Start with Sustainability

making sustainability the meta-objective for design

A THESIS DOCUMENT
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Start with Sustainability
making sustainability the meta-objective for design

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in Communication Planning and Information Design
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Introduction

"Start with Sustainability" articulates the need to design products sustainably and provides designers with tools that enable them to do so. My thesis argues that a sustainable design practice is achieved by asking critical questions that anticipate and enable discussion around social and environmental implications of our design decisions. My thesis argues that by asking these questions early in the design process, enables them to largely impact the decisions going forward.

Sustainabilty and Design

DEFINITION OF SUSTAINABILITY "...to make development sustainable—is to ensure that it meets the needs of the present without compromising the ability of future generations to meet their needs" (The Brundtland Report 1987)

Fritjof Capra in his book *The Web of Life* refers to a "crisis of perception" in our understanding of the problems of the world such as global warming, poverty, the extinction of animal and plant species on a massive scale. In short, his argument states that the crisis is a result of mechanistic and reductive ways of thinking which are inadequate for addressing the complex and interconnected problems we face today. The crisis is symptomatic of a failure to see how these different problems are interrelated. The recognition and understanding of these interdependencies will therefore require different approaches to design solutions for them. Capra goes on to articulate the need for a new paradigm that views the problems of the world as an integrated whole rather than a dissociated collection of parts. (Capra 1996)

Design of products exists within the intersections of man-made and natural worlds—we rely on the systems of nature to provide us with the materials to develop products and we employ people to develop and create these products. Designed products are always embedded within social and environmental contexts and

therefore they must be considered as important as economic objectives. Thus, the role of the designer is vital in determining the use of materials, human behavior around products, the features and qualities of the product and in a larger sense—product culture. Designers therefore have tremendous influence in promoting sustainable choices in the way products are made, both from an environmental and social point of view.

In order to make responsible design decisions, designers need to take into consideration the entire life cycle of a product—from inception and the mining of raw materials, through production processes, use and ultimately demise,the place where the product eventually ends up. Designers need to recognize and understand these interdependencies in order to design with them in mind.

The challenges posed by complex problems on design

The design theorist Horst Rittel distinguished between two kinds of problems—'tame' problems and 'wicked' problems. He stated that most research about problem-solving behavior is about 'tame' problems—those that "can be manipulated and controlled". (Rittel 1972). Wicked Problems however are "a class of complex, systemic, and purportedly unsolvable problems composed of seemingly unrelated yet interdependent and interrelated elements, each of which manifest as problems in their own right..." (Irwin 2011)

We tend to treat all problems as "tame," perhaps because tame problems "can be exhaustively formulated" and have a solution that can be tested. (Rittel 1972) This is reinforced by the fact that we often lack an understanding of wicked problem dynamics. However, when "framed within larger contexts that take into consideration social, environmental and economic factors, most tame problems can be considered wicked through their connections to, and interdependencies with, larger more complex problems..." (Irwin 2011)

The challenge posed to designers therefore, is the ability to recognize and understand how the problems they will confront are connected to or embedded within complex wicked problems. The ability to integrate social and environmental factors into the problem overcomes the 'crisis in perception' that Capra refers to and suggests a new approach to framing design problems within broader contexts and conceiving of appropriate and sustainable solutions going forward.

My approach and process

Through the literature reviewed, I sought to gain a better understanding of the territory for my thesis. I identified this territory to be within the areas of design, sustainability and systems thinking. I identified two key ideas, one articulated the "crisis of perception" and the need to stop viewing problems in isolation and start viewing them as systemic, interconnected and interdependent issues. The second key idea was to identify the early problem-framing phase of the design process as a "point of leverage for change."(Meadows 1999)

The participant research last fall (2011) served to then substantiate the hypothesis set forth by the literature review. The research was conducted with five product designers in the Pittsburgh area. Through interviews with them, I learnt that designers do not view their design as connected to larger complex problems and do not usually incorporate social and environmental concerns into the early problem-framing process. I also learnt more about the problem-framing phase of the design process and the form that it takes in different design firms.

By synthesizing the findings frommy research, I deduced that if the point of problem-framing determines the trajectory of the design process, then by providing designers with tools and resources that allow them to visualize the interdependent social and environmental ramifications of their design at this early stage, would enable sustainable outcomes moving forward.

Research

/ Literature Review

Themes explored in my Literature Review

1. DESIGN

Framing Problems in Design

Wicked Problems in Design

2. SUSTAINABILITY AND SYSTEMS THINKING

Living Systems Principles

Leverage Points for Change Within Systems

Triple Bottom Line

Life Cycle Analysis

The literature I reviewed lay largely within the areas of design, sustainability and systems thinking. Within design, I explored literature about the design process and particularly the early phase in the process of problem-framing. I also reviewed literature on complex and wicked problems so that I could understand ways to cope with them and address them through design.

Within sustainability, I explored literature related to living systems principles as a way to guide sustainable outcomes. I also reviewed literature related to systems thinking that articulated the existence of leverage points for change within systems and processes. This was important to identify opportunities for my solution within the larger processes of designers. I also explored concepts such as the Triple Bottom Line and Life Cycle Analysis, as two well-tried and documented ideas within sustainability that exist outside the field of design.

The literature review revealed insights and opportunities to integrate the views of sustainability into the designer's process and led to the formulation of my hypothesis for paticipant research in order to further explore and understand current design practice.

Problem Framing in Design

The design process can be viewed as a "negotiation between problem and solution through the activities of analysis, synthesis and evaluation."(Lawson 1997) Usually, design is an ill-structured task (Simon 1973) to which a solution may not be found until significant effort to understand the 'structure' of the problem has been made.

As articulated by Schon and Rein, problem framing includes the forming of "structures of belief and perception", within which designers can construct a view of the problem and attempt to solve it. (Schon and Rein 1994)

Schon articulates that designers selectively attend to the design environment in order to form the problem situation (framing). This frame therefore constitutes the earliest phase in the design process and impacts the entire design process including research, experimentation and the development of the solution. (Schon 1991) Stumpf and McDonnell argue similarly when they state that the initial phase of the design process, when the designer frames the problem "sets a boundary of attention and select what we treat as 'things' of the situation." (Stumpf and McDonnell 1999)

The early phase in the design process is clearly a critical point when the designer selects what to include and address in the design and as a consequence, what to exclude.

Wicked Problems in design

The term wicked problems was developed by Horst Rittel in the 1960's—in an important publication in 1972 he identified ten properties of wicked problems that differentiated them from tame ones. To summarize, Rittel pointed out that wicked problems have no definite formulation or rules about how to solve them. There is no way to determine when to stop, or how to

determine if it has been solved— there is no ultimate test for the solution. The solutions to wicked problems cannot be right or wrong only for better or for worse. There is no one explanation for the problem but several, that that can be offered. There is no list of admissible operations to tackle wicked problems and no well-formed methods. He states that every wicked problem is essentially unique and successful strategies from one problem cannot be applied to another. (Rittel 1972, 392-96)

These properties of wicked problems, as described by Rittel, allude to complex and systemic problems that we see today in the world. Professor Terry Irwin argues that when problems are "framed within larger contexts that take into consideration social, environmental and economic factors, most tame problems can be considered wicked through their connections to, and interdependencies with, larger more complex problems..." (Irwin, 2011)

To cope with wicked problems Rittel called for a "new generation of design methods." (Rittel 1984) One coping strategy involves the process of integration (Luckey, Schultz 2001). "To be integrative, requires both analysis and synthesis. The task of analysis is to subdivide a complex problem into its elements and to determine the nature of the linkages that give organization to its complexity while the task of synthesis is to understand the problem as a whole".

Living Systems Principles

Living systems principles are the principles that govern natural eco systems. Capra speaks about a few principles of living systems such as networks, flows, patterns, interdependence, diversity, cycles, development and nested systems.

Capra articulates that to apply these principles requires a shift in the way we understand the world—from an understanding of parts, to one that is whole and inclusive of all living systems—or-

ganisms, social systems and eco-systems. He states that to build sustainable communities there is a need to understand the implications of built organizations on living systems and view both as fundamentally connected and interdependent—as compared to ascribing living systems only a "use" value.

Much of these ideas of living systems played a key role in formulating the discipline of systems thinking. Capra goes on to make an important distinction between the approach of classical science and that of systems thinking, while the first analyzes systems in terms of the properties of the parts, "systems thinking reverses the equation by showing that the properties of the parts are not intrinsic but can be understood only within the context of the larger whole." (Capra 1996)

By applying principles of living systems and viewing problems as inclusive of the larger contexts and interdependent living systems, we can progress towards building sustainable communities and practices.

Leverage Points for Change within Systems

Systems theorist, Donella Meadows, in a classic article entitled *Leverage Points: Places to Intervene in a System* refers to "places within complex systems (corporations, living bodies, a city, an ecosystem) where a small shift in one thing can produce big changes in everything" and identifies these points of change to be points of leverage. Meadows states that people who are embedded in a system can intuitively grasp where these points of leverage may be located. (Meadows 1999)

Meadows goes on to provide twelve ways to intervene in a system to create change, in an order of effectiveness. The least effective, yet useful way, is to change constants, parameters and numbers within systems—providing for incremental change. For example, this might include passing a rule that ensures that

employees within a company use less paper. This can be effective in the short term, however it "rarely changes behavior."(Meadows 1999) The most effective ways to create change include changing the mindset of people and fundamental organizations within systems and transcending paradigms.
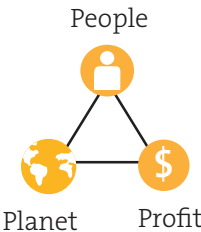
Triple Bottom Line

The Triple Bottom Line, also known as "People, Planet, Profit" captures an expanded spectrum of values and considerations for measuring success through evaluating it not only along the lines of profit, but also the lines of people and planet. (Elkington 1997)

The Triple Bottom Line was devised as a way to incorporate sustainability concerns into corporate accountability. In practice, business considerations appear to center only on economics, with social and ecological benefits considered only as an after thought, rather then given equal weight at the outset.

When applied to the design process, the Triple Bottom Line ideas have the opportunity to "... introduce a new standard of quality, adding ecological intelligence, social justice, and the celebration of creativity to the typical design criteria of cost, performance, and aesthetics. Design driven by these positive aspirations could lay the foundation for a truly inspirational era that can transform industry." (McDonough and Braungart 2002)

The possibilities for innovation within the application of the Triple Bottom Line are numerous. The article by McDonough and Braungart carries a few inspiring examples of the way designers have innovated within this area. One example: while restoring the Ford Motor Company's Rouge River plant in Dearborn, Michigan, designers asked questions such as how can we make the Rouge a place we would allow our children to play? How do we design a manufacturing facility that creates prosperity and health for employees? Rather than using primarily an economic
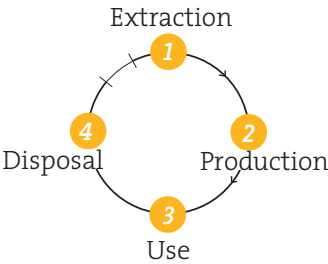
The Triple Bottom Line diagram:

People

Planet   Profit

metrics they viewed the problem through a social metrics. (Mc-Donough and Braungart 2002)

Life Cycle Analysis

The Life Cycle Analysis diagram:

Life Cycle Analysis (Curran 1996) is a tool developed to determine the environmental performance of a product in its entire life cycle. Simply stated, the life cycle of a product embraces all of the activities that go into making, transporting, using and disposing of that product. The typical life cycle consists of a series of stages running from extraction of raw materials, through design and formulation, processing, manufacturing, packaging, distribution, use, re-use, recycling and, ultimately, waste disposal. (European Environmental Agency 2004)

The Life Cycle Analysis was devised as a way to help decision-makers analyze products or processes that results in the most or the least impact on the environment. (Environmental protecttion Agency 2006) It provided several tools and techniques designed to help in environmental management and in the long term, sustainable development.

Key Findings from my literature review

1. UNDERSTANDING THE NATURE OF WICKED PROBLEMS AND RECOGNIZING THAT THEY FORM THE CONTEXT FOR MOST DESIGN PROBLEMS: As pointed out by the "crisis in perception," there is a failure to see how different problems are connected to one another. We therefore need to expand the frames and contexts in which we view problems to those include social and environmental interconnections and interdependencies. On doing this, all problems begin to resemble wicked problems. By analyzing and synthesizing the complexity that these interconnections and interdependencies pose, designers can begin understanding and coping with all the different parts.

2. THE PROBLEM FRAMING PHASE IN THE DESIGN PROCESS AS A POINT OF LEVERAGE FOR CHANGE: Since the phase of problem framing in the design process involves setting the parameters and directions for the trajectory of the design process, this point of framing is an point of power to create big change that greatly influences the final design.

/ Participant Research

Building on the literature review, I started to ask questions such as, do designers frame problems in larger contexts that include interconnections and interdependencies? In what way do they consider social and environmental factors? How do they evaluate success? What does the problem-framing phase look like in the context of a design studio?

To substantiate my learning from the literature review, I conducted field research in the Fall of 2011. The research was conducted with five product designers in the Pittsburgh area. These participants included three industrial and product designers and two entrepreneurs/design thinkers who have founded startups around product ideas. These designers would therefore have the potential to impact the life cycle of the products through their design choices.

I asked participants a set of questions to guide our conversations and discussion. This format allowed participants to reflect upon projects and problems that they have worked on and talk about the issues and complexities that were involved in conceiving of solutions. I met them at their studios, which also allowed me to walk through specific projects that they were currently working on. This was an important part of my research since it served to augment the reflective and retrospective data about past projects from the interviews with immediate problems and present-day thinking. It also allowed me to observe different tools and methods that are used by designers in their processes.
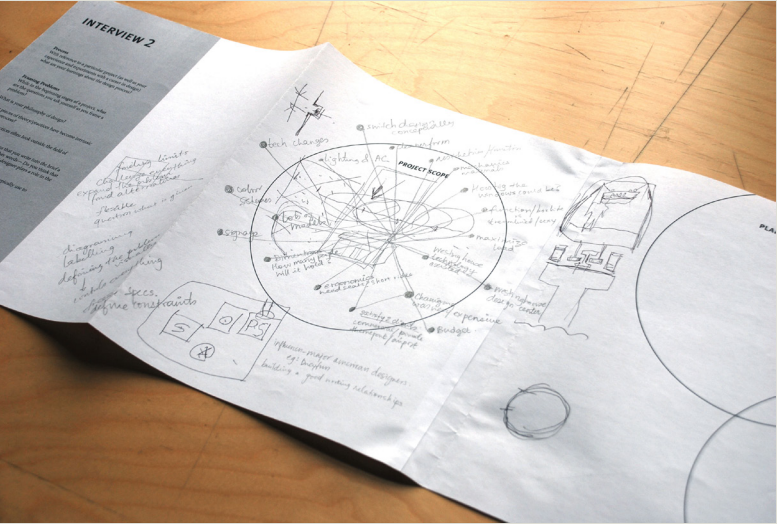
QUESTIONS THAT I ASKED THE PRODUCT DESIGNERS:

What is the process of design at your firm? With reference to a particular project (as well as your experience with a career in design) can you articulate how you went about the design? Which areas were most important?

While in the beginning stages of a project, what are the questions you ask yourself as you frame the project? What do you consider and what would you like to consider?

Do you often look outside the field of design—towards other disciplines through your process?

What are the standards that you typically use to evaluate your design?

How do you consider the people, the planet and profit in your design process? How might you consider the entire chain of people who are involved in the lifecycle of your product? How might you consider the environmental effects through the life cycle of your product?

The Interview Notes: The notes and responses to questions during the interviews were recorded by myself and the participants together on a template.

Synthesizing the data and affinity diagramming

These interviews identified the objectives with which designers frame the contexts of design problems.

How can the designer "ensure the safety of people as they use the product?"

How can the designer "make people happy and delighted" with the design?

How can the designer "motivate people to be environmentally conscious" through the product?

How can the designer "create a fantastic user experience around the product by including a thoughtful design of service?"

When the data from the interviews was clustered within the categories of social and environmental concerns, it revealed a more comprehensive list of larger design objectives—thus, constituting the area of inquiry and the context for the design problem moving forward.

This data supports my assumptions that designers do not consider larger social and environmental interdependencies beyond their customers, clients and users. I also learnt that designers evaluated their final designs by connecting them to the objectives that were defined in the stage of problem-framing.

Key findings from participant research

1. DESIGNERS ARE USUALLY CLIENT AND USER FOCUSED: During the design process participants are focused on client and user requirements. They ask questions about bettering the experiences for users, clarity and ease of use, motivating users to buy products and improving relationships with the client

2. DESIGNERS ARE USUALLY NOT AWARE OF LIFE CYCLE ANALYSIS AND DO NOT INCLUDE IT WITHIN THEIR CONTEXT FOR DESIGN: Participants are sensitive to the context for use of their design, which is only one part of the product life cycle. Sometimes they include the service within which the product lives, including storage, sale and even maintenance after the product is bought.

3. DESIGNERS ARE USUALLY NOT AWARE OF THE TRIPLE BOTTOM LINE: Participants do not usually incorporate social concerns, beyond the client/user, into the design brief. They ask questions concerned with people involved with the use of their designs extensively, as well as questions relating to their clients and their requirements. Participants do consider their choices of material and their efficiency within the environment of use, the larger implications in terms of the social and environmental factors pre- and post-use however, are not considered.

4. DESIGNERS USUALLY FRAME PROBLEMS USING ANALOG PROCESSES: Participants often frame problems in team silos and then discuss and propose to other members of the firm or the client. This may take the form of a meeting around a table with quick drawings. Sometimes, it may involve thinking around a whiteboard with markers and stickies.

other concerns　　　　social concerns　　　　environmental concerns

Affinity Diagram of the insights gathered from the participant research: The data from the interviews was clustered within the categories of social and environmental concerns. This revealed a more comprehensive list of larger design objectives for inquiry.

SOCIAL CONCERNS
Improving and building relationships with the client

Motivating users to purchase the product by exploring concepts such as attractiveness, ease, inspiration, collaboration and sensitivity.

Bettering user experience in terms of accessibility, safety, comfort, delight and use.

OTHER CONCERNS
Efficient use of money

Saving money and making economical choices

Negotiating the budget for the projects

ENVIRONMENTAL CONCERNS
Efficiency in terms of materials and economy.

Ability to balance resources and intent.

Building longetivity into a product as a concept for environmental friendliness.

Start with Sustainability

/ Guiding Principles

Upon synthesizing my findings from the literature review and the participant research, I identified three guiding principles for my design moving forward.

1. DESIGNERS NEED TO BE ASKING DIFFERENT QUESTIONS: Designers need to be asking the additional questions in order to define the context for their design in more sustainable ways. These questions should incorporate social and environmental ramifications that occur through the life cycle of the products that they design.

2. ASK THE QUESTIONS FROM THE START: These questions need to be asked at the beginning of the design process when designers frame problems so that it can determine the trajectory of the process that follows and influence the final design.

2. DESIGNERS NEED TOOLS TO ENABLE THEM TO ASK THESE QUESTIONS: Designers need tools to push them to ask the questions about social and environmental interconnections and interdependencies of their design. These tools need to fit into analog settings since this point in the process, as shown by the research, is usually done in an analog process.

/ The Framework

The Start with Sustainability framework combines two models for sustainability—the Triple Bottom Line and the Life Cycle Analysis. The solution juxtaposes them to reveal more comprehensive concerns about the social, environmental and economic attributes of product life cycles. The solution provides a set of critical questions at the intersections of these models, enabling the designer to better recognize the interdependencies between their design and other complex problems.
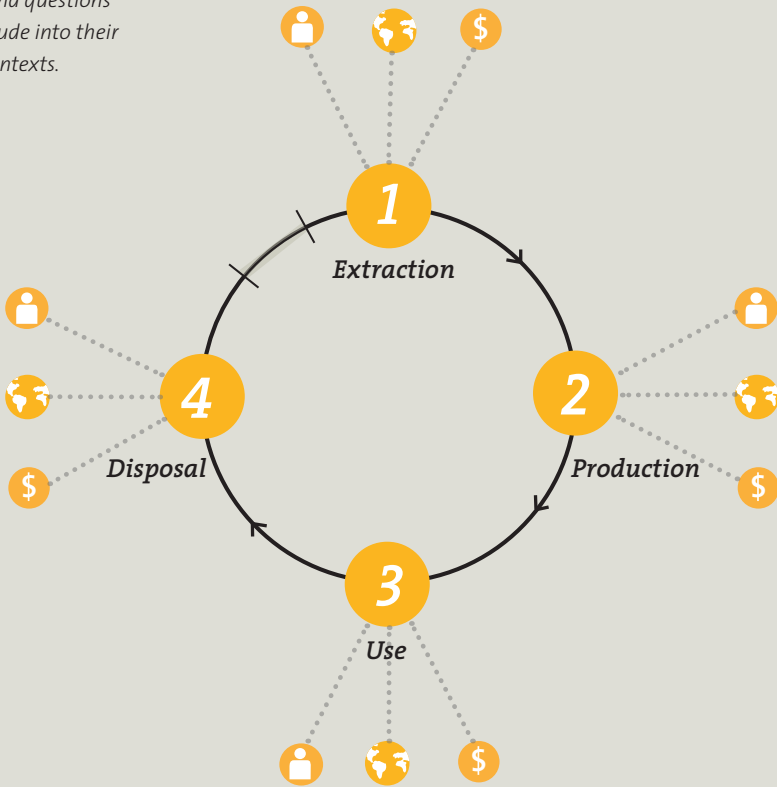
To be able to ask different questions and understand interdependencies, I leveraged the Life Cycle Analysis model. This determines the environmental performance of a product from the extraction of raw materials, production and manufacture, transport, use and eventually disposal and demise. This life cycle provides for one way to view the interconnections and interdependencies of designed products.

To recognize and understand the concerns within the different stages of the products life cycle, I leveraged the Triple Bottom Analysis model. When juxtaposed, the Triple Bottom Line provides for a way to recognize and evaluate concerns about people, planet and profits that arise at the stages in the product life cycle. This prompts designers to ask questions such as: What are the conditions of people when extracting materials? How do production processes affect the planet? Designers then, also have the ability to go a step further and ask, How can I design a product that when used, nurtures the planet?

"Start with Sustainability" provides a set of critical questions that can be asked by designers when defining the frames and contexts of their design problems. This will enable them to include these concerns and address them responsibly in their design.
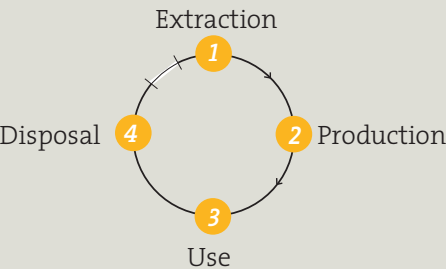
The Start with Sustainability framework diagram:
This diagram combines the Triple Bottom Line and the Life Cycle Analysis. The intersections between these models reveal a range of concerns and questions for designers to include into their problem framing contexts.

The Triple Bottom Line diagram:

People

Planet   Profit

The Life Cycle Analysis diagram:

Extraction

Disposal   Production

Use

*The critical questions asked by
the Start with Sustainability
framework:*

1 *Extraction*

PLANET: What materials are extracted from the earth to make this product? How does the extraction process impact the planet? How does their transport to the site for production impact the planet?

PEOPLE: Who are the people involved in the extraction? Under what conditions do they work?

PROFIT: What are the costs involved in the process of extraction? Are these costs kept low at the expense of the planet and the people?

2 *Production*

PLANET: What production processes are used to make this product? Where is it produced and why choose to make it here? How does the transporting the product for sale affect the planet?

PEOPLE: How does the material used to package the product affect the planet?Who are the people involved in the process of production? Under what conditions do they work?

PROFIT: What are the costs involved in the process of production? Are these costs kept low at the expense of the planet and the people?

3 *Use*

PLANET: What are the different ways in which this product can be used? How do the processes for use affect the planet?

PEOPLE: Who are the people involved in the use of the product? What are the effects of this product and its use on these people? Does it harm them in anyway?

PROFIT: What are the costs involved in the use and maintenance of the product? Are these costs kept low at the expense of the planet and the people?

4 *Disposal*

PLANET: How is this product discarded? Where does it end up eventually? How does it get there? How does this affect the planet?

PEOPLE: Who are the people involved in the process of disposal? Under what conditions do they work?

PROFIT: What are the costs involved in the process of disposal? Are these costs kept low at the expense of the planet and the people?

/ The Prototype

"Start with Sustainability" is an analog studio-based thinking tool that provides a starting point for product designers to ask critical questions regarding the social and environmental concerns that are revealed by juxtaposing the Triple Bottom Line and the Life Cycle Assessment.

DECK OF CARDS: The tool consists of a deck of cards where the front face of each card asks a critical questions related to people, planet and profit with respect to different stages in the product life cycle. The back face of the card provides resources to help designers start discussing the question. By using the cards, designers can begin incorporating sustainable objectives into the design brief and the final solution. It is anticipated that the questions will be difficult to answer and may even be perplexing for some since they are often not asked in the context of design—the website therefore includes further resources and links to tools that would help cope with that.

The deck of cards is intended for use in the early problem-framing phase of the design process when the designer sets the parameters and direction for the problem. The cards complement the genre of resources that live on the designer's desk, like method cards and reference books. Designers can pass the cards around, pin them up, make notes on them, have conversations and ideate around them and fit into existing ways of working in the studio.

WEBSITE: The "Start with Sustainability" concept developed a website in response to user testing for further participation and resources. The website is a participatory way to build a repository of resources that can be customized towards the needs of different disciplines within product design.

front-face

TRIPLE BOTTOM LINE +

LIFE CYCLE ANALYSIS
Using icons to pin-point the section in the juxtaposed sequence

COLOR = LIFE CYCLE STAGE
Relevant color visually places the card within the sequence

CRITICAL QUESTION
Questions relevant to the juxtaposed sequence

NOTES
White space for writing with Dry erase markers on laminated cards

NAME + WEBSITE
Naming / Branding of the cards

CARD NUMBER
Numbering to locate within larger sequence of the LCA

1 PLANET + EXTRACTION

What materials are extracted from the earth to make this product?

NOTES:

Start with Sustainability ①

/ Components Of The Prototype

The Cards

back-face

1 PLANET + EXTRACTION

What are the various materials that make up the product that you are designing/promoting? Try and make a list.
Some materials listed below: For a complete list and more, visit www.startwithsustainability.com

Biomass	Minerals	Metals	Fossil Fuels
Trees and Plants	Bauxite	Aluminium	Coal
Animals	Sulphur	Zinc	Oil
Funghi	Basalt	Lead	Natural Gas
Bacteria	Claystone	Copper	
+ other living	Gypsum	Silver	
materials	Sandstone	Iron	
	Limestone	+ more	
	Diamond		
	+ more		

Global Resource Extraction Projection: 2005–2030
This figure shows a scenario of global extraction of economically used resources up to the year 2030. It is a business-as-usual scenario, i.e. a scenario without any additional policy measures to increase resource efficiency and decrease resource use.

www *www.materialflows.net (online portal for material flow data)*
www.seri.at (Sustainable Europe Research Institute, Vienna, Austria)

GUIDED QUESTIONS
In addition to the primary critical question overleaf

LINK TO RESOURCES
weblink to relevant additional resources online

EXAMPLE IDEAS
Popular example ideas to consider for the larger questions

BIG PICTURE VIEW
Statistics and projections

ADDITIONAL INFO
Relevant links, films, people, books... to consider

view the entire set of Start with Sustainability deck of cards on the next page >

The Start with Sustainability
prototype of the deck of cards:

1 PLANET + EXTRACTION

What materials are extracted from the earth to make this product?

NOTES:

Start with Sustainability ①

1 PLANET + EXTRACTION

How does the process of extracting these materials affect the planet?

NOTES:

Start with Sustainability ②

1 PLANET + EXTRACTION

How does the transport of extracted materials affect the planet?

NOTES:

Start with Sustainability ③

2 PLANET + PRODUCTION

How does the material used to package this product affecting the planet?

NOTES:

Start with Sustainability ⑧

2 PEOPLE + PRODUCTION

Under what conditions do people work to produce this product?

NOTES:

Start with Sustainability ⑩

4 PLANET + DISPOSAL

How is this product discarded?

NOTES:

Start with Sustainability ⑪

1 PEOPLE + EXTRACTION

Under what conditions do people work to extract the materials?

NOTES:

Start with Sustainability ⑤

2 PLANET + PRODUCTION

How do the production processes used to make this product affect the planet?

NOTES:

Start with Sustainability ⑥

2 PLANET + PRODUCTION

Where is the product made and why choose to make it here?

NOTES:

Start with Sustainability ⑦

4 PLANET + DISPOSAL

Where does it end up eventually? How does it get there?

NOTES:

Start with Sustainability ⑫

4 PLANET + DISPOSAL

Who comes into contact with it in this phase of disposal?

NOTES:

Start with Sustainability ⑬

4 PLANET + DISPOSAL

What are the working conditions of these people?

NOTES:

Start with Sustainability ⑭

Register | Log in

Start with Sustainability
making sustainability the meta-objective for design

Join The Community!
Register to connect with other designers, and take part in making sustainable change!

People   Resources   Downloads   About

"How I made IKEA see value in sustainably made furniture.."

▶ *Watch Gill Sans talk about how she embraced sustainable design and then sold it to IKEA!*

Extraction | 125 posts
Production | 35 posts
Disposal | 112 posts

Find resources within your focus: *packaging* ▼

Recent Activity

▶ **Strategic Design Approach to Sustainability**
Talk by Ezio Manzini at the Institute of the Future / June 12 / 4:30pm EST   12

Tamara Melon writes about the future of fashion for Italy
Sustainably grown cotton by farmers in Torino's newest co-op have...   26

⚒ **LCA.ORG announces the lauch of its new app. GaBi 0.6**
"GaBi 0.6 is a revolutionary app for the iPhone that will change the way...   2

⚒ **Data Visualization Tool developed by one of Start with Sustainabilitys own**
"Kinnari's revolutionary design attempts to visualize invisible connections..   13

People

Kinnari Thakker
⌖ Bangalore, India

Terry Irwin
⌖ United States

Dan Boyarski
⌖ United States

Louisa Butler
⌖ United States

Gill Sans
⌖ Rio, Brazil

Roo Gsia
⌖ Hong Kong

RESOURCES
Share and access links, films, conversations, example

STORYTELLING
Stories of use, research and change

PARTICIPATION
Become part of the online community of people who share resources and stories

SCENARIOS OF USE AND CHANGE
Share and view how people are using the cards and changing their designs

CUSTOMIZE CARDS
Share and view how people have customized questions within specializations within product design

DOWNLOAD
Download the deck of cards for use in your studio

/ User Testing

To evaluate the "Start with Sustainability" deck of cards, I used the experience prototyping method that facilitates active participation in the design through "subjective engagement with the prototype" (Martin and Hanington 2012) within a scenario. While doing this, participants were asked to think aloud and verbalize what they are doing and thinking, revealing aspects of the prototype that informed, delighted, confused and frustrated them.

The user tests were planned as one and a half hour sessions with three product designers in their studios. The users were asked to describe a project that they were currently working on. They were then asked to use that as a scenario for the experience prototyping. After the experience prototyping session the users were asked to reflect upon their experience and talk about things that were successful and unsuccessful.

On the whole, users responded positively to the cards. They expressed how they "knew of all these problems and could understand how they connected to product design," however, they articulated the need for more information to supplement each question in order to really begin anwering it. One of the users described how she would ideally like to take all these questions into consideration, however, she did not know how to find information about the conditions of the people who worked in the manufacturing plants and that she imagined that it "is probably proprietary information and is often purposely hidden from the press." Users also articulated issues such as limitations of funds from the clients' side and the general rushed nature of all design projects. One user suggested, "If you framed the concerns within social and economic areas with monetary benefits then it could be something to pitch to the client."

Key findings from user testing

1. RECOGNITION OF INTERDEPENDENT SOCIAL AND ENVIRONMENTAL ISSUES: Users were able to recognize how their designs connected to interdependent social and environmental issues while discussing the critical questions put forth by the cards.

"I would really like to consider these issues, but I just never know where to begin" - User 1

When on the question, *Where does the product end up eventually? And how does it get there?* one of the users spoke about how a few years ago she had the good fortune of working with a client who was interested in considering the "after-life" of products and how they can be repurposed, atleast in part. She articulated how she often wants to include the concepts of repurposing into the design of the product, but that every client, and every project does not allow her to do so.

This goes to prove that designers *do* recognize that their design is interconnected and interdependent on other complex issues if given appropriate tools. It also points out that the need then, is to provide designers with resources and tools that help them think through these issues and work on addressing them in their design.

2. NEED TO CREATE A REPOSITORY OF SUSTAINABILITY REFERENCES: There are several existing tools, frameworks and principles that compile different ways to incorporate sustainability within the questions. Users articulated for a repository of resources on the website to inspire and aid designers in designing responsibly.

3. ADDITIONAL RESOURCES ARE REQUIRED TO BE COLLATED: Users articulated a need for additional resources for the topics that came out of the conversations around the cards. Users articulated the need for an online component to augment the questions and resources that were already within the cards.

4. USERS WANT COMMUNITY SUPPORT AND DISCUSSION: When speaking of potential change that will be made through the process of thinking through the questions, users articulated the need for a space to share and document experiences of use and success stories. They articulated a need for an online community where designers can be inspired by different ways to use the deck of cards.

5. NEED FOR FOCUSSED QUESTIONS THAT ARE RELEVANT TO DIFFERENT DISCIPLINES WITHIN PRODUCT DESIGN: Users found that the questions were often disconnected from their focus areas, and could be customized. For example, a designer who was working on designing graphic belts for his client spoke about how a "version of the cards" that included resources for designers like him, alluding to relevant materials and processes, would have been beneficial to allow him to visualize interconnections.

Next Steps for the Design

The website was conceived after evaluation—therefore, it starts to incorporate the findings into the design decisions. Further steps for the design can be:

1. Users often separated the cards into piles—those questions that are useful for them and those that weren't. The next version of the cards would need to build in the sequence in a manner that does not lead to *excluding* certain questions. The cards function as a set and map all the interdependencies; by excluding some questions the designer is knowingly ignoring a category of interdependencies because they are difficult to begin answering.

2. The website needs to build in a detailed respository of resources and tools that designers can use to understand interdependent problems that are made visible through the cards.

3. The link from cards to website needs to be thought about in another manner. The chance of typing in the URL to view a resources is low.

Conclusion and Reflection

The design of the website and identifying its components was an important next step for the Start for Sustainability deck of cards. The revisions identified by the findings and the suggested next steps emerged directly from the user evaluations. The most important finding was the need for a space where designers can get more information and resources when attempting to understand the complexity of the issues that the questions raise.

The "Start with Sustainability" tools successfully helped users recognize the interdependencies of their designs. Once they acknowledged the connections, users had several questions and concerns about how these complex ideas may be worked into the design contexts. This demonstrated a successful understanding of the questions since the anxiety is symptomatic of wicked problems and the complexity of the issues at hand. The questions that followed this realization were directed towards asking more about how they can address those concerns. For example, users articulated a need for a repository of sustainability ideas to begin thinking about possible approaches that they could integrate. Users articulated the need to find successful strategies for change that others may have used in the past, and a website that begins to collect these stories and challenges for inspiration.

However, my most important observation is that users on recognizing the complexity, asked better questions moving forward. This lead to productive discussions about the conditions of people in factories, the effects of mining metals on the health of workers, the effects of the tar oil industry in Alberta, Canada and the way it affected the lives of people living downstream. This suggested that the designers clearly took a big step in the right direction by opening their minds to the interconnections revealed by these tools.

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