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A New Method for Developing a Sustainable  
Value Proposition

by

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# Design-Driven Innovation for Sustainability: A New Method for Developing a Sustainable Value Proposition

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## ABSTRACT

This paper offers two starting points bridged by a question: The first point is the field of sustainability concepts that can help transform a resource-wasting society into a sustainable one. The second point is the field of design-driven innovation that can generate sustainable economic success by designing products and services that meet people's needs. A question bridges these two starting points: How do we design sustainable products to make them more successful? This essay introduces a tool to help companies develop innovative products and services that are sustainable for the environment, the economy and society: the Sustainable Value Proposition Tool (SVPT).

## 1. CHALLENGE # 1: GREEN PRODUCTS STILL FACE ECONOMIC CHALLENGES

“Green products” still do not appear to be particularly successful in the marketplace. A study by the European Union revealed that the green industry's share in Germany of gross domestic product (GDP) dropped from 3% (2004) to 2% (2008). The share of the green industry in the US rose from only 1 to 2 percent in 2010 [1]. In its Cleantech Report 2011, the Swiss Ministry of Economy (SECO), estimated cleantech's share of the GDP at 3.5% [2].

What might be the reasons? While there might be multiple causes leading to this result, one key factor is that it is not enough for green products to differentiate themselves on the market simply by being declared as green, while creating no additional customer benefits, or even while being user-unfriendly. One example of this comes from a friend of the author, who wanted to purchase a state-of-the-art, energy-efficient apartment but in the end decided not to, saying: “The apartment may well be the latest state of the art, but they didn't understand how to build a usable kitchen.”

In addition, the understanding of eco-friendly products is undergoing a change. Holistic concepts and approaches of sustainability are moving into the foreground in the discussion about designing a sustainable human society. These approaches no longer have just the ecological efficiency of individual products in mind, but instead do thorough justice to all three pillars of sustainability — the environment, society, and the economy — and are also known as triple bottom line approaches.

Sometimes green products did not go far enough to make a noticeable difference to customers. For many years, product design was characterized by thinking in terms of efficiency, with a focus on products that consume fewer resources or that do less harm. These efficiency efforts are being met with increasing criticism. In September 2011, Prof. Em Daniel Spreng, from the Swiss Institute of Technology (ETH) in Zurich, startled the audience at a podium dialogue at the national Blue-Tech Conference in Winterthur, Switzerland: “The concept of efficiency is a lie. It has only led to even more consumption, and an incessant increase in emissions.”

The German chemist Michael Braungart puts it this way: “We don't have to do things correctly, but we must rather do the correct things.” By this he means that eco-efficiency only delays, but does not avoid, the exploitation of resources. Braungart and his colleague William McDonough claim the goal of sustainable action goes past eco-efficiency to “eco-effectiveness” [3]. Eco-effective products do not simply minimize harm. They deliver economic success while being *completely* ecologically safe, and while contributing to diversity in nature and society, to secure both the continued existence of our planet and its productivity, and in turn the basics of human life.



Thus, many green products did not provide enough value to customers — value far beyond that of traditional products — to ensure their success in a competitive marketplace.

## 2. CHALLENGE #2: WELL-DESIGNED PRODUCTS TOO OFTEN LACK SUSTAINABILITY

How can sustainable products and services find more customers? Design, design management and design-driven innovation offer instruments that increase the success of market launches because they are based on customer acceptance. By observing customers and recording requirements that are not satisfied or that must continually be satisfied, the design process promotes solutions that achieve sustainable economic success. In its study *“The Effectiveness of Design”* the Association of Dutch Designers concludes that the use of design in the development process for new products increases their financial performance by 20% [4]. In its study *“The Economic Effects of Design”* the Danish “National Agency for Enterprise and Housing” determined that companies investing in design show 22% more growth than their competitors who do not invest in design [5].

However, many human-centered design instruments primarily – and sometimes exclusively – aim at satisfying customer needs and in turn achieving financial success, leaving out other dimensions of sustainability. One example: Hewlett-Packard representatives introduced their “Design Value Matrix” at the May 2011 conference of the Design Management Institute in Amsterdam. The matrix has the goal of ensuring customers are provided with particularly high quality solutions. The presented matrix draft provided for four central strategic activities; one of these was “design to sustain” (presenting the unique idea of introducing “recyclable materials”) [6]. This sustainability activity was removed in the final version of the matrix, also presented in Amsterdam. In the end, only the well known “design to innovate,” “design to differentiate,” and “design to simplify” activities were kept.

The subject of sustainability has actually been present for a long time in discourse on the purpose of design. Authors such as Papanek in the 1970s were already writing about social design, and the responsibility of the designer to society and the environment. In current publications, authors such as McBride are calling for a triple bottom line approach to design [7], to design simultaneously for the financial, environmental, and social bottom lines: “To be sustainable, organizations now need to be triple bottom line by design.... They need to prosper not only by serving markets but also by serving life.” Nathan Shedroff offers a comprehensive overview of sustainable design in *Design is the Problem*: “Successful design is careful and considered. It responds to customers/users/participants/people, market, company, brand, environment, channel, culture, materials, and context. The most successful design is inseparable from these criteria. The most meaningful design is culturally and personally relevant, and we respond to it on the deepest levels. The best design also has a future. It is sustainable.” [8] Press and Cooper write in 2003 [9]: “The challenge for the designer is to gain the specialised knowledge necessary to design the sustainable experience of the future.”

## 3. INTEGRATING SUSTAINABILITY AND DESIGN THINKING — SUSTAINABLE DESIGN MANAGEMENT

These two challenges can both be simultaneously addressed by supplementing design management with concepts and tools that promote sustainability in the product development and innovation process – and in the end, in the “thinking” of the organization. The goal of this approach is to tie the discipline of eco-effective production to the discipline of design-driven innovation, to create a sustainable design management process.

To support this goal, a powerful innovation tool is offered to support companies and organizations in aligning their product strategies and innovation activities with achieving the triple bottom line; a tool that in fact demands that this be achieved: the Sustainable Value Proposition Tool (SVPT).

## 4. VALUE PROPOSITIONS AND DESIGN MANAGEMENT

A value proposition describes how value is created for customers and clarifies the kind of value that is delivered through products and services. The SVPT tool for creating a *sustainable* value proposition is based on four existing and well-proven templates. Their common feature, with one exception, is that they define the value proposition as the totality of the activities within a company required to provide a service or a product of value to the customer. The value proposition concept is therefore based on the rigorous assumption that all company activities must bring about customer benefits. The actual purpose of the company is to bring effective value propositions to the market. To achieve this, design management acts on three decision-making levels [10]: “operational level of the project,” “creation of a design function in the company,” and “the strategic level, or the ability of design to unite and transform the company’s vision.”

Design management often makes use of a relative understanding of value: Value is whatever the customer feels is valuable. The American designer Darrel Rhea describes these levels of value [11]: Price, function, emotion, status, and meaning. The higher the level of value, the more distinct the design activity must be that creates it (see Figure 1). The SVPT instrument helps to differentiate and design the value that a product or a service should deliver to the customer.

The value of price for instance is the value with the least amount of differentiation and requires relatively little design. But competition at this level is the highest. Meaning on the other side has the highest value and is the most difficult to design. In this case, the customer is no longer buying a product or a service, but rather meaning. There is less competition on this level and there is a strong relationship between customer and product/service: “We envision a time when customers increasingly make their purchasing decisions based on deeply valued meanings that companies evoke for them through their products and services – in other words, meaningful consumption. . .” [12].

## Levels of Value

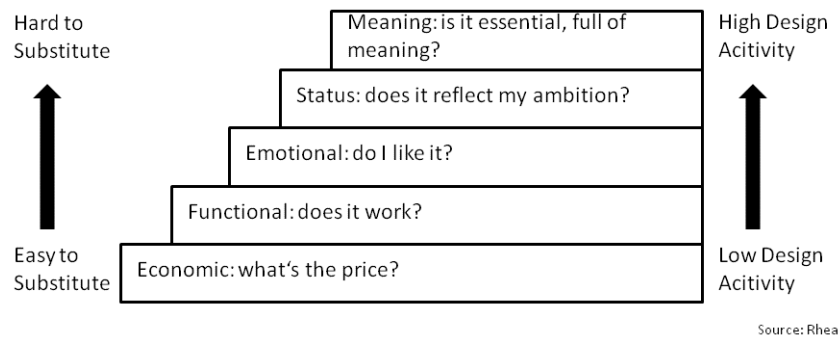


Figure 1. Levels of Value

The value proposition instrument must achieve the following: to define how value is created and to enable “meaningful consumption.” The value proposition thus becomes the driver of the design process, or all design activities within a company. It forms the basis for organizing all relevant services for the market that are implemented by design management.

### 4.1. Four Value Proposition Templates and One Template for Sustainable Product Management

Four design-driven templates and one sustainability-driven template are presented here in condensed form.

#### 4.1.1. NABC

The NABC template consists of four questions:

1. What is the important customer and market Need?
2. What is the unique Approach for addressing this need?
3. What are the specific Benefits per costs that result from this approach?
4. How are these benefits per costs superior to those of the Competition and the alternatives?

The California-based R&D organization SRI International rigorously applies this template in all its innovation projects and achieves outstanding results with it time and again. CEO Curtis R. Carlson and William W. Wilmot published NABC in 2006 [13].

#### 4.1.2. Value Proposition Builder

Barnes et al. developed the Value Proposition Builder™ model [14]. This model is made up of six elements:

1. Market: understanding the specific group of customers you want to target
2. Value experience: defining and understanding precisely what it is your customers value
3. Offerings: mapping, defining, categorizing and managing the life cycle of your offerings around value
4. Benefits: taking the external and internal views of your value experience and prioritizing them, including the cost component (price and customer risk)
5. Alternatives and differentiation: what the alternatives are to using your organization, and how and why you are different (and better) from those alternatives.
6. Proof: benefits realization techniques, evidence of your ability to deliver the customer's desired value experience.

The ten-point template also adds four questions to these six elements: Over what time frame will the proposition be delivered to the customer? How will the value proposition be communicated internally and externally? How will the value proposition be operationalized throughout the business?

#### **4.1.3. CO-STAR**

CO-STAR groups the value proposition into six different subject areas. The template was developed by the Enterprise Development Group, based in California [15]:

1. Customer: Who are the target customers; what are their needs and interests?
2. Opportunity: What are the unique and most significant technical and market opportunities?
3. Solution: What is the suggested solution that meets customer needs and takes advantage of opportunities?
4. Team: What talent needs to be on the team to ensure the best solution?
5. Advantage: What competitive alternatives exist and what is the advantage the proposed solution has over these alternatives?
6. Result: What results can be expected from the solution, e.g. returns to the company and rewards to the customer?

#### **4.1.4. Business Model Canvas**

The term "value proposition" is used in a more narrow sense in Osterwalder/Pigneur's Business Model Canvas [16]. They use the term to mean the actual product, specified as "solution," "approach" or "offering" by other templates. Still, the model provides valuable information that is worth considering in a wider value proposition definition. The Business Model Canvas is made up of nine "building blocks:" Key activities, key partners, key resources, cost structure, customer relationship, customer segments, channels, revenue streams and value propositions. The goal of the authors is to explore these diverse subject areas to create new and unexpected business models.

#### **4.1.5. Templates for Sustainable Product Development**

In addition to these four approaches characterized by design thinking, there are "Templates for Sustainable Product Development" published by Ny, et al. in 2008 [17]. These templates attempt to tie the sustainability approach to demands of product development. This method shapes three different templates: market desires/needs, product concepts, and extended enterprise (societal stakeholders). This approach ensures that the actual product solution takes a step in the right direction, i.e. that products are developed that satisfy future market needs of sustainability. A great many of the questions this approach brings up are directly usable in our model for a sustainable value proposition, primarily in the subject areas of market, solution and stakeholders.

#### **4.2. Proposal For a Basic Model**

While all of these models encounter high acceptance in practice, CO-STAR will be used, whose elements appear in all other templates, as a starting point for further remarks. On the basis of the observation of the author, CO-STAR provides an especially successful balance between generic and detailed question formulations. Several of the elements appear in other templates as well, and can be customized to clarify value for sustainability:

- Market need: Does a market need exist for a sustainable value proposition?

- Value Experience: How does the customer experience differ from alternative offerings?
- Channels and key resources: How can these be designed and used in a sustainable manner? What effect do they have on the product life cycle?
- How can the “extended enterprise” collaborate to contribute to sustainability?
- Proof: How can we verify that the value proposition is sustainable?

## 5. BACKGROUND THEORY OF SUSTAINABILITY

Sustainability has been an interdisciplinary subject since the Brundtland report in 1987. One immediate result of this report was the development of the The Natural Step framework presented below. The report is also the basis for the 3-pillar model for sustainability which appears, for example, in the requirement of pursuing a triple bottom line approach cited above. The 3-pillar model is based on the UN resolution adopted at the World Summit 2005 [18]: “These efforts will also promote the integration of the three components of sustainable development – economic development, social development, and environmental protection – as interdependent and mutually reinforcing pillars.”

Holistic concepts and approaches of sustainability are moving into the foreground in the discussion about designing a sustainable human society. These approaches no longer have just the ecological efficiency of individual products in mind, but instead do thorough justice to all three pillars of sustainability, and are known as triple bottom line approaches.

Cradle to Cradle® and the framework of The Natural Step are presented below. Other examples of triple bottom line approaches include “The Story of Broke,” a cartoon movie in which Annie Leonard and her team examine the interrelations among ecology, the economy, the government and taxes [19]. Gunter Pauli uses the Blue Economy approach, based on the Zero Emissions method, to describe how new growth is possible as a result of adhering to principles of nature [20]. The “Capital Stock Model,” developed at the Zurich University of Applied Sciences, starts from the World Bank’s sustainability process (1997) and goes on to describe sustainability as a process which must maintain and build up four capital stocks: natural capital, real capital, human capital and social capital [21]. The SEER (Socially, Environmentally, and Ethically Responsible) business model taught at Pepperdine University integrates “Financial Strength, Quality Product/Service, Environmental Stewardship and Corporate Social Responsibility” [22].

Most of these concepts for sustainable development propagate thinking in cycles. This thinking is derived from observing nature and leads to the paradigm “Waste becomes food,” that also appears in the Cradle to Cradle® approach explained below. In this approach, the waste from one product or service becomes input or nutrients for others. Cyclical thinking also shapes the various forms of life cycle assessment and in turn the different stations of the product life cycle. In the SVPT, we apply the definition of the life cycle stages used by the Sustainability Life Cycle Assessment, [23] but we re-define the last “end of life” stage as “re-use:” Raw materials, production, packaging/distribution, use/service, re-use.

### 5.1 The Natural Step Framework

The Natural Step (TNS) is a globally operating organisation with its origins in Sweden. It provides educational service and consultancy in strategic sustainable development. The foundations of the framework for sustainable development were developed 1989 in an iterative process led by Karl-Henrik Robért who involved some dozens of scientists [24]. The development of the scientific base of the framework still goes on.

The TNS approach outlines five levels at which sustainable development occurs (see Figure 2):

Level 1: The planet and its processes.

Level 2: Principles, the adherence to which will ensure the continued existence of life on the planet.

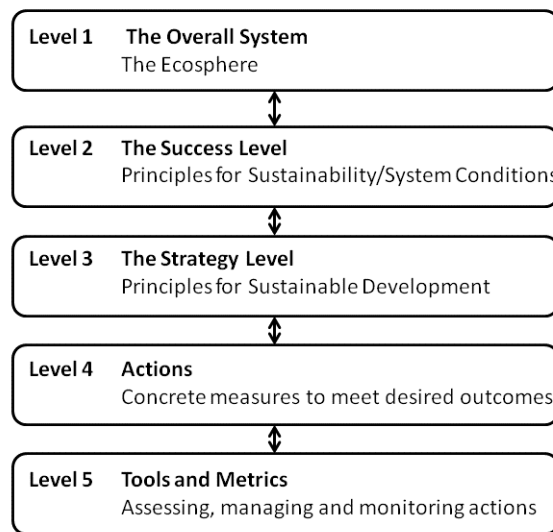
Level 3: Strategies supporting adherence to the principles.

Level 4: Actions (products, services, strategies, other measures) that adhere to the principles.

Level 5: Tools and measuring instruments for guaranteeing adherence to the principles.

The SVPT is a tool, guaranteeing that products, services and strategies are designed according to sustainability principles. Using the SVPT has impact on all the levels of sustainable development.

## 5 Levels of Sustainable Development



Source: The Natural Step

Figure 2. Five Levels of Sustainable Development

TNS has developed the following normative science-based principles from one systematic, full-systems perspective, that guarantee the continued existence of life on the planet: "To become a sustainable society we must:

1. Eliminate our contribution to the progressive buildup of substances extracted from the Earth's crust. (Comment: Society shouldn't bring up substances that were naturally underground more quickly than natural processes can put them back underground. This endangers life in the narrow band of the biosphere because the chemical composition changes dramatically and nature can't cope with that change).
2. Eliminate our contribution to the progressive buildup of synthetic chemicals and compounds produced by society (e.g., dioxins, PCBs, and DDT. *Comment: These materials are persistent and it takes a very long period of time for nature to de-compose them. The systematic buildup again dramatically changes the chemical composition of the biosphere.*)
3. Eliminate our contribution to the progressive physical degradation and destruction of nature and natural processes (*Comment: Actions such as overharvesting forests, paving over critical wildlife habitat, moving species from one ecosystem to another, or decreasing the amount of fertile soil by erosion reduce the capacity of nature to deliver its eco-services such as photosynthesis, reintegration of substances into the cycles of nature, or stabilising the natural cycles.*)
4. Eliminate our contribution to conditions that undermine people's capacity to meet their basic human needs (e.g., unsafe working conditions or not enough pay to live on. *Comment: If people cannot meet their basic human needs, they are not likely to follow the first three principles.*)

The compliance with these principles is what sustainability means in the TNS framework. There is an extensive set of methods that supports companies, municipalities and other social systems in applying these principles. One method, important for our approach, is that of strategic prioritization of questions used in the development of measures (strategies, products and services):

- Is the action moving you toward or away from your sustainability vision (which makes sure that the sustainability principles will be observed)?
- Does the action/investment provide a stepping stone for future moves or does it lead to a dead end?
- Will this action offer an adequate return on investment?



Both TNS as well as Cradle to Cradle® consider dematerialization and substitution the primary challenges in product development. Dematerialization can be used as a measure for technological efficiency, so fewer raw materials are consumed in the production process. In addition, resource gains can be achieved through process optimization. Substitution means the replacement of substances that are scarce or ecologically hazardous with ones that are safe.

### 5.2 Cradle to Cradle®

The architect William McDonough and chemist Michael Braungart published their approach in 2002 in their book *Cradle to Cradle: Remaking the Way We Make Things*. Their understanding of sustainability is based on a three-part paradigm:

- Waste equals food
- Usage of renewable energy
- Active support of diversity

This paradigm can be adhered to by means of a cyclical strategy – based on the cycles of nature. Cradle to Cradle® requires that products be designed in either a biological or technical cycle (the authors use the term metabolism for this process). Biological means that the substances used for production are biodegradable, that the biological nutrients go back to nature, into the “biological cycle.” Technical means that the substances used for production are human inventions and should ideally be upcyclable and at least recyclable into the technical cycle. The authors describe present-day recycling as downcycling, and therefore a process of loss. If a product mixes biological and technical cycles it’s no longer considered sustainable and safe.

### 5.3 Human Scale Development – Development According to Human Dimensions

The Chilean economist Manfred Max-Neef defines sustainability entirely from the viewpoint of human needs. Human Scale Development [25] means that economic-societal activities should aim at satisfying basic needs. He distinguishes between needs and satisfiers. Max-Neef came to an understanding of needs and need satisfaction, based on poverty research, which led him to the “threshold hypothesis” [26]: “For every society there seems to be a period in which economic growth brings about an improvement in the quality of life, but only up to a point – the threshold point – beyond which, if there is more economic growth, quality of life may begin to deteriorate.” Max-Neef defines nine basic needs based on axiological categories. They must all be satisfied simultaneously, so far as possible. He describes needs in a system of mutual dependence, and not in a hierarchy: subsistence, protection, affection, understanding, participation, leisure, creation, identity and freedom. And he defines four needs based on existential categories: being, having, doing, interacting.

Problems with satisfiers can then arise if they pseudo-satisfy (the exploitation of natural resources leads to the withdrawal of our basis for existence) or if they block other needs from being satisfied (obsessive economic competition blocks security, devotion, participation and idleness).

## 6. ESSENTIAL GUIDELINES FOR A SUSTAINABLE VALUE PROPOSITION TOOL (SVPT)

Each of the three sustainability approaches described above complement each other. The TNS framework provides the basis for understanding strategic sustainable development. It creates order and incorporates a strong social aspect in the definition of the sustainability principles. In addition, sustainability is set in correlation with economic success in the strategic question instrument. With its two-cycle model (separating the biological and technical cycles), Cradle to Cradle® provides the basis for sustainable management of the product life cycle. Human Scale Development draws one’s attention to the fact that design management must consider not only the needs of customers, but also the needs of all participants in the product development process. The following principles, from the theoretical sustainability background discussed above, offer essential guidelines for creating a value proposition:

- A normative, science-based understanding of sustainability must be ascribed to the value proposition.
- The design process, and therefore the value proposition, must be considered in cyclical terms: For example, a product must be designed so that it can be easily taken apart and supplied to the recycling process.



- The value proposition tool must call for options for dematerialization and substitution via safer materials.
- As a result, sustainable satisfaction of customer needs is only a given if it does not block other needs from being satisfied.
- The design process must be viewed as stakeholder management: All stakeholders must commit to sustainability principles, and all stakeholders must make it possible for basic needs to be satisfied.

## 7. THE SUSTAINABLE VALUE PROPOSITION TOOL (SVPT)

The tool comprises three modules, as shown in Figure 3:

1. Design principles of the sustainable value proposition
2. Awareness module
3. Checklist

The principles show the goals to be achieved with each value proposition. In addition, they inspire questions to be posed that make designing a sustainable value proposition possible. They are called design principles because the product/service has to be designed to these principles. The awareness module brings an understanding of sustainability and of the goals of sustainable value propositions to all functions/stakeholder groups involved in the creation of a value proposition. It is a module that generates, for process participants, the knowledge necessary to design a sustainable value proposition at all. The checklist is a list of questions that ensures the goals of the project are met and the principles are adhered to.

### Sustainable Value Proposition Tool: 3 Modules And Result

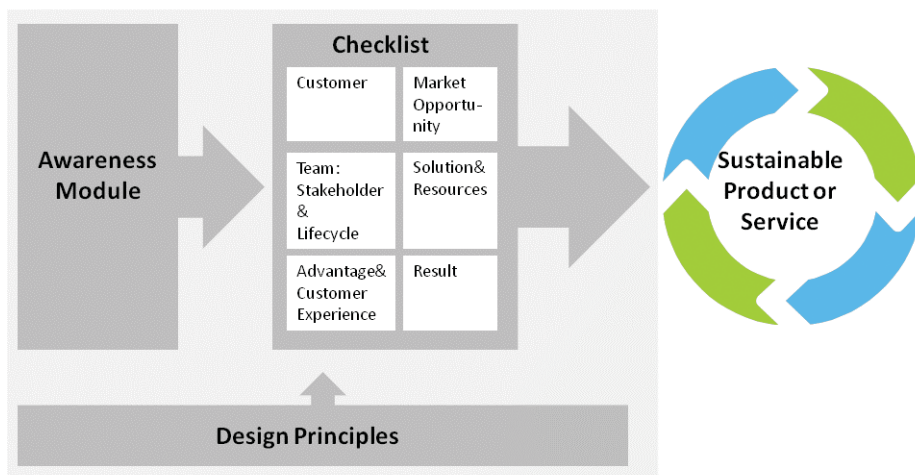


Figure 3. Sustainable Value Proposition Tool

### 7.1 SVPT Module 1: Design Principles

Combining the principles developed by The Natural Step, Cradle to Cradle® and Human Scale Development with the three-pillar concept, the result is three requirements for a sustainable value proposition. These requirements, or formal principles, specify a general framework within which sustainable value propositions can be defined. These requirements are normative and apply for any sustainable value proposition.

- A. The value proposition guarantees that products and services are developed that are in harmony with natural cycles over the entire life cycle.
- B. The value proposition provides the basis for economic success.
- C. The value proposition guarantees that the basic needs of the people involved in the overall life cycle of the product or service are satisfied through the specific solution, or that the satisfaction of these needs is not prevented.

It is scarcely possible today to achieve 100% adherence to these formal principles. Nor is it possible to obtain 100% energy from renewable sources – which must be the case implicitly, on the basis of principle A. For example, the Swiss Bertrand Piccard is at the very beginning of his attempt to operate an airplane using solar energy. It will still be quite a while before a sustainable solution can be used for the entire flight. We are therefore including an application principle with the three design principles: If a value proposition cannot guarantee adherence to the three principles, it must at least guarantee a definite advance in the direction of adherence to those principles, in comparison to the current situation.

### **7.2. SVPT Module 2: Awareness module**

The awareness module consists of the derivation of formal principles and introducing them to participants. It introduces both designers as well as product managers, engineers, and environmental scientists to the “triple bottom line” concept and value proposition tool. Training content exists for each of the three formal principles. This content is only listed here and not covered in greater detail. 1st Principle: understanding the discrepancy between rising consumption and declining resources, the 5-level sustainability model, its scientific principles and resulting consequences for action that is responsible and safe ecologically. 2nd Principle: Design as a strategy for sustainable economic success, the function of design management, the levels of value. 3rd Principle: Understanding Max-Neefe’s needs model, understanding the production cycle, impact on individuals and social systems, understanding how human needs affect the ecology and economy.

### **7.3 SVPT Module 3: Checklist**

As described above, our starting point is the six building components in the CO-STAR template. The list of questions is subdivided into the main questions, and questions for differentiation.

#### **7.3.1 Customer**

Who is the customer, and what are his/her needs? What are his/her needs with respect to sustainability? What might his/her hidden and/or future needs be? Comment: The starting point in our sustainable value proposition is a radical orientation to the needs of the customer. Sustainability must first generate benefits for the customer, who controls the supplier of products and service with his/her decision. In section 7.3.5, we will again take up the objection that the customer sometimes does not recognize the value of sustainability. We assume that the sustainable value proposition also often describes activities that serve to sensitize and inform the customer.

This radical value proposition orientation to customer needs is occasionally criticized as inadequate. What if the customer has a lifestyle with no apparent link to sustainability and “needs” numerous long-haul journeys, a swimming pool, or racing cars? Here is where the concept of Max-Neef comes into play: One must make a distinction between needs and satisfiers. The need remains undisputed, but the designer is responsible for designing valuable satisfiers to enable “meaningful consumption.” The sustainable value proposition is responsible for defining how this satisfier is to be designed in a sustainable manner. In the sports car industry, Tesla has certainly succeeded in bringing a more sustainable version to the market, in terms of the formal principles of SVPT.

#### **7.3.2. Market Opportunity**

What is the market, and what opportunity does it offer? How are existing sustainable solutions communicated within the market? Do supply gaps exist with respect to the three pillars of sustainability? What might the future needs of the market be (are there emerging technical solutions, e.g. hybrid technologies, or unique new materials, or critical social trends of developments)? Comment: The basis for any value proposition is the definition of the market on which the proposition is situated. Naturally, this definition can change over the course of the development process, and new markets can be identified/developed. However, one must first understand the target market, since the customer learned his/her behavior and directed his/her expectations there. The question about communication templates should help to identify any communication potentially decreasing value – communication, for example, that places ecological gain in the foreground without making mention of customer benefits.

### 7.3.3 Solution

**What is the solution that satisfies the customer's needs?** What resources (energy, materials, infrastructure, work) are required to provide the solution? How are the materials kept in a closed circle of production – use – re-use? How does the solution have to be designed so it can be used to easily implement the self-contained cycle? Is it possible to substitute existing materials with safe ones or provide solutions that require fewer materials and simpler provision processes? How is the use of fossil fuels reduced or avoided? Comment: Two aspects are central to finding a solution: 1. A creative idea finding and idea selection process that creates a difference from existing market offerings. 2. The selection of resources for the design, production and operational phases of the solution. The subject of resources is a large part of the product development process. By contrast, organizing the stakeholder relationship and defining the customer experience are of greater importance in the service development process.

### 7.3.4. Team: Stakeholders & Life Cycle

**Who provides which output in order to realize the solution?** What measures are necessary to ensure that the solution is implemented in a sustainable manner over all stages of its life cycle? How will it be ensured that the basic needs of all participants in all aspects of the life cycle of the solution (raw materials, production, packaging/distribution, use/service, re-use) are met, or that the satisfaction of these needs is not prevented? Comment: One must specify in this step who and what services are directly part of the product or service system: Is only the evaluation of supplier materials part of the system, or does the supplier also need to be evaluated as an entire company? Life cycle assessments generally show that the greatest challenges arise in the evaluation of raw material suppliers and in transport logistics. In this case one must decide within the sustainable value proposition whether the entire product cycle should be controlled directly, or whether certain control activities can be carried out by certification agencies.

### 7.3.5 Advantage & Customer Experience

What's the advantage over existing internal or external solutions? How does the Customer Experience stand apart from similar offerings? How does sustainability become part of the customer experience? Comment: Customer experience here is understood to mean the sum total of experiences that the customer has with the enterprise at different contact points that is positively distinct from existing experiences. Customer experience almost always requires an integrated product-service solution. Design management makes this solution universal and turns it into a valuable experience for the customer. The advantage of a solution primarily results from the competitive advantage: In what way is this customer experience superior to other solutions? How is it different? For example, if it is only different in the fact that it is ecologically more valuable than other solutions, one must consider how this advantage can be made to be experienced in the customer experience. The market entry of the specific solution is sometimes also accompanied by activities that sensitize the customer to the topic of sustainability.

### 7.3.6 Result

What will the benefits be for the customer, company, partner, society and the environment when this solution is implemented? To what extent does the project provide a flexible platform for other future projects (or does it lead into a dead end)? What is the return on investment (financial, ecological, societal)? Comment: "Result" gives the designers of a sustainable value proposition the opportunity to verify that they adhered to the three formal principles and to show the benefits for stakeholders. The result has already been implicitly described in the preceding questions. However, it proves useful in practice to take an overall perspective once more and name the specific benefits and concrete (financial) results of the project. The result is often summarized in the form of a story, and thus provides the basis for marketing claims.

## 8. RESPONSIBILITY AND OUTLOOK

The SVPT has different functions with respect to the innovation process and design management: It informs, inspires, structures, and controls. It has a comprehensive effect on the tasks of design and innovation management. Innovation obtains new fields of use: It is for instance needed for the re-use phase. What specific product design is necessary to ensure re-usability of materials in a simple process

Table 1. Overview Checklist of the Sustainable Value Proposition Tool

| <b>Building Component</b>       | <b>Main Question</b>  | <b>Differentiating Questions</b>  |
|---------------------------------|---|---|
| Customer                        | Who is the customer and what are her/his needs?   | What's her/his need in respect to sustainability?<br>What might hidden and/or future needs be?  |
| Market                          | What is the market and what opportunities does it offer?                                      | How are existing sustainable solutions communicated within the market?<br>Do supply gaps exist with respect to the three pillars of sustainability?<br>What might the future needs of the market be (are there emerging technical solutions, e.g. hybrid technologie, or unique new materials, or critical social trends of developments)?  |
| Solution & Resources            | Who provides which output in order to realize the solution?                                   | What resources (energy, materials, infrastructure, human labor) are required to provide this solution?<br>How are the materials kept in a closed circle of production – use – re-use?<br>How does the solution have to be designed so it can be used to easily implement the self-contained cycle?<br>Is it possible to substitute existing materials with safe ones or provide solutions that require fewer materials and simpler provision processes?<br>How is the use of fossil fuels reduced or avoided? |
| Stakeholder & Life Cycle        | What's the advantage over existing internal or external solutions?                            | What measures are necessary to ensure that the solution is implemented in a sustainable manner over all stages of its life cycle?<br>How will it be ensured that the basic needs of all participants in all aspects of the life cycle of the solution (raw materials, production, packaging/distribution, use/service, re-use) are met, or that the satisfaction of these needs is not prevented?   |
| Advantage & Customer Experience | What will be the result and benefit for customer, company, partners, society and environment? | How does the Customer Experience stand apart from similar offerings?<br>How does sustainability become part of the customer experience?   |
| Result                          | What will be the result and benefit for customer, company, partners, society and environment? | To what extent does the project provide a flexible platform for other future projects (or does it lead into a dead end)?<br>What's the return on investment (financial, societal, environmental)?   |



and energy-saving procedures? Immediate and massive cost benefits can be achieved for enterprises in this area.

The SVPT might also trigger transformation in the design of companies and cooperations. For example, system limits are expanded when the supply chain must commit to a specific value proposition. Partners turn into substantial producers of value, and turn into a component of the value proposition. New functions must be created in this understanding of collaboration. For example, an external knowledge trustee could monitor quality, without partners having to divulge business secrets.

Of course a central question in this regard is who owns a sustainable value proposition, and in turn, who is responsible for its implementation. It will often be the company that initiates the use phase and is responsible for the service phase. However, the value proposition concept sees it as each company's duty to design a sustainable value proposition that provides services for customers – regardless of the product life phase in which the service was provided. Ideally this will result in a sequence of value propositions with respect to a product or service. These value propositions must then be arranged and coordinated with one another.

There are still gaps that must be closed to develop the SVPT further. For example, each of the six components of the SVPT requires a validation activity, possibly through the use of specific instruments that both structure and evaluate the development process. This means enterprises need to have the ability to quantitatively assess a value proposition. This in turn enables the ability to make a decision relatively early in the development process about whether the value proposition has market relevance or not. This assessment should be the next component of the emerging SVPT practice.

SVPT is intended to be a tool to support innovations that are sustainable from the outset – in other words, innovations that do not have the deficit of reducing the productivity of the planet and of people. Innovation should ease and enrich human life and ensure the productivity and beauty of the planet. SVPT can provide a tangible and transparent support system that makes design sustain and contributes to its positive impact. Victor Papanek wrote in 1973 [27]: “In an environment that is screwed up visually, physically, and chemically, the best and simplest thing that architects, industrial designers, planners, etc., could do for humanity would be to stop working entirely. In all pollution, designers are implicated at least partially. But in this book [“Design for the Real World”] I take a more affirmative view: It seems to me that we can go beyond not working at all, and work positively. Design can and must become a way in which young people can participate in changing society. As socially and morally involved designers, we must address ourselves to the needs of a world with its back to the wall, while the hands on the clock point perpetually to one minute before twelve.”

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