ABSTRACT

VALUE- CENTERED DESIGN FRAMEWORK FOR SUSTAINABILITY

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In recent years, there has been a lot of focus, emphasis and debates on sustainability in the development process, in manufacture as well as from consumer perspective. An entire gamut of stakeholders such as governments, Industry bodies, policy institutes, and consumers have all been involved in this debate. One of the key understandings of sustainability is that it is a systematic concept that actively involves different elements, all of whom have to be considered together within a given situation. (Redclift, 1987, WCED, 1987, UNCED, 1983, DREDNER, 2002, Baker, 2006). These are most commonly seen as economic aspects, environmental aspects, and Social aspects, sometimes also stated as profit, planet and people (Elkington 2001), or, also as the Triple Bottom Line approach (Ekins, 2000) (ThomasA,2010). Over time, sustainability related approaches have been set forth by specialists in various fields.

In the field of product design, existing approaches such as 'Design for environment' and 'design for sustainability' are seen to aim at developing 'sustainable solutions' through product-services systems to meet 'functional' needs and reduce use of physical resources ensuring sustainable consumption(Charter and Tischner,2001;Leong & Manzini,2006;Tukker & Tischner,2006;Vezzoli,2007). There has been concern that these tools have been predisposed towards environmental issues rather than building a comprehensive approach to sustainability (Sutcliffe, 2009). An additional concern is that product designers have yet to significantly include sustainability concerns especially when it comes to decision making in the various stages of product conceptualization, material selection, processing and manufacturing, product usage, and recyclability or disposal (bharma & Lofthouse, 2004). The literature review integrates knowledge from these fields of values, sustainability and their linkage with product design.

This study is an attempt to provide an orientation and tools to the community of product designers in designing of sustainable product designs. The study postulates that by focusing on the clarification and enhancing of Key values, product designers could assist in improved decision making that is oriented towards sustainability. One of the key arguments of the research is that products are carriers of values and enhancement of values that are oriented towards sustainability would lead to the development of products that have internalized and ensured sustainability at all stages of product development and usage.

The articulation and categorization of values has been attempted through content analysis of various institutions, organizations or companies as detailed in the methodology (Chapter 3). The findings (Chapter 4) clearly brought out the specific patterns of values among three sets of institutions, business, environmental, and social, and individual values. The analysis of sector specific organizations indicated in the presence of values specialization, enhancement, Hierarchy, & values prioritization. Through content analysis of sustainability definition and frameworks, sustainability values list was also prepared.

Sustainability debate indicates the conflicts between various sustainability domains. These conflicts have been brought out through selected case studies in the findings (Chapter 5) mirroring the interplay between the various domains. Understanding this interplay is crucial for undertaking the values trade- off and prioritization exercises that are a part of the VCDS framework. In the design context, product deconstruction methodology is applied to articulate enhanced values & conduct values congruency check.

The VCDS framework detailed in chapter 6 uses the values route to orient designers towards sustainability through ensuring presence of various categories of values & a values trade- off process.

Sustainability oriented values are enhanced in the product & values congruency mapping ensures product positioning based on values. Emphasis is carried through its lifecycle by integrating durability concerns & its footprint mapping within the decision making process. The design method for VCDS framework based product Conceptualization succinctly details the steps that designers should take for its proper implementation. The framework that ensures usage of values at the decision making stage in an explicit & integrated manner, encapsulating sustainability aspect in abstract, methodological and process level stages, and presents in the form of design method for utilization by designers. The validation of the framework has been through before after exercises with design students as well as expert feedback. The research thus proposes and validates a 'Values centered Design Framework for sustainability' that can be used by product designers, for enhanced decision making oriented towards sustainability.