pattern on p. 92).

The second type, *prototypical patterns*, are about how a company creates, delivers, and captures value, and so they serve to design or redesign the whole business model (for example, see the *Green Razor and Blade* pattern, which touches on various components of the business model, from product design to revenue model, on p. 88).

The third type are so-called *modular patterns*, which show how you can innovate a specific part - or module - of your business model, whether resources, processes, products, communication channels, revenue sources, or something else (for example, see the *Sustainable Product Design* pattern on p. 96).

Modular patterns can complete or complement prototypical patterns, just as they can help implement overarching patterns.

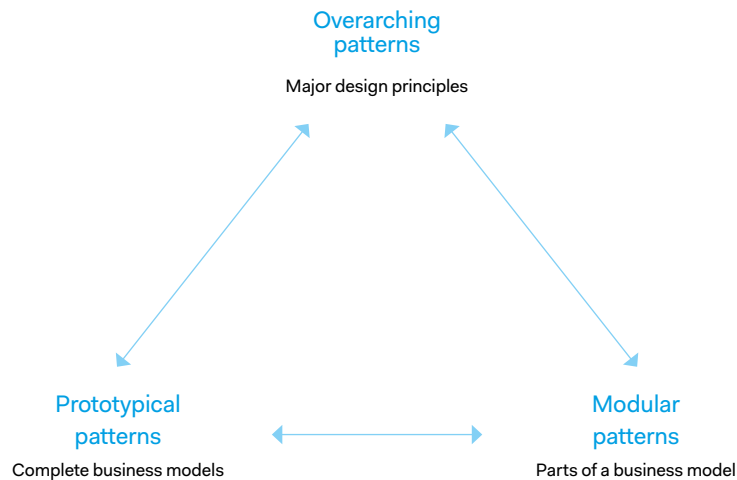


Figure 3. Three pattern types

While all this might imply some form of hierarchy, there is no strict top-down or other rule for using the different pattern types - you can combine the patterns according to your needs and liking.

Assigning the patterns to these three types allows you to see how the patterns differ in terms of their scope and how you can start working with them (see Chapter 5).

The pattern type can be seen in the hashtags on the Pattern at a Glance page: [#overarchingpattern](#), [#prototypicalpattern](#), or [#modularpattern](#).

## Pattern adaptation

Many modular patterns can be turned into prototypical business models and vice versa, meaning the same pattern can be implemented in different ways. For example, Novartis have used the modular *Market Maker* pattern to add new distribution channels to their existing business model (see p. 182). While companies such as eBay have designed their whole business model around this pattern.

Similarly, some companies offer *e-Transaction Platforms* as stand-alone services and build complete businesses around this prototypical pattern, as in the case of ZERO's branchless financial service business model. Others, such as Fino PayTech, use it to create additional channels to offer banking, insurance, and other services to their customers (see p. 185).

Or take *Product Recycling*, again a modular pattern. Companies that recycle their products themselves are using it as a means to better manage later stages of their products' life cycle. Companies specialised in providing *Product Recycling* as a service are basing their entire business model on this pattern, such as TerraCycle or GreenRedeem, who offer complete recycling schemes to their customers (see p. 118).

You see, patterns are flexible. We leave it to your creativity and imagination to figure out whether and how modular and prototypical patterns can also be used as overarching design principles, and vice versa. Without doubt, you will find some interesting opportunities to explore (see Chapter 5).

# Pattern groups

Besides distinguishing between three pattern types, we have organised the 45 patterns into *11 pattern groups*, depending on the nature of the challenge they address. For example, patterns that offer different ways of closing material and energy loops are clustered in the **CLOSING-THE-LOOP** group, while patterns that solve social and access issues are found in the **ACCESS PROVISION** group. Table 1 shows the 11 pattern groups, a short description of each group, and their associated patterns.<sup>7</sup>

<b>1</b>	<b>PRICING &amp; REVENUE</b> patterns define how the offerings of sustainable business models can be priced and revenues generated.	1 Differential Pricing 2 Social Freemium 3 Customer Financing 4 Subscription
<b>2</b>	<b>FINANCING</b> patterns suggest different ways of acquiring equity, debt, and operating capital to finance sustainable business models.	5 Crowdfunding 6 Microfinance 7 Profit Reinvestment
<b>3</b>	<b>ECODESIGN</b> patterns define how activities, processes, and offerings can be designed to improve the ecological performance of business models.	8 Green Razor and Blade 9 Resource Efficiency and Productivity 10 Sustainable Product Design 11 Renewable Resources and Natural Processes
<b>4</b>	<b>CLOSING-THE-LOOP</b> patterns integrate the idea of circular material and energy flows into business model design.	12 By-Product Synergy 13 Industrial Symbiosis 14 Online Waste Exchange Platform 15 Product Recycling 16 Remanufacturing 17 Repairing 18 Reusing 19 Take-Back Management 20 Upgrading
<b>5</b>	<b>SUPPLY CHAIN</b> patterns define how resource inputs are sourced and target markets are reached.	21 Green Supply Chain Management 22 Inclusive Sourcing 23 Micro Distribution and Retail 24 Virtual Sales and Distribution 25 Produce on Demand 26 Short Supply Chain
<b>6</b>	<b>GIVING</b> patterns enable the donation of products or services.	27 Buy One, Give One 28 Data for Social Good
<b>7</b>	<b>ACCESS PROVISION</b> patterns help create markets and provide offerings for otherwise neglected social target groups.	29 Market Maker 30 e-Transaction Platform 31 Experience-Based Customer Credit 32 Last-Mile Grid Service 33 Value-for-Money Education 34 Value-for-Money Housing
<b>8</b>	<b>SOCIAL MISSION</b> patterns show how to empower social groups to become productive partners and to turn their needs into demand.	35 Expertise Broker 36 Employing Minority Talent 37 Soup Kitchen 38 Socio-Economic Empowerment 39 Two-Sided Social Business
<b>9</b>	<b>SERVICE &amp; PERFORMANCE</b> patterns support dematerialising a business model by shifting from physical products to functions, services, and results.	40 Pay for Success 41 Product-Oriented Service 42 Use-Oriented Service 43 Result-Oriented Service
<b>10</b>	<b>COOPERATIVE</b> patterns integrate a broad range of stakeholders as co-owners and co-managers.	44 Cooperative Ownership
<b>11</b>	<b>COMMUNITY PLATFORM</b> patterns substitute individual resource or product ownership with community-based access.	45 Sharing

Table 1. 11 pattern groups and 45 patterns

# Pattern navigation

We provide two ways to navigate the patterns: the Pattern Triangle and the 11 Guiding Questions related to the 11 pattern groups. Both offer helpful shortcuts for you to find the right patterns to explore.

## The Pattern Triangle

The *Pattern Triangle* is based on a sustainability triangle with each corner representing one of the main dimensions of sustainable value creation: ecological, social, and economic.<sup>8</sup> The 11 pattern groups and the 45 patterns are located on the triangle in relation to their associated value creation potential. The blue-shaded areas represent the groups and the dots the individual patterns in each group. The numbers identify the groups and patterns as found in Table 1.

The positions of groups and patterns in the triangle indicate the extent to which they are associated with *ecological*, *social*, or *economic value creation*.<sup>9</sup> The closer a group or pattern is to one of the corners, the more it is associated with that form of value creation. Most groups and patterns are located somewhere between the three corners and are expected to create a mix of these three types of value.

For example, pattern group 4, **CLOSING-THE-LOOP**, is associated with the left side of the triangle between the ecological and economic corners. It consists of patterns such as *Take-Back Management*, *Reusing*, and *Product Recycling*. These patterns are expected to mainly contribute to ecological and economic value creation. Not surprisingly, patterns in this group are more distant from the social value creation corner.

On the other hand, groups such as **ACCESS PROVISION**, **GIVING**, and **SOCIAL MISSION** are located closer to the social value creation corner. The patterns in these groups help companies design business models that are inclusive towards often-neglected social groups and stakeholders.

The same logic applies at the level of individual patterns. For example, pattern 9, *Resource Efficiency and Productivity*, is primarily associated with ecological value creation (because it helps save natural resources). Pattern 35, *Expertise Broker*, is primarily associated with social value creation (because it helps those who need specialised knowledge and support). And pattern 45, *Sharing*, is equally associated with all three types of value creation (because it is an overarching design principle that can be applied in various situations).

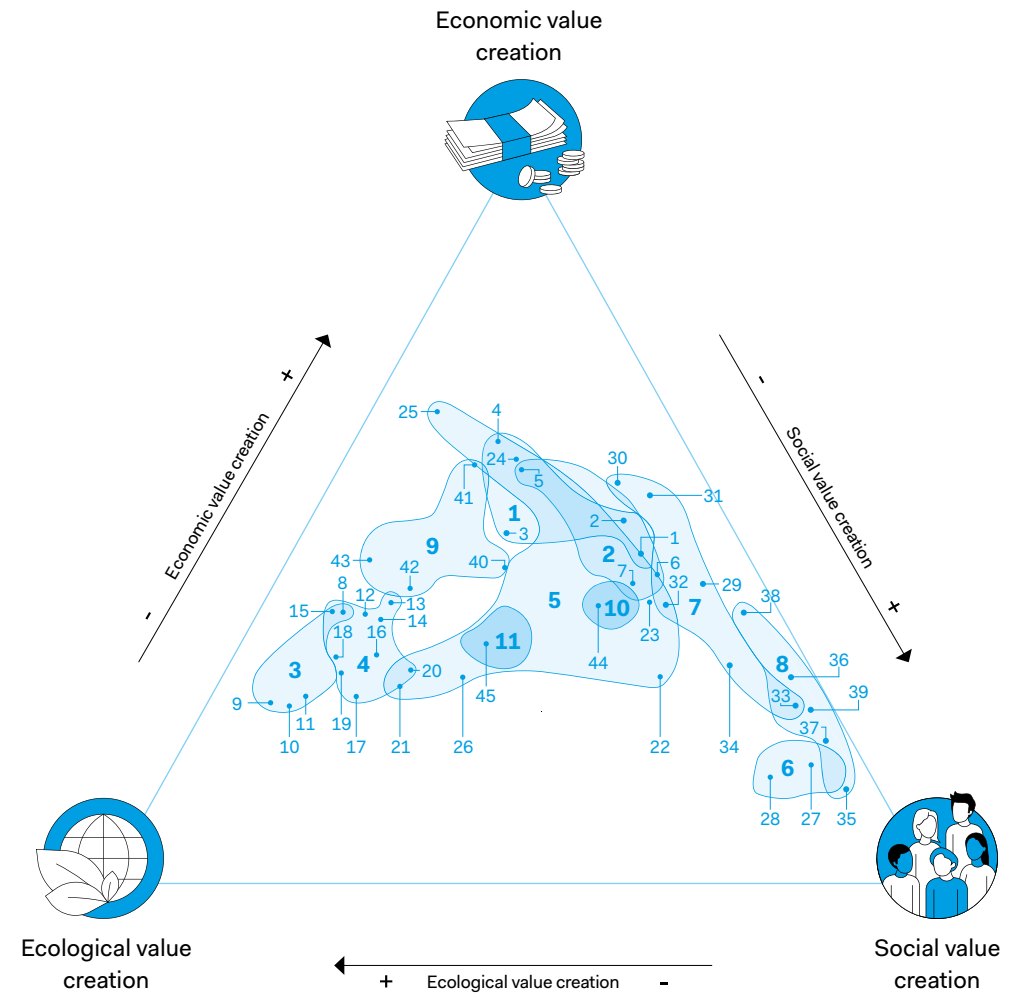


Figure 4. The Pattern Triangle

## 11 Guiding Questions

These *11 Guiding Questions*, one for each of the 11 pattern groups, offer another way of navigating the patterns. Rather than approaching patterns from the perspective of value creation, these how-to questions start with practical issues in sustainable business model design.

**1.** [How can I price offerings that are designed with ecological and social sustainability in mind while at the same time generate revenue with them?](#)

See the **PRICING & REVENUE** group for patterns showing how to make money sustainably through different pricing and revenue strategies for sustainable products.

**2.** [How can I finance business models designed to create more sustainable value?](#)

See the **FINANCING** group for patterns that describe different ways of acquiring equity, debt, and operating capital to finance sustainable business models. They illustrate ways to start sustainability initiatives by showing how they can be financed.

**3.** [How can I design business activities, processes, and products in more sustainable ways?](#)

See the **ECODESIGN** group for patterns that show how activities, processes, and products can be designed to improve the ecological performance of business models. They help improve eco-efficiency and eco-effectiveness and build on design for ecology.

**4.** [How can I design business models that help close energy and material loops?](#)

See the **CLOSING-THE-LOOP** group for patterns that propose nine ways to close the loop and that illustrate the value of eco-products, waste, re- and upcycling, and many more.

**5.** [How can I create a more sustainable supply chain?](#)

See the **SUPPLY CHAIN** group for patterns that show how to source resource inputs and reach target markets. They illustrate six strategies for supply chain sustainability, including green supply chains and innovative sourcing and distribution.

**6.** [How can I provide free products to those in need?](#)

See the **GIVING** group for patterns that show you how to offer a helping hand by providing offerings free of charge to social groups in need, while covering the costs in smart ways.

**7.** [How can I make products and services affordable for social groups in need?](#)

See the **ACCESS PROVISION** group for patterns that help create markets and provide products and services for otherwise neglected social groups. They illustrate six ways to make products and services affordable for underserved social groups by lowering access barriers.

**8.** [How can I turn a social group into my business partners?](#)

See the **SOCIAL MISSION** group for patterns that show how to empower social groups by turning them into productive partners and their needs into demand. They illustrate ways of creating social value by empowering people either as customers or productive partners.

**9.** [How can I offer services to replace physical products?](#)

See the **SERVICE & PERFORMANCE** group for patterns that support dematerialising your business model by shifting from physical products to functions, services, and results. They illustrate ways to emphasise the functional and service value of products and propose different types of product-service systems.

**10.** [How can I design more inclusive business models that actively involve stakeholders?](#)

See the **COOPERATIVE** group for patterns that offer a broad range of active roles for stakeholders as co-owners and co-managers in the company. These patterns democratise value creation by activating and integrating stakeholders.

**11.** [How can I provide access to the benefits of resources and products without necessarily providing ownership?](#)

See the **COMMUNITY PLATFORM** group for patterns that substitute individual resource or product ownership with community-based access. The patterns build on seeing resources and goods from the perspective of 'mine is ours', which supports forms of collaborative production and consumption.

## Pattern combination

Patterns can be combined in various ways. To start with, it is possible to combine different types. For example, modular patterns can be combined with each other to form complete business models, which can then resemble a prototypical pattern. These in turn can be seen as following certain overarching patterns.

Patterns can be combined in various ways.

Patterns can also be combined within a group. The overarching pattern *Renewable Resources and Natural Processes* is in the **ECODESIGN** group. It introduces the general principles of using renewable resources and making use of nature-inspired production processes. These principles are not about any specific parts of a business model or about the logic of value creation and capture. Instead, they offer a design orientation that can apply to any aspect of business and organisation design. This pattern can be combined with other **ECODESIGN** patterns, such as *Green Razor and Blade*, that support the design principle behind the overarching pattern. Other patterns from other pattern groups can, of course, be used as well.

Patterns can also be combined across groups. The pattern *Data for Social Good* in the **GIVING** pattern group describes different ways to create business opportunities in serving social and commercial markets. This approach can support patterns in the **SOCIAL MISSION** group (such as the *Socio-Economic Empowerment* pattern) or in the **ACCESS PROVISION** group (such as *Market Maker*).

Finally, patterns can be combined across groups and types. The modular *Subscription* pattern (**PRICING & REVENUE** group) describes how charging customers a recurring fee helps generate reliable revenue streams. This modular pattern also allows for more effective investment and risk management. It can be used to support prototypical patterns such as *Green Razor and Blade* (**ECODESIGN** group) and overarching patterns such as *Sharing* (**COMMUNITY PLATFORM** pattern group).

All 45 patterns contain information about related patterns that can be readily combined with each other. You can also navigate the patterns by following the related patterns from one pattern to the next.

All 45 patterns contain information about related patterns that can be readily combined with each other.

## Pattern language

Patterns are based on experiences, they are general rather than specific, they are flexible, and they can be combined with each other. These qualities make our classification a *pattern language* – even if a very rudimentary one.

After all, a language is a system of components (vocabulary) and structure (grammar) that allows us to communicate and convey meaning. And this is what a pattern language does. It allows its users to combine patterns to create a meaningful whole – in our case these are business model stories – that can be communicated to others. Our language is still missing specific rules, like a grammar, for combining patterns. But the related patterns sections provide, we believe, a starting point.

The seminal pattern language developed by Christopher Alexander consists of 253 patterns for urban planning and architectural design.<sup>13</sup> These are ordered in a hierarchical manner, from large structures (regions and towns) down to details of construction (such as doors and windows). Alexander refers to this hierarchy as a simplification of the language's structure, a network in which no pattern is isolated. Even more so, 'each pattern can exist in the world only to the extent that it is supported by other patterns: the larger patterns in which it is embedded, the patterns of the same size that surround it, and the smaller patterns which are embedded in it.'<sup>14</sup>

A pattern language allows its users to combine patterns to create a meaningful whole.

Once you start combining the patterns (see Chapter 5), maybe even together with other pattern classifications found in the Business Model Navigator or in the Business Model Pattern Database, you are in fact making use of a pattern language.<sup>15</sup> Needless to say combining patterns is an approach especially suited to sustainable business model design as sustainability challenges are multi-dimensional and often wicked problems.

Combining different patterns will inevitably lead to tensions and trade-offs and even paradoxical situations.<sup>16</sup> These should be met with creativity and a willingness to experiment. It is up to us as designers, innovators, entrepreneurs, managers, and researchers to create and put into practise new business models that advance the goals of sustainable development.

# IV

## 45 Patterns

“... some things are better left in the past. And true things are destined to repeat themselves.”

Suzanne Young

Young, S. (2014). *The Program*. A Program Novel Volume 1. Simon Pulse.

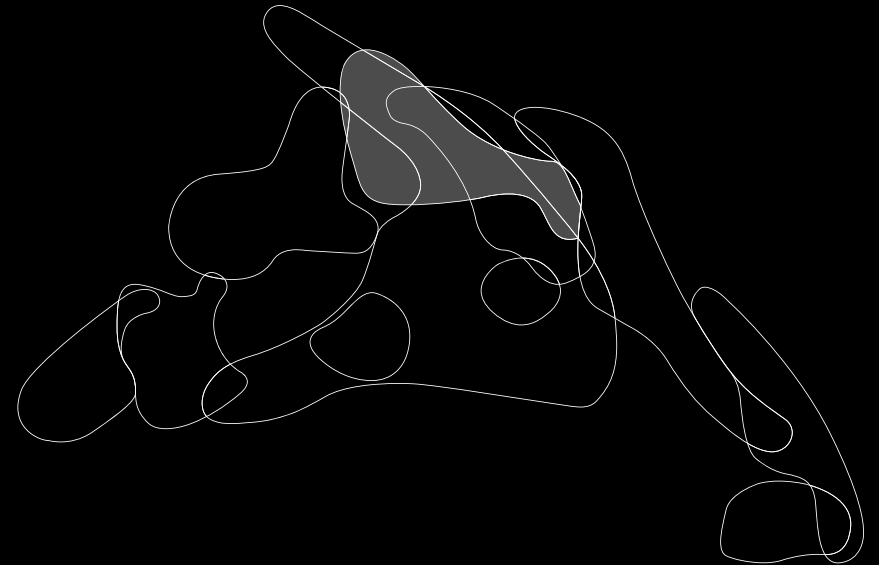
# Group

# 1

# Pricing & Revenue Patterns

These patterns define how the offerings of sustainable business models can be priced and revenues generated.

- Differential Pricing
- Social Freemium
- Customer Financing
- Subscription



# 1 Differential Pricing

Different target groups pay different prices for the same offering. Charging groups with higher payment thresholds higher prices can be a way to subsidise those in need who cannot afford to pay as much and lack access to basic and sometimes urgently needed products and services.

#modularpattern  
#pricing  
#customersegmentation  
#providingaccess



## Challenge

Although customers often need the same product or service, some are unable to pay as much as others. Different customer groups may have different payment thresholds. This turns into a critical social-economic issue if much-needed products and services such as food, shelter, healthcare, or education are too expensive for certain social groups (for example, people with relatively low income). As a consequence, these groups may lack access to much-needed products or services (for example, medical treatments), which can have detrimental effects on their well-being and living standard. This is an issue in both developed and developing countries where the majority of consumers spend a significant portion of their income to satisfy their basic needs.

Low-income groups might be unable or unwilling to pay for your products and services, although these are much needed. How can you provide access to these offerings?

**Providing healthcare for the poor.** Take health care as an example, where some 400 million people lack access to essential health-care services. And 6% of those living in low- and middle-income countries are at the risk of extreme poverty because of their spending on healthcare.<sup>1</sup>

## Solution

The *Differential Pricing* pattern allows companies to adjust the prices of their offerings to what certain customer groups can afford to pay, that is, higher prices for those with a higher willingness and ability to pay, and lower prices for those who cannot pay as much. This allows you to offer goods and services to customer groups who typically cannot afford them. Using this pattern creates benefits for otherwise excluded social groups. The underlying mechanism is that those with higher payment thresholds (partly) cross-subsidise those in need.

Differential Pricing can make your much needed products and services affordable for new customer segments, including those lacking sufficient purchasing power.

Using the *Differential Pricing* pattern modifies the pricing and revenue strategies of a business model. It also requires a certain approach to customer segmentation that considers both the needs of weaker social groups and their ability to pay. This 'social segmentation' also requires adjusting customer relationships and communication and delivery channels, as, for example, selling products and services in poor, rural areas differs significantly from offering the same products and services in a well-developed, wealthier urban setting.

**Insulin for developing countries and Novo Nordisk.** The relatively high prices of medical treatments in developing countries represent a barrier to low-income groups. Novo Nordisk has addressed this challenge by selling insulin in developing countries at prices that are up to 20% below the mean prices charged in Europe, or countries such as the USA, Canada, or Japan. In 2017, the company sold low-priced insulin to an estimated 5 million patients through its Access to Insulin Commitment.<sup>2</sup>

#### Related patterns

Companies can increase the availability of their offerings by combining *Differential Pricing* with patterns such as *Social Freemium* to emphasise the differences between offerings even more, or with *Micro Distribution and Retail* to increase geographical outreach. Providing free of charge products or services as part of a *Data for Social Good* model is another option, as is involving marginalised customers by engaging as a *Market Maker* dedicated to base of the pyramid offerings.

#### Outlook

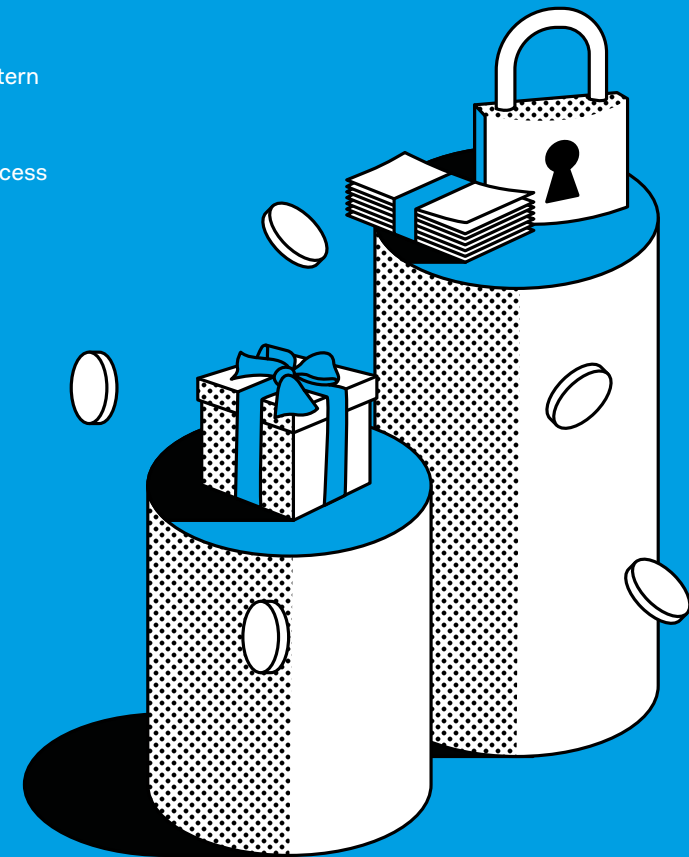
The *Differential Pricing* pattern can be a powerful approach to support the social-economic development of excluded stakeholder groups whenever huge differences in income and wealth exist, and when access to basic products and services is regulated through prices. This is critical in developing countries, but it is also an issue for rich industrial nations as these have their own BoP populations. This is, for example, illustrated by the striking inequalities in access to healthcare in the USA.<sup>3</sup>

Successfully applying *Differential Pricing*, also known as discriminatory pricing, builds on some specific requirements. Those paying higher prices must feel 'positively discriminated' (for example, through status upgrades) and there must be a common understanding that subsidising the poor is an important societal value that businesses share. Furthermore, direct comparisons between the offerings for high-end and low-end customers should be limited (for example, through geographical, product form, or other types of segmentation and differentiation).

## 2 Social Freemium

Ecologically and socially superior offerings often face a lack of demand. Limited purchasing power of target groups, competitors' lower prices, and a lack of experience can lead to critical market barriers. The Social Freemium pattern helps in overcoming these barriers with free basic offerings.

#modularpattern  
#pricing  
#unbundling  
#providingaccess



**Challenge** Sustainability-driven businesses often face a lack of demand for their products and services. This can have various reasons, including a lack of purchasing power of their target groups, higher prices than competing firms, or their potential customers' lack of experience with ecologically or socially superior offerings. These market barriers make it difficult for sustainability-driven businesses to disseminate their solutions and build the critical mass required for economies of scale.

How can you set in motion a virtuous circle of growing demand for your product, economies of scale, and widespread dissemination of better solutions?

**Making healthcare accessible.** In India, there is a great need for eye care treatment, but the majority of people in low-income rural areas are unable to pay for eye care services.<sup>1</sup> In addition to its devastating psychological and social effects, loss of sight often means the loss of one's livelihood.

**Solution** The basic idea of *Social Freemium* (free + premium) is to unbundle an offering and provide a basic service or product free of charge, while charging a fee for advanced features and functionality.<sup>2</sup> These free basic offerings allow businesses to serve customers who are unable or unwilling to pay, while money is made from customers paying for the premium offering. Thus, while conventional *Social Freemium* strategies focus on attracting more paying customers, in sustainability-driven businesses the focus is on expanding the reach of their ecological and social solutions. Products and services that reduce ecological and social harm, or even add ecological and social value, can gain access to new markets by applying variations of the *Social Freemium* pattern.

A free basic offering can make your sustainable value proposition more attractive to new customer segments, including those lacking sufficient purchasing power. The *Social Freemium* pricing pattern requires you to differentiate your offerings.

**Loss of sight and Aravind Eye Care System.** In India, there is a great need for eye care treatment, but the majority of people in low-income rural areas are unable to pay for eye care services.<sup>3</sup> In addition to its devastating psychological and social effects, loss of sight often means the loss of one's livelihood. Aravind Eye Care System,<sup>4</sup> a network of hospitals in India, operates a *Social Freemium* business driven by the mission to eliminate needless blindness. Similar to online *Social Freemium* models, such as Dropbox, where premium users finance the infrastructure and content for all users, Aravind utilises the revenues from its fully paying patients

to cross-subsidise free treatments for those who cannot pay. While the quality of treatment is the same for all patients, the paying patients have amenities such as air-conditioned hospital rooms with a smaller number of beds.

**Related patterns**

The *Social Freemium* pattern can be combined, for example, with the *Subscription* pattern or be used to generate additional revenue from a *Product-Oriented Service* or *Data for Social Good* model.

**Outlook**

The *Social Freemium* pattern benefits its users by giving them access to a valuable product or service at no cost. Among other things, this allows them to gain first-hand experience and then decide whether they want to pay more for a premium offering. In their purely commercial form, freemium models are often used when positive economic effects from scaling, such as decreasing marginal costs per user, require attracting as many users as possible. Although this pattern is commonly used in apps and web-based services, it can also be applied to other types of products and services. Whenever there are significant differences in income or the average purchasing power is low (for example, in developing countries), the *Social Freemium* pattern can increase the reach of solutions to both social and ecological sustainability challenges.

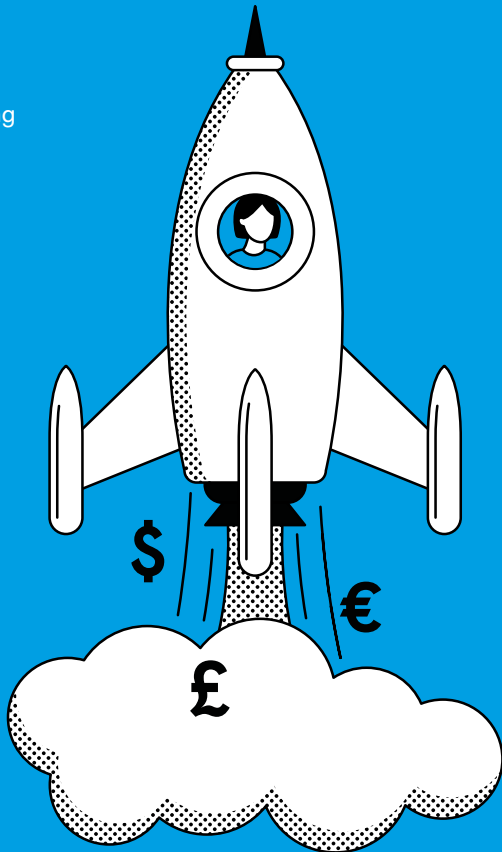
Countless companies providing digital services, including such giants as Google and Spotify, have proven the strength of the *Social Freemium* pattern. Sustainable businesses can also use it to create new and innovative business models.

Simulation modelling research has shown that the *Social Freemium* model can create a reinforcing feedback loop between value creation and value capture, making it a robust and scalable business model for sustainability.<sup>5</sup> A major issue concerning this pattern is achieving the right balance between paying and non-paying users so that the former fully subsidise the latter. This involves a company creating exceptional value and continuously improving its premium offerings.

# 3 Customer Financing

When potential customers cannot afford or do not want to purchase a new, uncommon, or radically different offering, the Customer Financing pattern can help. Leasing, renting, or progressive purchasing schemes can be a door opener for sustainable offerings.

#modularpattern  
#leasing  
#renting  
#progressivepurchasing  
#earlyadopters



## Challenge

Potential customers may be unwilling or unable to buy a product outright. Reasons include that the product is new and unfamiliar or initially more expensive than comparable products or services (for example, installing renewable energy home systems vs. purchasing power from the grid). This can inhibit the diffusion of ecological and social innovations. Too often user routines, convenience, and especially the price of an offering beat considerations of sustainability.<sup>1</sup>

Sustainable value propositions are often perceived as too expensive or too different. How can you still convince your potential customers they are worth buying?

## Mainstreaming sustainable technologies.

In India, for instance, millions of households in remote villages have limited or no access to electricity. But also in industrialised countries such as the USA, low- and middle-income customers are unable to benefit from solar home systems and, at the same time, to contribute to more sustainable means of production and consumption.

## Solution

The main idea behind the *Customer Financing* pattern is to use financing schemes that lower purchasing barriers on the side of customers. This includes targeting customers who are unable or unwilling to pay the full price of an offering upfront with opportunities for leasing, renting, or progressive purchasing.<sup>2</sup> Such financing schemes extend the depth and breadth of customer segments for new and more sustainable offerings, which often embed new technologies. While leasing and renting involve periodic payments, in some cases for a limited period of time, progressive purchasing schemes lead to full ownership after payment of a specified number of instalments. Price or investment barriers can be overcome by applying a financial life cycle perspective to new products, instead of aiming for immediate one-time revenues.

Pricing models and financing schemes aligned with low- and middle-income customers' purchasing power can make more sustainable products and their embedded technologies affordable.

## Solar power and PosiGen.

PosiGen is a US-American provider of solar power and energy efficiency solutions. Its Solar for All programme targets low- to middle-income households, offering a 20-year contract to lease a solar power system. Prices can be lower than typical power supply contracts and include services to optimise the household energy efficiency (for example, regular audits, facility upgrades). PosiGen partners with local banks

to provide leasing agreements without requiring a deposit or a credit or background check.

**Sustainable energy and Simpa Networks.** The Indian company Simpa Networks<sup>3</sup> makes sustainable energy affordable for India's rural inhabitants. The company charges only a small down payment for installation and regular pre-payments based on actual usage. Each payment adds up to the full purchase price and, once it is fully paid, ownership is transferred to the customer, who benefits from clean and reliable electricity at very low cost.

#### Related patterns

*Customer Financing* can be combined with patterns that provide product-related services, such as *Green Razor and Blade*, *Repairing, Upgrading*, and *Product-Oriented Service*. By regularly paying their instalments, customers demonstrate their creditworthiness and can be offered an *Experience-Based Customer Credit*.

#### Outlook

*Customer Financing* is an established practice in such sectors as housing, automobiles, or electronics. However, as an emerging sustainable business model pattern, *Customer Financing* can be applied to help overcome barriers to the adoption of new products. The pattern is becoming increasingly popular among tech start-ups, especially in the renewable energy and electric vehicle industries.<sup>4</sup> In the solar power industry, Tesla, Vivint Solar, Sunrun, and Sungevity allow their customers to finance renewable energy investments with long-term leasing contracts.

As companies retain ownership of the product throughout the entire contract period, they are responsible for repairs or replacement. This gives them an economic incentive to offer products that are more durable and easier to maintain. Offering complementary maintenance services enhances their value proposition and makes it more attractive to customers. However, such product-service bundles can make the business less straightforward to manage (for example, obtaining the license to offer leasing deals, setting up additional service infrastructures).<sup>5</sup>

# 4 Subscription

Inconsistent and unpredictable revenue streams can threaten a company's financial stability. This is even more critical for new players pursuing a sustainability mission. By charging customers a recurring fee, the Subscription pattern helps businesses generate reliable revenue streams and allows for more effective investment and risk management.

- #modularpattern
- #subscription
- #recurringfee
- #customeracquisition
- #customerrelationships



**Challenge** Companies riding a roller coaster of discontinuous revenues, with steep ups and downs, face a number of difficulties, including planning investments, taking operational decisions, and estimating supply needs.<sup>1</sup> This can also hinder their pursuit of sustainability objectives, such as the development and supply of new green technologies or much-needed products and services for neglected customer segments.

*As a new and small sustainability brand, how can you reach new customers and create recurring and predictable revenue streams?*

**Developing a customer base for new and sustainable offerings.** Sustainability-driven ventures, sometimes with radically new offerings, are often especially in need of answers to these two questions. Small conscious brands in industries such as sustainable food, health, beauty, or baby care often have a hard time acquiring a reliable and profitable customer base.

**Solution** In the *Subscription* pattern, customers are charged a recurring fee, typically on a monthly or annual basis, to access a product or service. As this fee is paid whether the product or service is actually used or not,<sup>2</sup> a business is better able to plan prospective investments and manage risks. This pattern can be particularly helpful for green and social start-ups – for example, conscious brands offering consumables – entering existing or new markets and needing to secure reliable revenue streams and customer relationships.

*Subscriptions based on bundles of sustainable consumables can be very attractive. Use the convenience of pre-selection and delivery to establish more stable revenue streams and customer relationships.*

**Offering subscriptions for natural products.** The Goodness Project<sup>3</sup> is an example of an e-commerce platform using the *Subscription* pattern. Every month it delivers to its customers boxes filled with a selection of wholesome, natural products such as food, beverages, and cosmetics. In addition to delivering high-quality products, The Goodness Project builds customer loyalty by donating 1% of net profits to a customer-selected charity. Thanks to its customer relationship strategy, the start-up has been able to gain traction in a crowded market.

**Related patterns** The *Subscription* pattern can be combined with the *Social Freemium* pattern or with additional maintenance services like those offered in *Green Razor and Blade*, *Repairing*, and *Product-Oriented Service* patterns. It can also be used to operate a *Virtual Sales and*

*Distribution* pattern or as a basis for offering *Experience-Based Customer Credit*.

**Outlook** The e-commerce subscription market has grown by more than 100% annually from 2013 to 2018, and has led to disruptions in a number of commercial sectors.<sup>4</sup> Using online channels, companies can combine all kinds of products and services with *Subscription* models. This enables the business to reach a broader customer base and the customer to lower their search costs for otherwise expensive regular purchases.

In addition to its financial advantages, the *Subscription* pattern can be used to promote more sustainable consumption by increasing the accessibility of products not widely available at conventional stores, as in the Goodness Project's monthly subscription boxes for organic products. In another example, Adobe shifted to cloud-based service subscriptions, allowing it to reduce waste, emissions, and other impacts related to the physical manufacturing, packaging, and distribution of its Creative Suite products.<sup>5</sup>

*Subscription* also poses some distinct challenges. Unsatisfied customers can easily cancel their subscriptions and switch to a competitor. Sustainable products are also increasingly available in local speciality stores and supermarkets. Negative impacts (such as additional traffic due to deliveries or power and resource consumption of server farms) and so-called rebound effects (for example, increasing total consumption because of lower purchase costs) must also be carefully considered.

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## I Introduction

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Liedtka, J., & Ogilvie, T. (2011). *Designing for Growth: A Design Thinking Tool Kit for Managers*. Columbia University Press.

Martin, R. (2009). *The Design of Business: Why Design Thinking Is the Next Competitive Advantage*. Harvard Business Press.

For overviews of tools suitable for sustainable business model design see, e.g., Breuer, H., Fichter, K., Lüdeke-Freund, F., & Tiemann, I. (2018). Sustainability-oriented business model development: Principles, criteria, and tools. *International Journal of Entrepreneurial Venturing*, 10(2), 256-286.

Hope, A. (2018) Sustainability business model design: A review of tools for developing responsible business models. In L. Moratis, F. Melissen, & S. O. Idowu (Eds.), *Sustainable Business Models. CSR, Sustainability, Ethics & Governance* (pp. 377-394). Springer.

# III Understanding and Navigating Patterns

<sup>1</sup>For example, Timmers, P. (1998). Business models for electronic markets. *Electronic Markets*, 8(2), 3-8.

Panchal, D., & Krishnamoorthy, B. (2020). Emerging perspectives on business model typologies. *International Journal of Business Excellence*, 21(3), 410-428.

<sup>2</sup>Alexander, C., Ishikawa, S., Silverstein, M., Jacobson, M., Fiksdahl-King, I., & Angel, S. (1977). *A Pattern Language: Towns, Buildings, Construction*. Oxford University Press, p. x.

<sup>3</sup>For more background information about the definition of pattern for sustainable business model design and our approach to using the Alexandrian form to describe patterns, see Lüdeke-Freund, F., Carroux, S., Joyce, A., Massa, L., & Breuer, H. (2018). The sustainable business model pattern taxonomy - 45 patterns to support sustainability-oriented business model innovation. *Sustainable Production and Consumption*, 15, 145-162.

<sup>4</sup>Leitner, H. (2015). *Pattern Theory: Introduction and Perspectives on the Tracks of Christopher Alexander*. HLS.

<sup>5</sup>Alexander et al., 1977, p. 747.

<sup>6</sup>For a system that integrates different pattern types, see Remane, G., Hanelt, A., Tesch, J., & Kolbe, L. M. (2017). The business model pattern database – A tool for systematic business model innovation. *International Journal of Innovation Management*, 21(1), Art. No. 1750004. These authors distinguish between 'prototypical patterns' and 'solution patterns'.

See also Abdelkafi, N., Makhotin, S., & Posselt, T. (2013). Business model innovations for electric mobility - What can be learned from existing business model patterns? *International Journal of Innovation Management*, 17(1), Art. No. 1340003.

<sup>7</sup>The 11 Pattern Groups were identified using an intensive review of academic and practitioner publications as well as a Delphi study with ten international experts. A detailed description of the Delphi review and classification method can be found in Lüdeke-Freund et al., 2018, and in Carroux, S. (2017). *Patterns for Sustainable Business Model Innovation - Creating a Pattern Taxonomy for Business Model Innovation*

*in the Sustainability Context*. Master thesis. University of Hamburg.

<sup>8</sup>The original framework, the 'integrative sustainability triangle', builds on the principles of a Gibbs composition triangle and was introduced in Kleine, A., & von Hauff, M. (2009). Sustainability-driven implementation of corporate social responsibility: Application of the integrative sustainability triangle. *Journal of Business Ethics*, 85, 517-533.

<sup>9</sup>The associated value creation potential of each pattern was assessed with the help of ten international experts. They were asked to associate the 45 patterns and the 11 groups to the ecological, social, and economic value creation effects they expected. A detailed description of the assessment and visualisation methodology used to generate the Pattern Triangle can be found in Lüdeke-Freund et al., 2018.

<sup>10</sup>Mehta, P., & Shenoy, S. (2011). *Infinite Vision: How Aravind Became the World's Greatest Business Case for Compassion*. Berrett-Koehler Publishers.

<sup>11</sup>As of now, there is only one pattern in group 10. But this will most likely change as new patterns evolve over time.

<sup>12</sup>As of now, there is only one pattern in group 11. But this will most likely change as new patterns evolve over time.

<sup>13</sup>Alexander, C. (1979). *The Timeless Way of Building*. Oxford University Press. Alexander et al., 1977.

<sup>14</sup>Alexander et al., 1977, p. xiii.

<sup>15</sup>Gassmann, O., Frankenberger, K., & Choudury, M. (2020). *The Business Model Navigator. The Strategies Behind the Most Successful Companies* (2nd ed.). FT Publishing. Remane et al., 2017.

<sup>16</sup>Hahn, T., Figge, F., Pinkse, J., & Preuss, L. (2018). A paradox perspective on corporate sustainability: Descriptive, instrumental, and normative aspects. *Journal of Business Ethics*, 148(2), 235-248.

# IV 45 Patterns

## Pattern 1: Differential Pricing

<sup>1</sup>World Health Organization, & World Bank (2015, June 12). *New Report Shows that 400 Million Do Not Have Access to Essential Health Services*. World Health Organization. Retrieved from <https://www.who.int/media-centre/news/releases/2015/uhc-report/en/>.

<sup>2</sup>Pattern originally found in Clinton, L., & Whisnant, R. (2014). *Model Behavior: 20 Business Model Innovations for Sustainability*. SustainAbility.

<sup>3</sup>Mandal, A. (2019, February 26). *Disparities in Access to Health Care*. News-Medical. Retrieved from <https://www.news-medical.net/health/Disparities-in-Access-to-Health-Care.aspx>.

## Pattern 2: Social Freemium

<sup>1</sup>Marmamula, S., Keeffe, J. E., Raman, U., & Rao, G. N. (2011). Population-based cross-sectional study of barriers to utilisation of refraction services in South India: Rapid Assessment of Refractive Errors (RARE) Study. *BMJ Open*, 1(1). Retrieved from <http://dx.doi.org/10.1136/bmjopen-2011-000172>.

<sup>2</sup>Pattern originally found as 'Freemium' in Clinton, L., & Whisnant, R. (2014). *Model Behavior: 20 Business Model Innovations for Sustainability*. SustainAbility.

<sup>3</sup>Marmamula et al., 2011.

<sup>4</sup>Aravind Eye Care System. (2019, June 6). *Our Story*. Aravind Eye Care System. Retrieved from <https://aravind.org>.

<sup>5</sup>Täuscher, K., & Abdelkafi, N. (2018). Scalability and robustness of business models for sustainability: A simulation experiment. *Journal of Cleaner Production*, 170, 654-664.

## Pattern 3: Customer Financing

<sup>1</sup>Belz, F.-M., & Peattie, K. (2013). *Sustainability Marketing: A Global Perspective* (2nd ed.). Wiley.

<sup>2</sup>Pattern originally found as 'Innovative Product Financing' in Clinton, L., & Whisnant, R. (2014). *Model Behavior: 20 Business Model Innovations for Sustainability*. SustainAbility.

<sup>3</sup>Simpa. (2020, January 31). *About Us*. Simpa Energy. Retrieved from <https://www.simpaenergy.in>.

<sup>4</sup>Overholm, H. (2015). Collectively created opportunities in emerging ecosystems: The case of solar service ventures. *Technovation*, 39, 14-25. Bohnsack, R., Pinkse, J., & Kolk, A. (2014). Business models for sustainable technologies: Exploring business model evolution in the case of electric vehicles. *Research Policy*, 43(2), 284-300.

<sup>5</sup>DeBord, M. (2016, August 5). *The Simple Truth Behind the SolarCity Business Model Tesla Wants to Pay \$2.6 Billion for*. Business Insider. Retrieved from <https://www.businessinsider.com/how-solarcitys-business-works-2016-8>.

## Pattern 4: Subscription

<sup>1</sup>The Strategic CFO. (2019, May 22). *Inconsistent Revenue Streams*. Retrieved from <https://strategiccfo.com/inconsistent-revenue-streams/>.

<sup>2</sup>Pattern originally found as 'Subscription Model' in Clinton, L., & Whisnant, R. (2014). *Model Behavior: 20 Business Model Innovations for Sustainability*. SustainAbility.

<sup>3</sup>The Goodness Project. (2021, June 8). *The Best Vegan, Natural, Gluten-free Products and Gifts Delivered*. Retrieved from <https://thegoodnessproject.co.uk>.

<sup>4</sup>Chen, T., Fenyo, K., Yang, S., & Zhang, J. (2018, February 9). *Thinking Inside the Subscription Box: New Research on E-commerce Consumers*. McKinsey & Company. Retrieved from <https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/thinking-inside-the-subscription-box-new-research-on-ecommerce-consumers>.

<sup>5</sup>Adobe. (2021, June 3). *Helping Our Customers*

*Support Sustainability*. Retrieved from <https://www.adobe.com/bg/corporate-responsibility/sustainability/product-innovation.html>.

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ISBN 978-3-9824003-0-3



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