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Linking Green Design and Business Profitability Using the Kano Technique

What is Green Design?

Green design is a term used to describe growing awareness of how businesses effect the environment within the fields of architecture, construction, and interior design. It is also referred to as “sustainable design” or “eco-design”. Green Design supports principles and practices that minimize environmental intrusion such as: choosing energy efficiency wherever possible, working in harmony with the natural features and resources surrounding the project site, using materials that are sustainably grown or recycled rather than new materials from non-renewable resources, reducing waste, both energy and material, and designing buildings to use already existing energy. The list below shows initiative types that business’ can focus on to become more compliant with green design.

- Air & Climate Emissions
- Community Engagement
- Energy Use
- Facilities
- Materials Use
- Preservation/Restoration
- Product Design
- Public Education
- Sustainable Development
- Waste Reduction/Recycling
- Water Use & Emissions

These green design initiatives can help businesses reduce costs, increase efficiency, and capture the environmental market segment. Yet many companies continue to neglect this dimension.

There are two major reasons that many organizations are not implementing green design strategies: insufficient knowledge and ineffective incentives. To motivate environmental improvement within an organization, a connection must be made between environmental design attributes and business strategy/benefits. Without a perceived business benefit, organizations will ignore environmental improvement measures. After performing a brief market segmentation analysis, the Kano Technique can help identify and prioritize green design business strategies (Finster et. al. 2002).

How to Use the Kano Technique

This process can be summarized in the following steps:

- 1) Identify and prioritize customers and stakeholders who voice both environmental and business concerns

- 2) Collect data and translate it into critical environmental product / service attributes
- 3) Use “Kano Technique” to link green design to business strategy
 - a) Design a customer survey
 - b) Analyze customer responses
 - c) Link design approaches to business strategy

The first step in the implementation process is to identify customers and stakeholders who voice environmental concerns. A customer is defined as all people or organizations along the flow of materials who, at any time in the product’s life cycle, receives service, information, products, or by-products of the design. This includes those who don’t pay.

There are two categories of customers that possess environmental information. The first category of customers is called “advocates”. Advocates are customers who “directly and purposefully represent environmental interests” (i.e. the EPA). The second category of customers is called “indirect customers”. These groups exhibit behavior that can support the environment such as, customers at end of a product’s life, who transform product components into something valuable (i.e. those who recycle, remanufacture, disassemble, etc...)

After identifying these customers, the second step is to prioritize them based on measures such as profits, market share, loyalty, and market influence. The company needs to determine which voices to place the most weight upon. When prioritizing, companies must see more than just environmental incentives...they must see business incentives.

While in the process of prioritizing, consider the following three customer classifications:

- 1) “Lead green customers” = those who foreshadow where the market is headed. They are often innovative customers who create the future of a market or industry.
- 2) “High-volume green customers” = customer with strong environmental interests that will consume high volumes of the product being designed
- 3) “Loyal green customers” = customers who will consistently buy a company’s product because of the consideration the company gives the environment

After identifying and prioritizing customers/stakeholders, collect data about environmental concerns. A variety of methods are used to collect data about the environmental needs/desires of customers. These methods include maintaining correspondence with the customer, observation and simulation of product use throughout its life cycle, understanding critical events in the life of the product, and benchmarking competitors.

After establishing the needs and desires of customers, brainstorm product/service design attributes that can meet those needs. This can be facilitated through the use of tables with the following format.

Customer	Environmental needs	Environmental design attributes

After developing a list of possible product attributes, use an adaptation of the “Kano Technique” to clarify customers’ perceptions of product attributes and link business incentives to environmental incentives. The “Kano Technique” is a customer satisfaction tool developed in

the 1980's by Japanese quality expert, Dr. Noriaki Kano. An adaptation of Kano's customer satisfaction model can be used in green design in order to see more specific application.

First, classify customer perceptions of specific product attributes into five categories. Attributes are classified by customers' responses to two questions.

- 1) How do you feel when the attribute is present?
- 2) How do you feel when the attribute is absent?

The five attributes are listed and defined in the table below according to responses to the above questions. There are three possible answers to the questions; satisfied, no feeling, and dissatisfied.

Type of Attribute Perception	When attribute is present?	When attribute is absent?
One-dimensional	Satisfied	Dissatisfied
Must-be	No feeling	Dissatisfied
Attractive	Satisfied	No feeling
Indifferent	No feeling	No feeling
Reverse	Dissatisfied	Satisfied

Each attribute category links to a different set of organizational incentives. Thus, each category suggests a different approach to linking an environmental product attribute to business incentives. This categorization alone cannot be used to rank the overall worth of an attribute because it does not say how much a specific attribute contributes to the value of a product.

Based on the questionnaire data, identify which type of perception the customer has by using the following table.

Q1: If attribute is present?	Q2: If the attribute is not present?				
	1	2	3	4	5
1. I like it.	S	A	A	A	O
2. I expect it to be that way.	R	I	I	I	M
3. I do not feel anything.	R	I	I	I	M
4. There is no other choice.	R	I	I	I	M
5. I do not like it.	R	R	R	R	S

*Key: A = attractive; I = indifferent; O = one-dimensional; R = reverse; M = must-be; S = skeptical

After identifying individual customer perceptions, summarize customer findings by placing the percentage of respondents with analogous responses into each quadrant of the table.

Q2: If the attribute is not present?

Q1: If attribute is present?	1	2	3	4	5
1. I like it.	5%	3%	4%	6%	2%
2. I expect it to be that way.			20%		
3. I do not feel anything.		15%		5%	
4. There is no other choice.			25%		
5. I do not like it.		3%			12%

*Key: A = attractive; I = indifferent; O = one-dimensional; R = reverse; M = must-be; S = skeptical

In this summary, a picture of the customer preferences for specific attributes becomes apparent, providing answers to questions like:

- Which attributes will create greater product value to the customers?
- About which attributes do customers need to be educated?

Identifying customer perceptions of environmental attributes enables companies to make more informed strategic business decisions.

Example

BP Amoco, which used to stand for British Petroleum, is an excellent example of seeking to gain greater market share while investing in green design. After segmenting the market and analyzing the possibilities of profits in green design, they saw significant opportunity in re-branding themselves as the energy company of choice for the “environmentally aware motorist” (Beder 2002). This effort shows a conscious effort by bp to target lead, high volume, and loyal green customers. It targets the lead group because it shows it’s investing in solar and wind energy resources, marking bp as the first oil company to begin investing in alternative energy sources. It targets the high volume group because energy is such a high volume industry by nature and large companies with a sense of corporate social responsibility will spend billions of dollars with bp. Bp also targets loyal green customers because of its commitment to the environment. By leading the pack of oil companies in green design, Beyond Petroleum seeks to generate a profitable business market and a competitive advantage. While it should be noted that Beyond Petroleum still generates 98.5% of its income from oil and fossil fuels, the effort to implement green design shows a potential market of environmentally conscious customers and bp’s efforts to capture it. Market research and customer analysis have given them the necessary information to make profitable business decisions.

Where to get more info

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- Sharon Beder, 'bp: Beyond Petroleum?' in *Battling Big Business: Countering greenwash, infiltration and other forms of corporate bullying*, edited by Eveline Lubbers, Green Books, Devon, UK, 2002, pp. 26-32.
- Finster, Mark., Eagan, Patrick. & Hussey, Dennis. (2002) “*Linking Industrial Ecology with Business Strategy*”, *Journal of Industrial Technology* 5, (3), 107-125.
- Murphy, Cait. (2002) “*Is bp Beyond Petroleum? Hardly*”, *Fortune* 146, (6), 44.

Xerox Corporation is one example of a company currently seeking to fulfill their perceived environmental responsibility. Xerox employs Green Design techniques in their product manufacturing in the following ways:

- Recyclable- Xerox created materials with a reduced materials mix, making them much easier to separate and recycle.
- Energy efficiency- Xerox designs products that use less energy, saving consumers money and the environment energy.
- Supply chain policy- Xerox has a set of guidelines that each of their suppliers must follow to maintain their supplier status.

In 2003 alone, Xerox succeeded in energy savings of 51 million therms (nearly 1.5 million megawatt hours) of electricity through the energy-efficient design of product features and the reuse of parts. In addition, they averted 144 million pounds of prospective landfill waste through their cartridge recycling and parts reuse policies.

Recognizing their impact as one of the largest brands of cut-sheet paper in the world, Xerox also insists that all of their suppliers follow a stringent set of guidelines. By employing these environmentally friendly techniques of production, Xerox was able to uphold its core commitment to environmental responsibility.