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User Centred Design: A New Essential for Effective Designs for the Physically Challenged

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Design has recently been recognised as problem solving activity. This research was an effort to unravel comprehension of the complex activity of design and to develop an insight of the nature and methodology in which creative thinking skills are put together in the user-centred mannerism of thriving contemporary clothing design for physically challenged. A user centred 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 solution. This study comprises a collaborative workshop to explore and compare dissimilar design practices. The transformed approach to design methodology of prioritising understandability and usability over aesthetics and technology is found to be more efficient. This new wave in favour of user centred design is now more than only a method, rather it is emerging as the new mindset for the interpretation of problems of design for twenty first century.

Key words: *User Centred Design, Physically Challenged, Design Methods.*

Introduction

Design is recognised 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-centred design approach which emphasises 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-centred designing involves extensive attention to the needs, wants and limitations expressed by the ultimate end users of a 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 the 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 desig is specifically related to the application of established principles of design to the process of dress making as well as accessory designing (Kidd, 2006). One of 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 the 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 the availability of suitable products, and in such conditions 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-centred designing is characterised as a multi-stage problem solving process and can be integrated to adaptive clothing design practices; within this conceptual logic rests 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 challenges 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 the 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 20th century 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 the 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 centred 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-centred designing approach not only requires designers to initially analyse real demands of end users and foresee how users are likely to use a product, but also to test the validity of their assumptions with regard to user behaviour in real world tests (Boettke & Zook, 1956). User centred designing approach of all kinds is paying more attention on the repurposing of existing technologies, instead of just the invention of new ones without real life applications (Herbert, 1988). Thus, it is of much importance to understand the academic conceptualisation of value oriented, adaptive clothing designing as a user centred 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-centred mannerism of contemporary design (Nigel, 2011). The researcher herself has a background of textile design and fashion design. During this research she has primarily worked as a fashion and textile design researcher with interest in a specialised aspect of fashion designing that is needed to persuade current societal concerns publicised by designers across the entire professional domains of design practice. This research-based venture has tried to bring to light a more suitable design approach, whilst the task of designing is centred upon working for design solutions for a specifically challenged segment of the population, which previously has been an overlooked as a 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 of what makes us human. It is a historical truth that everybody can and does design. The long history of design thinking can be traced back in the evidence of artifacts of previous civilisations as well as in practices of contemporary design and time-honoured crafts (Nigel, 2011). Design is found in everything around us, natural as well as man-made. The 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 more 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 recently that the 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 modelling before the activity of making, on the contrary 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 a particular purpose. As a result, a growing number of academic and professional bodies of knowledge are now emerging to bring into the limelight the nature of different design methods and core features or aspects of particular design mannerism (Beamish, 1999). Usually, design is a problem-solving activity. It is definitely not a search for the optimum solution of any given problem alone but rather 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 as one of highest forms of human intelligence. Expert designers utilise enhanced forms of certain tacit, deep-seated cognitive skills which can be unravelled 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 the same is evident in the 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 the design problem. The main objective is to reveal and articulate the apparently ambiguous cognitive and creative abilities of designers, that are common across many domains of designs.

The turn of the new millennium witnessed the 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-disciplines were unmistakably clear about the set of skills they were required to know to proceed to a meaningful outcome design. The presence of clear technical rules and specifications needed to be adhered to that 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 the 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 our lives easy and pleasant. There is increasing probability among high level design solutions that claims of time saving, fast production and superior results as a consequence increase stress in life. Contemporary designers have to be more sensitive towards finding solutions to problems of life and to the consideration of the needs of people. Globalisation has resulted in similar utilisation of modern technology for all nations and industries. The new trend of prioritising usability and understandability over aesthetics forms the first conceptualisation of product, receiving much appreciation among present

designers of different domains. Inclusion of the principles of usability and understandability together with a consciousness of societal concerns and ethical norms has become an assurance of a 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 consumers 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 the structure of actions of a design activity reveals that it starts with the identification of what is required; this defines the ultimate goal of the design venture that is to be achieved. Proposing, executing and evaluating are other three important milestones which successfully take place only if the first step is acknowledged well. Designs are ruled by one of three philosophies; aesthetics, usability, or easy and inexpensive manufacturing. Each consideration contributes towards addressing the whole process of designing, but inadequate dominance of one contributes to resulting dissatisfaction (Kronenburg, 2006).

Evolution of Design Concept

The last two decades of the previous century showed a greater rigor in the discovery of new methods for the improvement of designs and services for the ultimate progress of business (Nigel, 2011). The 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, a methodology can be traced. The 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 middle 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 1980, the developing design philosophy unfolded itself as interaction design, borrowing many techniques from science. Despite the resulting increased production due to engineered designing and incremental designing the negligence towards user experience, stakeholder input was strongly realised. 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 recognised as an emerging successful strategy across different faculties and industries by the end of twentieth century (Nigel, 2011).

User Centred 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 the user-centred design concept, who laid larger emphasis on design thinking for

a specialised problem solving mannerism. As a result of this transformation, user interests and needs were preferred on the mere usability tests. The favour toward end-user control and a humanised approach to the entire process of designing was first extended by Norman but it was later incidentally endorsed by various designers from a 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 the path for the opening of a holistic perspective to the design process. Acceptance of the user role resulted in a shift of techno-driven focus to a humanised one throughout the entire stages of design (figure 1). This human-centred design approach appears to hold larger potential for resolving wider societal issues of modern life. The 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 the twenty first century. It is strongly aimed at the introduction of elements of humanity and empathy of all stakeholders in the whole process of design (Parsons, 2009).

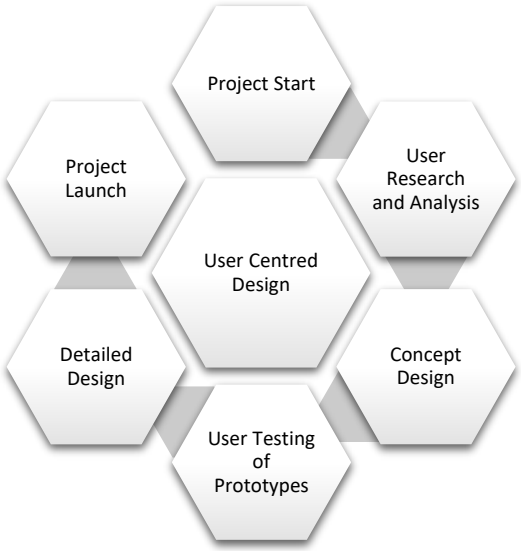

Figure 1: Process of user centred design

A user centred 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 Populations

Divergence from average physical anthropometry creates a larger challenge for designers. Although such population constitute only about five percent of the total population, when translated into 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 solution (Donald, 1990). Such special purpose designing emphasises 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. Instead these require a higher level of designer cognition and a focused strategy to bring about real ease for the 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 designers.

This research is an effort to unravel comprehension of the complex activity of design and to develop an insight of the nature and methodology in which creative thinking skills are put together in the user-centred 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 another is material-led design activity for a consumer textile article. The proposed design problem was to create effective everyday clothing for a local adult female suffering from arthritis.

Efforts involved studying the effect of user need assessment as a primary component of the textile design process for the proposed consumer textile article in contrast to common design practice. Furthermore, the significance of the academic conceptualisation of consumer textile designing as a user centred design activity increased, by a review of the existing literature, which suggested that design research focusing on user needs at the initial stage of design is rare.

Conclusion

It was observed that the acquaintance with and experience of user centred 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 Maximisation

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 on 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 the design process but the same can be evident in the resulting solution. Contemporary designers have to be more sensitive towards finding solutions to problems of life and consider the needs of people. Innovative, effective, efficient, inspiring, ethical and stimulating designing is much needed now, more than ever. A growing number of academic and professional bodies of knowledge are now emerging to bring into light the nature of different design methods and core features or aspects of this particular design mannerism. The current century has adapted well to the transformed approach to design methodology of prioritising understandability and usability over aesthetics and technology. This new wave in favour of user centred design is now more than only a method; rather it is emerging as the new mindset for the interpretation of problems of design for the twenty first century. It is strongly aimed at the introduction of elements 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 a 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.

REFERENCES

Ali, W. M. (2004). *Assessment of Low Back Injury Risk in Residential Care Workers.* Burnaby, BC, Canada: Simon Frazer University.

Babbie, E. R. (1992). *The practice of social research.* Belmont, CA: Wadsworth Publishing Company.

Beamish, J. (1999). *Barrier-Free Design Class Notes.* Department of Near Environments: Virginia Polytechnic Institute and State University,Blacksburg.

Behrens, D. (1963). *Fashions for the woman who needs specially designed clothes.* Cleveland, OH: The Services.

Boettke, E. M., & Zook, M. O. (1956). Dress Design With Self-Help Features for the Preschool Child. *Journal of Home Economics, 48*(8), 643-646.

Buchanan, R. (1992). Wicked Problems in Design Thinking. *Design Issue, IIIV*(2).

Campbell, J., Maxey, V., & Watson, W. (1995). Hawthorne Effect: Implications for Prehospital Research. *Annals of Emergency Medicine*, 590-594.

Candy, F. J. (2007). The Wardrobe And Well Being: Exploring Relationships Between Women Living With Rheumatoid Arthritis And Their Clothing. *Conference paper presented at Helen Hamlyn Centre, RCA*. Department of Design, University of Central Lancashire, UK: Lancashire School of Post-Graduate Medicine and Health.

Cookman, H., & Zimmerman. (1961). *Functional fashions for the physically handicapped.* New York : Institute of Physical Medicine and Rehabilitation, New York University Medical Center.

Deepti, G. (2011). Functional Clothing----------Definition and Classification . *Indian Journal of Fiber & Textile Research* , 321-326.

Donald, A. N. (1990). *The Design of Everyday Things.* United States of America: Doubleday/Currency.

Herbert, A. S. (1988). The Science of Design: Creating the Artificial. *Design Issues, VI*(1/2), 67-71.

Kidd, L. K. (2006). A case study: creating special occasion garments for women with special needs. *Clothing and textile research journal*.

Kottke, F. J. (1982). Philosophic considerations of quality of life for the disabled. *Archives of Physicians Medical Rehabilitation*, 60-62.

Kronenburg, R. (2006). Fabric Architechture and Flexible Design. *Architectural Design*, 74-80.

Lamb, J. M. (1993). *Physical Disability as an Aspect of Appearance.*

Nigel, C. (2011). *Design Thinking: Understanding How Designers Think and Work.* New York: BERG, Oxford.

Parsons, T. (2009). User centred design, through enlightened in theory. *Blueprint*, 54.