- Asna Mubashra

New Essentials for Effective Clothing Design for Physically Challenged

Abstract:

Design has recently been recognized as problem solving activity. This research was an effort to unravel comprehension of the complex activity of design and developing an insight of the nature and methodology in which creative thinking skills are put together in the user-centered mannerism of thriving contemporary clothing design for physically challenged. User Centered Design approach requires a great deal of involvement from the users during the whole process of designing. The challenge of design is more pronounced when special problems of the aged, infirm and handicapped arise for solutions. This study comprises of a collaborative workshop to explore and compare dissimilar design practices. The transformed approach to design methodology of prioritizing understandability and usability over aesthetics and technology is found to be more efficient. This new wave in favor of user centered design is now more than only a method rather it is emerging as the new mindset for interpretation of problems of design for twenty first century

Key words: User centered design, physically challenged, design methods

Design is recognized as a problem solving activity (Nigel, 2011). Recently investigations of design philosophy, design methods and design processing graduated as scientific studies in social sciences. All activities associated with design evolved in diversified ways; among most recent evolutions is user-centered design approach which emphasizes that the purpose of any design is to serve the user, not to use a specific technology or not to be an elegant piece (Buchanan, 1992). User-centered designing involves extensive attention to the needs, wants, and limitations expressed by the ultimate end users of product or service throughout the development stage of design process. The needs of the

users dominate the design, and ultimately these dictated needs of the design dominate rest of the system. (Kronenburg, 2006).

In contemporary complex socio technical systems of human society, activities of design have a varied range of applications (Donald, 1990). Clothing is one of basic human needs hence holds a large-scale design implication (Kottke, 1982). Clothing designing is specifically related to the application of established principles of design to the process of dress making as well as accessory designing (Kidd, 2006). Among the contemporary concepts of transgenerational design focus is developed on the fact that human aging is a continuous process that starts at birth and ends in death, with probability of experiencing occurrences of illness, accidents and declines in physical and sensory abilities causing impairment of independent lifestyle as well as occurrence of restrictions on activities (Herbert, 1988). Four facts clarify the interrelationship of age with physical and sensory vulnerability:

1) Young people become old,
2) Young people can become disabled,
3) Old people can become disabled,
4) Disabled people become old.

Within each situation that impairs independent lifestyle, users expect availability of suitable products and in such condition clothing commodities hold much importance (Beamish, 1999). Adaptive clothing is a design concept that is focused on decreased joint movement while dressing (Kidd, 2006). User-centered designing is characterized as a multi-stage problem solving process and can be integrated to adaptive clothing design practices; within this conceptual logic rest the consideration of creating adaptive clothing designs focusing on the disability engendered decreased joint movement while dressing.

The problem of finding suitable clothing for individuals with physical challenged has been a topic of concern for clothing, medical, and rehabilitation researchers for over half a century (Deepti, 2011). Beginning in the 1940s, clothing and medical professionals started to examine the relationship between clothing and physical challenges (Behrens, 1963). The bulk of this research resulted in publication of various self-help guides for the handicapped and their caregivers, designed primarily to ease daily processes of dressing (Boettke & Zook, 1956). Subsequent research in the latter part of the 20thCentury explored the psychological issues of adaptive clothing, primarily by assessing the importance of clothing as an appearance management tool (Campbell,

Maxey, & Watson, 1995). Some previous research was done from caregiver's point of view and resulting relief was also focused for the caregiver and not for the real user (Ali, 2004). In the late nineteenth century psychologists, sociologists and anthropologists engaged in study of the social significance of clothing (Candy, 2007). It is now well established that clothing is an important facet of the human constructed environment, therefore has bearing on quality of life (Kottke, 1982).

Such clothing design approach is presently more focused on technology centered designing, that involves invention of new technologies and their implementation into all aspect of life without recognition of real needs of end users. On the other hand, the user-centered designing approach not only requires designers to initially analyze real demands of end users and fore see how users are likely to use a product, but also to test the validity of their assumptions with regard to user behavior in real world tests (Boettke & Zook, 1956). User centered designing approach of all kinds is paying more attention on repurposing of existing technologies instead of just invention of new ones without real life applications (Herbert, 1988). Thus it is of much importance to understand the academic conceptualization of value oriented, adaptive clothing designing as a user centered design activity.

Scope of Research

This research was an effort to unravel comprehension of the complex activity of design and developing an insight of the nature and methodology in which creative thinking skills are put together in the user-centered mannerism of thriving contemporary design (Nigel, 2011). Researcher herself has the background of textile design and fashion design, during this research she has primarily worked as fashion and textile design researcher with an interest in a specialized aspect of fashion designing that is needed to persuade current societal concerns publicized by designers across the entire professional domains of design practice. This research based venture has tried to bring into limelight a more suitable design approach whilst the task of designing is centered upon working for design solutions for a specific challenged segment of population, which previously has been an overlooked consumer niche of society. All reported substantiation came for observation, experiment, analysis and reflection during the whole course of research.

What is Design Thinking:

Design thinking is inherent within human cognition; it is a key part what makes us human. It is a historical truth that everybody can and does designing. Long history of design thinking can be traced back in the evidences of artifacts of previous civilization s as well as in practices of contemporary design and time-honored crafts (Nigel, 2011). Design is found in everything around us natural as well as man-made. Success of man-made design effort is gauged by how strongly it affects the quality of life of the user. Innovative, effective, efficient, inspiring, ethical and stimulating designing is much needed now than ever before. Herbert Simon stated: "everyone who devises courses of action, to change existing situations into preferred ones, is doing design" (Herbert, 1988)

Surprisingly despite the importance of good designs design activities have always been considered as an activity needing no special abilities. It is only very recent that possession of some exceptional talent is regarded as a basic ingredient in pursuing successful designs (Nigel, 2011). The traditional craft based activities need no separate prior activity like drawing and modeling before the activity of making, on the contrary the modern industrial production indulges in a complete design process before the activity of making or production. It is worth knowing that these design activities are necessarily based on one of diverse formal methods, each design method is chosen for its appropriateness in particular purpose. As a result growing number of academic and professional bodies of knowledge are now emerging to bring into limelight nature of different design methods and core features or aspect of particular design mannerism (Beamish, 1999). Usually design is a problem solving activity but it definitely is not a search for the optimum solution of any given problem alone but it is an exploratory process comprising of the interpretations proposed by the designer after understanding the design brief to reach to something new rather than reaching to some existing optimal point. Instead of understanding designing as a mysterious activity it has to be comprehended that it is one of highest forms of human intelligence , expert designers utilize enhanced forms of certain tacit, deep-seated cognitive skills which can be unraveled in terms of the context of the task (Herbert, 1988). The tricky relationship between the problem (what is required) and its solution (how to satisfy that) is endorsed by almost all designers across all domains of design. One unanimous consensus across all types of

design is placing greater emphasis on clearly defining the design problem, any attempt that fails to fulfill this fundamental step usually results in ambiguities not only during the other steps of design process but same is evident in resulting solution (Nigel, 2011). All attempts made to set out models of an ideal design process and suggestions for the methodologies or structured approaches to lead designers efficiently towards a good solution base their debate anchored to true identification of design problem. The main objective was to reveal and articulate the apparently ambiguous cognitive and creative abilities of designers, that are common across many domains of designs

Turn of new millennium witnessed emergence of higher level design practices which complicated the traditional design areas commonly known as industrial/product design, graphic design, architecture and fashion design. Designers across these sub-discipline were unmistakably clear about the set of skills they were required to know in to proceed to a meaningful outcome design. Presence of clear technical rules and specifications needed to be adhered to were adequate to complete each traditional design practice. Higher level designing has become a wicked problem as it involves a larger number of diversified stakeholders who must work as co-creators to face challenges of complex design practice (Herbert, 1988) .

In today's world every one of us find him or herself surrounded by a large number of man-made items, most intended to make lives easy and pleasant. There is increasing probability among high level design solutions that claims of time saving, fast production and superior results turn to redundant consequence of increasing stress to life. Contemporary designers have to be more sensitive towards finding solutions to problems of life and consideration of the needs of people. Globalization has resulted in similar utilization of modern technology to all nations and industries. The new trend of prioritizing usability and understandability over aesthetics forms the first conceptualization of product got much appreciation among present designers of different domains. Inclusion of the principles of usability and understandability with consciousness of societal concerns and ethical norms has become a assurance of competitive edge for companies. Instead of following personal instincts, successful designers need to study their direct clients to take into account their real needs and interests so that consumer can have best return of their investments. Mechanical ineptitude is increasingly mirrored among users of every day products, globally. "Designing well is not easy"

(Donald, 1990). A close examination of structure of actions of a design activity reveals that it starts with identification of what is required, this defines the ultimate goal of the design venture that is to be achieved. Proposing, executing and evaluation are other three important milestones which successfully take place only if first step is acknowledged well. Designs are ruled by one of three philosophies; aesthetics, usability, easy and inexpensive manufacturing. Each consideration contributes towards addressing whole process of designing, but inadequate dominance of one contributes to the resulting dissatisfaction (Kronenburg, 2006).

Evolution of Design Concept

Last two decades of previous century showed a greater rigor in the discovery of new methods for the improvement of designs and services for ultimate progress of business (Nigel, 2011). Evolution of different design methods did not follow a clear linear progression of methodologies but analysis of evolutionary changes can be traced through history (Buchanan, 1992). Since the time of Plato's republic exercise of participatory design methodology can be traced. Deep rooted democratic approach of Greek society was an ideal platform for the nurture of participatory methodologies in designing. The explosion of technological advancement by the mid of last century led to the popularity of engineered system designs, giving priority to the introduction of latest technologies in designs across all domains. By nineteen eighty the developing design philosophy unfolded itself as interaction design, it borrowed many techniques from science. Despite resulting increased production due to engineered designing and incremental designing the negligence towards user experience and stakeholder input was strongly realized. Usability was the ultimate criteria of success and emotional reaction of consumer to gadgetry was largely ignored. In cases of conflicts between designers on one side and user and stake holders observations on the other hand preference was given to the designers engineered approach that based itself on success of usability. As a response to this total rejection of end user's experience an alternate design methodology emerged which was focused to transform the passive opinion of ultimate users into a collaborative co-design strategy. Design thinking was recognized as an emerging successful strategy across different faculties and industries by the end of twentieth century (Nigel, 2011).

User Centered Designing

The ease with which one can do things can dramatically affect our view of our self, our society and our world (Donald, 1990). Revolutionary design theorist Donald Norman is considered as the father of user-centered design concept who laid larger emphasis on design thinking for specialized problem solving mannerism. As a result of this transformation user interests and needs were preferred on the mere usability tests. Favor of end-user control and humanized approach to the entire process of designing was first extended by Norman but it was latter incidentally endorsed by various designers from broad area of industry and practice. The role of users elevated from being guinea-pigs to co-developers of the design system (Lamb, 1993). All these changes paved path for opening of a holistic perspective to design process. Acceptance of user role resulted in shift of techno-driven focus to humanized one throughout entire stages of design (figure 1). This human-centered design approach appears to hold larger potential for resolving wider societal issues of modern life. Current century adapted well to the transformed approach to design methodology across different fields. This new wave was now more than only a method rather it emerged as the new mindset for interpretation of wicked problems of design for twenty first century. It is strongly aimed at introduction of element of humanity and empathy of all stakeholders in the whole process of design (Parsons, 2009).

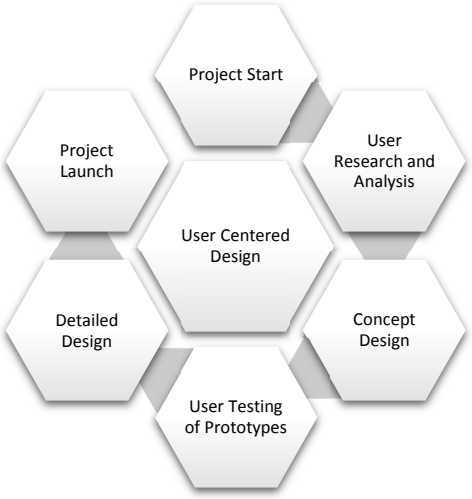

Figure 1: Process of User Centered Design

User Centered Design approach often requires a great deal of involvement from the users during the process. Carrying out this approach often includes collecting end users' opinion right before the start of the project, as well as during the design process, and designing with them. The objective of this is to allow the designers to have a good understanding of the subjects who will use the product. Therefore, good interaction between designers and users is the key under this approach (Parsons, 2009; Campbell, Maxey, & Watson, 1995).

Designing for Special Population

Divergence from average physical anthropometry creates a larger challenge for designers. Although such population constitute only about 5 percent of total population, but when translated to real numbers this segment is not negligible. The challenge of design is more pronounced when special problems of the aged, infirm and handicapped arise for solutions (Donald, 1990). Such special purpose designing emphasizes more the need of efficiency, simplicity and affordability. We experience decrease of physical agility, reduction of reaction time and deterioration of visual skills as we age. Such challenges cannot be met by simple solutions, these require a higher level of designer cognition, and a focused strategy to bring about real ease for the special user. In such cases only those design solutions earn appreciation where usability dominates over the aesthetics and manufacturability (Donald, 1990) Including excessive featurism and following false image from personal instincts are two deadly temptations for the designers.

This research is an effort to unravel comprehension of complex activity of design and developing an insight of nature and methodology in which creative thinking skills are put together in the user-centered mannerism of contemporary clothing and textile design. This study comprises of a collaborative workshop to explore and compare dissimilar design practices (Babbie, 1992). Among these one is user experience-led design activity and other is material-led design activity for a consumer textile article. The proposed design problem was to create effective everyday clothing for local adult female suffering from arthritis.

Efforts involved studying effect of user need assessment as primary component of textile design process for proposed consumer textile article in contrast to common design practice. Furthermore, significance of the academic conceptualization of consumer textile designing as a user centered design activity increased by review of existing literature which

suggested that design researches focusing on user needs at the initial stage of design is rare.

Conclusion

It was observed that acquaintance and experience of user centered textile design processing equipped designers with richer knowledge to implement their skills on material handling resulting in enriched problem-solving. Table 1 is a comparison of two design strategies used here; manufacturing or product centricity against user or customer centricity

Table 1: Comparison of User Experience Based Design and Material Based Design

	User Experience Based Design	Material Based Design
Philosophy	Serve the customer	Sell product
Orientation	Interaction Oriented	Market oriented
Strategy	Satisfaction	Profitability
Outcome	Customer Value	Sale Maximization

Commonly the tricky relationship between the problem (what is required) and its solution (how to satisfy that) is endorsed by all designers across all domains of design. One agreed upon fact across all types of design methods is placing greater emphasis on clearly defining the design problem, any attempt that fails to fulfill this fundamental step usually results in ambiguities not only during the other steps of design process but same can be evident in resulting solution. Contemporary designers have to be more sensitive towards finding solutions to problems of life and consideration of the needs of people. Innovative, effective, efficient, inspiring, ethical and stimulating designing is much needed now than ever. Growing number of academic and professional bodies of knowledge are now emerging to bring into limelight nature of different design methods and core features or aspect of particular design mannerism. Current century adapted well to the transformed approach to design methodology of prioritizing understandability and usability over aesthetics and technology. This new wave in favor of user centered design is now more than only a method rather it is emerging as the new mindset for interpretation of problems of design for twenty first century. It is strongly aimed at introduction of element of humanity and empathy of all stakeholders in the whole process of design. Inclusion of the principles of usability and understandability with consciousness of

societal concerns and ethical norms has become an assurance of competitive edge. Successful designers need to study their direct clients well to take into account their real needs and interests so that users can have best return of their investments.

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