Design for All

Guest Editor
Margaret H. Teaford, PhD

Content of March 2014 Vol-9 No-3

Other Regular features

Chairman's Desk:

Dr. Sunil Bhatia

Role of design of output is as important as input design. Designer cannot ignore the part of the output plays but how much they wish to contribute time for designing workable output is a real tough task. When we discuss about design of say a house with architect, we never bother or least discuss about outlets design .We discuss about living, bedrooms, kitchen, toilets, and bathrooms and assume it covers all output design. Problems come when servicing is required and it is difficult to handle or seepage or leakage that are due to faulty designs or improper execution would have been eliminated if we would have given proper thought at the time of design and would have not experienced uneasiness or faced troublesome situations or damaged the interior or functionality of design and situation is beyond our control & cannot do anything but repent. Generally we emphasize design for inputs and completely overlook its outlets. Have we ever discussed at the time of purchase of vehicle what its emission ratio is? There are various ways to judge the quality of vehicle and best way is what are the emission contents and percentage or mileage per liter. We act like ignorant and are driven by market forces and mediocre products generate interest

among us and it becomes instant hit but beauty of such products is that quickly loses its sheen and fades into oblivion. Designing to fool others is successes mantra of present era but in reality that befooling actions bounce back in such unpredictable form that has even power to wipe out the generation.

Design of outlet has made the major contribution in differentiating behaviors of man and woman. Woman are nature carrier and designed in such a way that it should perform her role without much difficulties and it is the reason humans are surviving inspite of all odds from the days of origin of man. Every living being reasons out continuity of life are in many ways but few are commonly known. Some are laying eggs; some are replicating the same form as in the case of man, some are dividing their cells. Plant kingdom preserves life in potential form of seeds or grafting or parts of stems or roots are regenerating the same. Nature is equally giving importance to continuity of lives by designing perfect mechanisms for progress of lives without any interruptions by giving opportunities of mutation of genes for better survival in changing environments keeping in mind the design of outputs. Secret of sustainability of nature depends on one's output becomes lives of others.

Imagine an individual who is suffering with constipation or dysentery or enlarge prostrate or dysfunction of any body part and examine his behavior? The faulty design of output creates problem whether it is under performing or over performing what for it is meant. Similarly woman is gifted with special anatomy where she is are extra cautious during mensuration or pregnancy? Her outputs for bearing, delivering child and nurturing with her breast milk make her behavior different and nature also does her duties by obliging in protecting woman with special care. Woman surrendering herself to

man of her choice is an act of expressing her love and wishfully accept the process of labor pain that can even take her life. Other side man thinks it is his birth right and this is visible in animal kingdom also. I have noticed cow is moving with humbleness but bull moves majestically .Ox is neither male nor female and it is the design of man cruelty toward animal for manually crushing their genital parts for achieving the objective for using them in transportation. This cruel act is practice for controlling the desire of sex in woman is prevailing in some communities and it is nothing but inhuman act and it should be not only condemn but educate people that it is cruelty and disrespect for woman. Her role of breastfeeding generates different sensation in her body and affects her mind and that makes her emotionally more attach and behaves in different to her offspring than man. Once she conceives men are completely disassociated with child and his role is limited to provide protection at worldly level because our social system is designed for result oriented and it is nothing but based on output .Her different behaviors makes me to believe that woman was compelled & born to stand. I look at her eye sockets that is unlike other animals does not place in sideways confirms my belief. Imagine woman walking with four legs and present scenario of her eyes allows seeing limited areas compared to she is standing. Able to see limited area makes her more vulnerable of attack by her enemies .Another reason in support of limited vision is that she can look at ground with ease when she is on four legs and strenuous to look upward for long time to cover wider area. Standing gives both visual for looking at ground as well as sky that allows her movement better for safety. Limited vision even today creates fear among people & they prefer to stay in known environments that curtail mobility. Faster mobility was

essential for survival as well as continuity of life. Why life should move? Mobility is integral part of our survival but and it is synonymous with fear of unknown. Wild animals killed their prey by focusing on attack of breaking neck. Standing position of person prevents this and another advantage they can resist attack. Pregnant woman has limited movement but standing gives edge over her enemies and can protect her bearing child in all possible attack. If equilibrium is not maintained is it possible nature will collapse?

Industrial designers focus more on input designs because our world is commercial and social aspects are missing and it needs optimization with minimum input. Automobiles industries are competing and prove superiority by declaring mileage per liter but no one is to bother about what is carbon emission. It is the other agencies who have stacks in government are pressurizing to follows some norms & standard for controlling pollution. Government latest announcements for incentive in the tax slab to manufacturers who are declaring mileage per liter. It is welcome steps and it is bound to be effective because it suits their mind set of commercial interest will shift their focus to output design. If proper equilibrium is not maintained in input-output product will not perform what for it is designed and it will prove noncompetitive. Another factor is difference in behavior in gender forces the designer to incorporate the masculine as well as feminine features like we did in automobiles with kick start and it is also with self-starter. It was attempt to introduce the concept of universal design. In financial world performance is judged by output and detailed studies only focus on ratio of input and output. Testing is conducted either by black box or white box and it is nothing but giving a specific input to

observe the output. Assembly line design is nothing but detailed studies of stages and proper interface of input and output of preceding and succeeding activities. The outputs designs need focus on the state variables and observation. Some time to eliminate the manual observation we design the feedback control. Sometime we design the lining or gaskets for controlling desired environments; Design of filters is nothing but design for desired output. What is the role of observation? Our brain has the tendency to self-organize and, thus, reduces complex visual patterns to simple shapes. This increases with distance and is particularly relevant when visibility is poor and, not surprisingly, in busy and cluttered environments (Gestalt theory). It was the output for not achieving the objective helped the ancient person to design the wheel. Design of products in primitive times is still in use and no better replacement is yet found. Football is designed by ancient people appears to be simple design by stitching pieces of leather in hexagonal and pentagonal in such way that it takes the shape of sphere. The same concept of hexagonal to cover every inch of area for network communication is most effective design. To organize the hairs comb was designed, to cut the items knife was and various types of knots were to control the different situations. Domestic animals like cow or buffalos are tied with rope in a special knot with small pole to prevent their escape. These animals generally tried to pull hard in attempt to break the rope. More they pull more rope tightens with pole and prevents escape. Dogs are controlled in different ways by using straps around their neck because they are little smart and can untie the knots with their mouth if we treat them like cow or buffalo. Hen, cook, parrot or small bird forced the primitive person to design the cage for preventing the escape as well protects from their enemies'

attack for food. The design of cage is inhuman act but it helps in protecting the cage bird do not have strength to fight with attacking animals and wild animals are control by caging for harming the humans . The requirement of jets and showers forced the designer for achieving that output by designing nozzles and mesh. Reverse engineering concept has come into existence because of output design. The birth of phycology is based on cause and affects analysis and it is entirely based on output design. Analysis of man's mind is judged by what he is speaking is nothing but based on output design. We judge the person by his different output of body language, verbal communication and what his actions are. It all is output.

Medical sciences equipment's are designed to observe the outputs. X-ray, ECG, ultra sound, MRI and many more are based on output design concept. We still need lots of efforts to meet the basic challenges in patient care and we failed to produce spill proof container that can collect the urine of sick woman because her anatomy is different from man for urinating. It is easy for man to urinate in even old age. Accessibility, relevance, timeliness and accuracy are completely ignored in these areas. Useablity is not achieved. Why designers are not focusing on output design as our ancestors did. If I look at our refrigerator or pressure cooker I find to maintain the desired environment we provide specific control input and designed insulated with proper gasket to escape the cold and other side heat is given to thick pot with proper gasket that can bear the pressure of steam with safety valve to release the pressure in emergency. Another is Valve of bicycle tube it allows to input the air pressure from pump but does not allow escape of pressure air. It is so simple design and it amazes even today. Another simple design

for output management is wonderful if I look at extraction of oil machine it is simple design of output management. Here input is indifferent form and separation of oil from crushed is amazing. Third is brake mechanism of any vehicle. How to control the input force that is generating movement and control its already applied force by designing brakes for the output for achieving the objective of stopping also amazes me. The design of hydro power for generation of electricity is biggest revolution by mankind and I salute the person who thought water force can be generated as perennial source for movement of turbine. Is it not output design where output of water force is dynamo for turbine? What height or size is required for storage of releasing water for generation of movement was really great achievement of designers.

Women are real founders of progress of society because they have habit of examining minutely and try to work on detailing for achieving outputs. In simple way we can say that it is feminine character to first look at outputs then proceed further for achieving it. I am confident while looking at modern women that habit of ancient women is still intact in them while knitting or crochet or tailoring, woman first imagines the size of the person and then she proceeds that makes me to believe she is responsible in designing the art of weaving and preparation of clothes. The manual grinder by using the two rounds of stone slabs is remarkable design by women and concept is still in use in modern time .Preservation of pickles for future use is nothing but design of time frame output design for prevention from spoiling its content from environmental effects. Selection of mate for providing muted genes of child is done by subconscious mind of woman is nothing but better output. Even design of wheel and later on converted to pulley for lifting water was

idea of woman. Winnowing fan is definitely designed by woman. Artist, painters, sculptures and other performing artists have imbibed feminine characters of thinking about what would be output and minute detailing for concluding according to their skills makes it masterpieces. That is the reason these people are peace loving, lives with humility and avoid aggression. There is endless list of women's discoveries and innovations. Our society should be thankful for contribution of woman but irony is that we suppress & assume she is an object for man. Why does man behave in this manner? Other side mam looks for all possible way for coming close to her and that gives pleasurable sensation and heavenly happiness. Why both do not live respecting and sharing each other what for they are complimenting? Enjoy every the moment presence of both in life and it will fill romance and helps in inclusive growth. Inclusive growth by product is universal design or vice versa.

This special issue with Ohio State University and Dr. Margaret H. Teaford, PhD is the Guest Editor. She did complete justice with her role and result is true international special issue. I salute on the behalf of Design For All Institute of India the team for their valuable contributions for progress of society.

With re*gards*

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Forthcoming issues

"Women Designer year of 2014"

April 2014 Vol-9 No-4

Valerie Casey is a globally recognized designer and innovator. She is the Founder of the global social impact NGO, The Designers Accord, and the CEO of the US-based innovation consultancy, Necessary Projects. Casey was named a "Guru" of the year by *Fortune* magazine, a "Hero of the Environment" by *Time* magazine, a "Master of Design" by *Fast Company*, and one of the "World's Most Influential Designers" by *BusinessWeek*. The World Economic Forum has honored Casey as a "Young Global Leader." She will be Guest Editor of this issue focusing on women, design, and social impact.

May 2014 Vol-9 No-5

Rachna Khare is a Professor of Architecture and the co-coordinator of Centre for Human Centric Research (CHCR) at School of Planning and Architecture, Bhopal. Prior to this she was Senior Research Fellow, Jamsetji Tata Universal Design Research Chair at National Institute of Design, Ahmedabad. Rachna is a recipient of the Fulbright Doctoral Fellowship and was affiliated with Georgia Institute of Technology, Atlanta, USA during

her PhD in Inclusive Design. Her interest in the field of 'Universal Design' has earned research grants and awards nationally and internationally. She has published extensively and is one of the authors of Universal Design India Principles released in 2011.

June 2014 Vol-9 No-6

Josyane Franc is the Director of the common Department of International Affairs for the Cité du design and Saint-Etienne higher school of art and design (ESADSE). France

July 2014 Vol-9, No-7

MITZI BOLLANI Architect, Sculptor & Product Designer. She runs her own Architectural & Design Practice based in Piacenza since 1978, and focuses her work on the research of the psychological well-being for the users of her projects, acting as a primary target accessibility and safety for all individuals.

Mitzi Bollani is one of the founders of the "Design for all" concept that she applied the first time in Genoa: "Civis Ambiente – Accessible mobility in the Historical Centre": starting from the needs of people with activity limitation such as physical, sensory and mental or cognitive limitation, spaces, buildings and products were designed to be easily accessible to all, without losing the aesthetic value and above all without incurring in additional costs.

August 2014 Vol-9 No-8

Ms. Yasmeen Abid Maan, Assistant Professor, City and Regional Planning Department, LCWU Lahore College for Women University (LCWU), Jail Road, Lahore, Pakistan, is nominated as a Guest Editor and key Note will be by Prof Atiq Ur Rehman .

Ar.Yasmeen Abid Maan. Assistant Professor at Department Of City & regional Planning, Lahore College for Women University, Lahore, Pakistan.(Registered Member , Pakistan Council of Architects & town Planners.

With over ten years' experience in architectural design, I have exceptional skills and experience in planning, detailing, designing and coordinating projects both in the public and private sectors. My communication, problem-solving and leadership skills, combined with knowledge of theory and practical subject teaching, make me a highly valuable instructor in both Architecture and City & regional Planning department.

September 2014 Vol-9, No-9

Prof Lylian Meister, Dean of the faculty of design at Estonian Academy of Arts, Estonia, will be the Guest Editor. This issue will be about Design for All field research and outcomes in Estonia.

October 2014 Vol-9 No-10

Isabella Tiziana Steffan is an architect, and a certified European Ergonomist member of the executive board of the Italian Society of Ergonomics (SIE), expert in Ergonomics and Design for All.

She works in the field of accessible design and Ergonomics for public and private customers, focusing on mobility and safety of weak users and on urban furniture. She performs teaching activities for several Institutes, among which Politecnico di Milano, Università Cattolica del Sacro Cuore di Milano and Università degli Studi di Milano-Bicocca, where she leads the workshop "Accessible Tourism".

In 2012 she published two volumes: "Design for All – Il Progetto per tutti. Metodi, strumenti, applicazioni. Parte prima e Parte seconda". Collana di ergonomia, ed. Maggioli. Assignment editor, area Professione Ergonomia of "Rivista Italiana di Ergonomia" since she has been scientific representative and responsible for the Working Group – thematic area Design for All for SIE, the Italian association of Ergonomics and member of NAB (National Assessment Board for European Ergonomist) and CREE (Centre for Registration of European Ergonomists) for SIE.

She is co-founder of ENAT (European Network for Accessible Tourism).

November 2014 Vol-9 No-11

ANNAGRAZIA LAURA has a long experience in promoting the rights of people with disabilities within CO.IN. (Cooperative Integrate Onlus and then Consorzio Sociale COIN), an organisation involved in creating job opportunities for people with disabilities, also through accessible tourism, where she had the responsibility to develop the Group's Tourism Dept. at national and international level. She is presently responsible for Int.'l relations and European projects and represents CO.IN in several EU funded projects and international organisations.

Since 2009 she is a member of the Commission for the development and promotion of accessible tourism , set up by the Italian Ministry of Cultural Heritage and Tourism, where she participated to the study groups on Training and Accessibility.

Since 2013, she is the President of ENAT European Network for Accessible Tourism.

Authors

Susan Matthews, B.S., NCIDQ, *is an in-house Facility Planner at The Ohio State University Wexner Medical Center. She is a committee member on the Universal Design Exhibit at Ohio State's Molly Caren Center in London, OH. She is a graduate of The Ohio State University and has her NCIDQ (National Council for Interior Design Qualification) certification.*

Margaret Owens, PhD *is an Assistant Professor in the Construction Management major at Columbus State Community College. She teaches courses on construction documentation, methods, drawings, quantity survey, safety and loss prevention and is an OSHA authorized 10 and 30 HR for the Construction Industry instructor. Dr. Owens particular interests include Building Information Modeling (BIM) and Universal Design. She is currently teaching a set of courses about BIM which are requirements for a Building Information Modeling certificate that can be earned by Columbus State students.*

***Megan G. Pace, PhD** is an Adjunct Professor at Montclair State University, in Montclair, New Jersey. She teaches in the Fashion Studies program in the Department of Art and Design. She received her Ph.D. in Textiles and Clothing with a Graduate Interdisciplinary Specialization in Aging, from The Ohio State University in 2006. Her research interests include Universal Design in retail stores, the shopping behaviors of older adults, fashion merchandising, clothing and culture, and fashion marketing. Prior to pursuing a career in higher education, she worked as an Assistant Fashion Buyer, a Procurement Coordinator, and a Merchandise Assistant for Limited Brands in Columbus, Ohio.*

***Margaret H. Teaford, PhD** is an Associate Professor Clinical in the School of Health and Rehabilitation Sciences at The Ohio State University. She teaches classes on Universal Design and Home Modifications. She is also co-coordinator for the Universal Design Exhibit at Ohio State's Molly Caren Center in London, OH. She is a graduate of Mount Holyoke College and the University of Wisconsin and received her PhD from The Ohio State University. She is a Fellow of the Gerontological Society of America.*

Susan L. Zavotka, PhD, *is a Professor Emeritus in the Department of Consumer Sciences at The Ohio State University. She received her PhD from The Ohio State University and taught for over 20 years in interior design. She has written on Universal Design and was one of the founders of the OSU Universal Design exhibit. She currently lives in New England.*

Alyson Jurenko and Tessa Rodgers are undergraduate students in Health Sciences at The Ohio State University and worked on the Walking and Shopping Study in 2013.

GUEST EDITOR:

Margaret H. Teaford, PhD is an Associate Professor Clinical in the School of Health and Rehabilitation Sciences at The Ohio State University. She teaches classes on Universal Design and Home Modifications. She is also co-coordinator for the Universal Design Exhibit at Ohio State's Molly Caren Center in London, OH. She is a graduate of Mount Holyoke College and the University of Wisconsin and received her PhD from The Ohio State University. She is a Fellow of the Gerontological Society of America.

INTRODUCTION

Margaret H. Teaford, PhD

When I was asked to put together this special issue of Design for All in India focusing on women and written by women, my first thought was "well, of course, women hold up half the sky! What a great opportunity!" I was able to gather together a group of women working in the design field with a strong interest in Universal Design-- some of whom have been my students and others who are colleagues-- and begin planning for this issue.

Upon reflection, my view has gotten broader. Focusing on women and Universal Design is important not just because of the sheer number of women and their growing life expectancy around the globe, but also because of the many and important roles that they play in every society. The more obvious ones are those within the family of mother, wife, grandmother, daughter, and sister. These roles immediately make us think of caregiving for children, spouse, and parents. In the United States and elsewhere, women are the primary caregivers at all stages of the lifespan. How can we make environments that help them provide care and assistance to other generations? In this regard, we often think of the kitchen and the bathroom as areas in which care is given and received. Indeed, much of the focus of the work in Universal Design has been on these domestic areas of the home. Caregivers assist in so many tasks of daily living that we should help to develop environments that will make their work easier. And this can improve the quality of life for all in the household from the infant to the aging grandfather.

But the caregiving role is not merely in the home. Women are also helping family members as they navigate out in the community and encounter various physical barriers. Whether pushing a stroller or helping an older parent goes to the doctor's appointment, women are often the first to see any difficulties that are found in the environment. In most societies, women play an important role which is often called "shopper", but which is really more than that. Women not only go to the grocery store to purchase food for their families, they also visit the markets and bargain for the produce and other goods such as clothing that their families need and bring that home. In developing and developed countries, they also often help in food production itself and bring the goods to the marketplace for sale. Women are even responsible for hauling clean and safe water to their homes in many developing countries.

When we consider the many roles that women play, we have to consider the aging of almost all countries. By 2020, the number of older persons in the world will outnumber children under the age of five for the first time in history (Kinsella and Ha, 2008). We have recognized for some time in the western world and Japan that a growing percentage of the population was age 65 or older. By 2020, the median age in Germany will be 47 and in Japan 48. But these demographic changes are occurring in the developing world as well. By 2040, the median age in China will be 44 and in Brazil 41. (Kinsella and Ha, 2008, p. 17)

The majority of these older adults will be women who can be expected to outlive their male peers. But they are more likely than men to be disabled in some way. (Kinsella and Ha, 2008) This means that they will encounter more difficulties with the built environment. Often they are widowed and while the majority live with family; they

are also expected to help with household tasks and to care for grandchildren. Until very old age, they are usually providing more assistance than they are receiving from their families. But with poorer health and crippling chronic diseases such as arthritis, they have a distinct disadvantage in both the home environment and out in the community. Those who venture out of the home to help with household errands or for exercise can find that their health makes their mobility more difficult.

With these points in mind, we have decided to explore a variety of home and community environments and how they can be made more supportive to the women who use them.

- Sue Matthews uses a case study based on her observations as a designer and planner for a major medical center. She offers the re-design of the lobby restroom which can easily serve three generations and assist the woman who is caring for both small children and an aging parent.

- Megan Pace looks at experience and preferences of older women who are shopping for apparel for themselves and for others. She examines how Universal Design can be applied to the retail environment to make it not only more inviting to the shopper, but also easier to use.

- Walking is a popular exercise for older women as well as a way to accomplish errands. With the current emphasis on walkable communities, Alyson Jurcenko, Tessa Rodgers, and I developed a walking neighborhood checklist which could be useful in helping older adults age-in-place.

- **From her experience in construction management, Margaret Owens looks at efforts to attract more women to the traditionally male-dominated field and the benefits of having women's perspective on design and construction.**

CONCLUSION

Today women are working and living in many different environments; some of these environments are supportive, but others are challenging for women and for the public in general. The implementation of Universal Design principles can make these environments better for all to use. We hope that these articles will offer some new insights into the role of women in families and in the community and how Universal Design can help support them.

Margaret H. Teaford, PhD

__Margaret Owens, PhD__ is an Assistant Professor in the Construction Management major at Columbus State Community College. She teaches courses on construction documentation, methods, drawings, quantity survey, safety and loss prevention and is an OSHA authorized 10 and 30 HR for the Construction Industry instructor. Dr. Owens particular interests include Building Information Modeling (BIM) and Universal Design. She is currently teaching a set of courses about BIM which are requirements for a Building Information Modeling certificate that can be earned by Columbus State students.

Accessible BIM: Can Universal Design Principles be Implemented in Building Information Modeling and How Can Women Help?

Margaret E. Owens, PhD.

Construction Sciences & Engineering Technology

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Abstract: *Building Information Modeling (BIM) is a digital representation of the physical and functional characteristics of a building. Not only can it reduce construction costs and time, but it can be used to incorporate and check for Universal Design features in a project. Case studies illustrate examples of such use. Article contains discussion about the growing role of women in architecture and construction and how that may help to implement Universal Design principles into design and construction.*

Introduction

The increasing use of Building Information Modeling (BIM) in the construction industry provides a unique opportunity for the use of Universal Design (UD) principles as an integral part of the building model. Perhaps the best way to explore ways in which Universal Design might be implemented is to first define both Building Information Modeling and Universal Design. Next, several scenarios where Universal Design has been used in coordination with Building Information Modeling will be discussed. Then, possible methods in which BIM and UD may work symbiotically in the future will be proposed. Finally, a glimpse of ways in which women may be able to facilitate the inclusion process of Universal Design will be suggested. Although much of the previous research in the area of utilizing

Universal Design with Building Information Modeling has been conducted internationally, the scope of future initiatives for using UD in BIM will be limited to the United States as this is the geographical area with which the author has experience.

Building Information Modeling

"Building Information Modeling (BIM) is one of the most promising developments in the architecture, engineering and construction (AEC) industries" (Eastman, Teicholz, Sacks and Liston, 2011, p.1).

By definition, a Building Information Model (BIM) is a digital representation of physical and functional characteristics of a facility. As such it serves as a shared knowledge resource for information about a facility forming a reliable basis for decisions during its life cycle from inception onward ("About buildingSMART alliance", 2014). BIM allows an owner to build their next project virtually before ground has been broken and provides opportunities for simulating how the building will function. In addition, a simulated, three-dimensional model gives major stakeholders the ability to virtually walkthrough the building. As a result, the information extracted from the BIM model can save the owner money each day over the entire facility lifecycle.

BIM is a useful tool through all phases of a building's lifecycle. Initially, changes can be easily made with updates simultaneously implemented throughout the model. Construction progress scenarios can be run using the BIM model to determine the most efficient means and methods. A well-detailed BIM model may also be used by the owner's facility maintenance staff as a replacement for 2-D

record documents provided at the conclusion of the building process. Some of the benefits of BIM include increased building performance and quality because of the ability to implement various design alternatives as well as run various analysis and simulation tools to determine energy efficiency and sustainability.

The use of a 3D model provides the owner with an accurate visualization of the building's design. In addition, traditional 2D blueprints can be extracted from the model. As an aid during construction, clash detection programs can identify clashes where two objects in the 3D space occupy the same space and clearance conflicts as well as constructability issues before they become field problems, reducing costs and decreasing construction time. BIM can also be used as a tool to aid in design and construction planning and in the implementation of lean construction techniques, which may include a significant amount of building component prefabrication off-site to help reduce the total length of building construction time (Eastman et al, 2011). The implementation of Universal Design principles within a BIM model would seem a logical and cost-effective part of the building process.

Universal Design

Universal Design (UD) refers to a broad-spectrum of ideas intended to produce buildings, products and environments that are inherently accessible to older people, people without disabilities and people with disabilities ("Universal Design," 2014). There are seven basic principles that guide Universal Design.   (See chart 1.)

Chart 1: PRINCIPLES OF UNIVERSAL DESIGN

PRINCIPLE ONE: Equitable Use
The design is useful and marketable to people with diverse abilities.
Guidelines: 1a. Provide the same means of use for all users: identical whenever possible; equivalent when not.
1b. Avoid segregating or stigmatizing any users.
1c. Provisions for privacy, security, and safety should be equally available to all users.
1d. Make the design appealing to all users.

PRINCIPLE TWO: Flexibility in Use
The design accommodates a wide range of individual preferences and abilities.

Guidelines:2a. Provide choice in methods of use.
2b. Accommodate right- or left-handed access and use.
2c. Facilitate the user's accuracy and precision.
2d. Provide adaptability to the user's pace.

PRINCIPLE THREE: Simple and Intuitive Use
Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
Guidelines: 3a. Eliminate unnecessary complexity.
3b. Be consistent with user expectations and intuition.
3c. Accommodate a wide range of literacy and language skills.
3d. Arrange information consistent with its importance.
3e. Provide effective prompting and feedback during and after task completion.

PRINCIPLE FOUR: Perceptible Information
The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
Guidelines: 4a. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
4b. Provide adequate contrast between essential information and its surroundings.
4c. Maximize "legibility" of essential information.
4d. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
4e. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

PRINCIPLE FIVE: Tolerance for Error
The design minimizes hazards and the adverse consequences of accidental or unintended actions.
Guidelines: 5a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
5b. Provide warnings of hazards and errors.
5c. Provide fail safe features.
5d. Discourage unconscious action in tasks that require vigilance.

PRINCIPLE SIX: Low Physical Effort
The design can be used efficiently and comfortably and with a minimum of fatigue.
Guidelines: 6a. Allow user to maintain a neutral body position.
6b. Use reasonable operating forces.
6c. Minimize repetitive actions.
6d. Minimize sustained physical effort.

PRINCIPLE SEVEN: Size and Space for Approach and Use
Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.
Guidelines: 7a. Provide a clear line of sight to important elements for any seated or standing user.
7b. Make reach to all components comfortable for any seated or standing user.
7c. Accommodate variations in hand and grip size.
7d. Provide adequate space for the use of assistive devices or personal assistance.

Please note that the Principles of Universal Design address only universally usable design, while the practice of design involves more than consideration for usability. Designers must also incorporate other considerations such as economic, engineering, cultural, gender, and environmental concerns in their design processes. These Principles offer designers guidance to better integrate features that meet the needs of as many users as possible.

Incorporating these Universal Design principles within a Building Information Modeling system would seem to be an expedient way to monitor the compliance of buildings with UD guidelines. As a virtual representation of the physical and functional characteristics of a facility in digital format, a BIM model provides a resource of information about the facility to be constructed that provides a reliable basis for decisions during the facility's lifecycle from project planning onward. As such, BIM has a potential to truly integrate accessibility requirements into a project by considering them during project conception and through all of the design and construction phases of the project. There have been a number of instances where Universal Design has been integrated in some manner in BIM. A description of several of these studies follows.

Case Studies

1. *Godager (2011) examined the creation of a BIM model for an existing hospital in Norway that could be used as an integral part of the management, operation and maintenance of the hospital. One of the requirements for the model was the incorporation of Universal Design concepts. In Norway, the National Office of Building regulates Norwegian building codes. The code requires that measures are planned, designed and constructed out of concern for good visual quality, for Universal Design and so that the measures meet the technical requirements for safety, environment, health and energy. The responsible designer must prepare the necessary documentation to ensure that all requirements made in or*

pursuant to the Planning and Building Law are taken care of in the finished building.

Examples of Universal Design components include step-free entrances, lighting and marking in entrances, requirements for elevators, rooms and doors suitable for all users including those in wheelchairs and people with reduced vision. These characteristics could be incorporated into a BIM model and it would be possible to run an analysis where the various requirements could be checked in the software. Godager (2011) found that aesthetic objects and personal wishes were subjective and thus difficult to model. However, he determined that requirements for the mobility aspect of universal design would be easier to check within a model than would requirements for sight and hearing. His conclusion was that the BIM model alone could not answer all of the Universal Design compliance questions. A critical factor was the degree of available information, how it was stored and the completeness of the BIM model.

2. *Kristensen (2010) examined the use of digital rule checkers in incorporating Universal Design principles in a BIM model. Digital rule checkers have the potential to improve the efficiency and quality of the construction process by implementing automated quality tests of digital building models to determine if they are in compliance with building laws and regulations regarding energy usage, loads, universal design, reinforcement, and dimensioning. In essence, the rule checker could determine whether the Building Information Model is being built according to valid regulations and laws.*

The process would be automatically incorporated as the building was being designed. This process is accomplished by first creating a digital building code through a sequential process that translates the original rules into formalized rules, structures those formalized rules and implements the system into a rule engine including validation of the rule engine.

Kristensen (2010) found that although there are several digital rule checkers available on the market, their usability is limited due to poor documentation of their validity. However, he felt that with larger scale testing and better documentation, digital rule checking software could become a good tool for improving the building process. Universal Design might be implemented in the various phases of building a project. First, during project conception, building elements with special UD requirements should have required dimensions built into the basic design. Then, during the design phase, the architect could complete an automatic check for compliance with universal design requirements. Those building elements not in compliance could be changed. By identifying noncompliant elements early in the design process, time and money could be saved rather than making changes later in the process that would be more expensive. (Kristensen, 2010).

3. *Jrade and Valdez (2012) investigated the use of Universal Design in residential projects. They presented a methodology for integrating BIM with a database management system for use in designing universal buildings and homes. Described were the development and implementation of a BIM model*

incorporating extensive databases that stored previously created architectural components and systems based on National Building Codes of Canada (NBCC). The databases were an attempt to simplify the process of creating universal designs. The use of BIM allowed owners and engineers to design and animate a universally designed building easily and efficiently during project conceptual design. The methodology used consisted of first designing the BIM model's database with elements needed to design universal homes.

Next, the BIM tool (Revit Architecture in this application) was customized through creating new families which are data files that establish the relationships used to describe architectural objects electronically, and keynotes containing 3D elements for needed architectural components in universally designed residential homes. Finally, a module was designed to manage the selection process and retrieval of materials and products' information. The module also had the capability to execute any calculations related to the construction costs of the project. This module was linked to an external database.

The authors applied this methodology in the Universal Design of a four-story residential home, with four apartments in each floor. They concluded that the integration of Universal Design and BIM was useful because individual components and their associated stored data could be selected when needed by linking keynotes and products' specifications information. By using predefined families that met the needs and requirements for Universal Design during the design process, an effective model could be produced incorporating Universal Design

principles. The authors recommended that the construction industry begin using Universal Design guidelines in the design of new buildings not only to increase the lifespan of the buildings, but also to reduce the need for future renovation. If Universal Design were adopted at the beginning of a project, end users would not need to face renovations throughout their life changes and would ultimately be able to age in place in their households.

Future Initiatives

Building Information Modeling is a dynamic, rapidly changing and expanding system that is in the process of revolutionizing the design and construction industries. A number of future initiatives might be implemented that could catalyze the integration of Universal Design concepts within BIM models.

A guiding force in the area of Building Information Modeling is the *buildingSMART alliance*. This organization was created to spearhead technical, political, and financial support for use of advanced digital technology in the real property industry from project conception through operations and management. The buildingSMART alliance has been a strong supporter for the development of open data standards (National Institute of Building Sciences, 2014). One way that the buildingSMART alliance helps to foster the sharing and interoperability of digital information is through the creation of open source format industry foundation classes (IFCs) that allow the exchange of database information across multiple modeling formats that apply to the whole building cycle. Industry Foundation Classes (IFCs) contain data elements that

represent the parts of buildings, or elements of the process, and contain the relevant information about those parts. The International Alliance for Interoperability (IAI) is a global standards-setting organization that promotes effective means of exchanging information among all software platforms and applications in the building industry. IAI issued the first full release of its Industry Foundation Classes (IFC) Information Model in January 1997. Industry Foundation Classes specific to Universal Design requirements need to be created. This will allow the seamless inclusion of these concepts in future BIM models (Eastman et al., 2011).

Another method that could potentially be used to check BIM models for Universal Design compliance and identify errors would be the implementation of virtual gaming technology. It is now possible to "walk" through a digital BIM model in much the same way that people do in the real world. By drawing upon the virtual reality world created in many computer games, people with limitations could complete simulated walkthroughs of universally designed building models to identify design errors from a user's perspective.

Finally, although some states and local governments in the United States either have their own unique accessibility codes or have adopted the International Building Code (IBC) that references ICC/ANSI A117.1 Accessible and Usable Building s and Facilities, there is no comprehensive set of building codes that specifically addresses all Universal Design principles. Perhaps the aging baby boomer population will initiate the creation of a portion of the IBC that will be specifically dedicated to Universal Design codes for construction.

The Role of Women

Henry (2012) reported that studies on psychology and neuroscience show that women, on average, tend to be more empathetic, sympathetic and less prone to narcissistic traits than their male counter parts. These qualities along with the stature and strength limitations experienced by some women might position them to be strong proponents for the incorporation of Universal Design principles in all building design. The U.S. Department of Labor Statistics,(2010) considers careers in the construction industry to be nontraditional occupations for women. Although not specifically a requirement in the integration process, what role might women play in this greater inclusion of Universal Design principles in Building Information Modeling?

A press release from the American Institute of Architects (AIA) (2012) reported that gender and ethnic diversity continues to grow as 17% of all AIA members are female compared to 9% in 2000, and ethnic minorities now represent 10% of all AIA members compared to 7% in 2000. Henry (2012) states, "I argue that architecture would be far a more relevant and justifiable enterprise if there were more female architects. Beyond making the profession more compassionate, a greater number of female architects would be a stalwart force against pernicious ideologies that dismiss common concerns for the idealized tomorrow".

In the construction industry, women continue to make inroads into a male dominated occupation. The Center for Construction Research and Training (2012) reported that more and more women have taken managerial or professional occupations in construction. In 2010, 31.4% of women construction workers were in

management positions as compared to 15.8% in 1985. It was felt that these changes resulted from an increased demand for managerial and professional skills in the construction industry coupled with improvement in education and competency in this area among women. Women who are construction managers may be positioned in the future to provide input during design and construction to recommend that Universal Design elements be included in BIM models.

Conclusion

Building Information Modeling (BIM) will continue to evolve and streamline the way that projects are designed and built. BIM has the potential to eliminate enormous waste in the industry, resulting from the recollection and recreation of project information, data, and contract modifications, with a projected savings of $400 million, by 2020 (National Institute of Building Sciences, 2014). The aging population will, by majority, be looking for universally designed residences that will meet all of their life stage requirements and allow them to "age in place." It seems a logical progression that a digital BIM model should incorporate Universal Design principles as critical rules for efficient and sustainable construction. Some progress has been made through the use of rule checkers and creation of database families that help facilitate the design of Universal Design compliant BIM models. However, much still needs to be done.

Greater numbers of Industry Foundation Class families that include Universal Design components must be created. Both digital and virtual modalities must be incorporated to facilitate the checking of universally designed BIM models for compliance and errors. Current

building codes must be modified to include divisions specific to Universal Design. More women need to be encouraged to consider the opportunity and potential of nontraditional career choices. Thoughtful change is the foundation upon which the future of the construction industry must be built.

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Expanding ADA Design into Family-Friendly Restrooms: Case Study and Reflections

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Abstract: Women are often caring for family members of two or more generations and responsible for assisting with medical appointments out in the community. This case study examines the issues that these women face when visiting a major medical center for appointments. The author describes problems that they faced in using the lobby restrooms and a solution that lead to renovations to help visitors use the restrooms safely and comfortably.

Introduction

The Rhodes Hall main lobby of the Ohio State University Wexner Medical Center is the hub of activity and the restrooms there are often the first oasis for which weary visitors and patients look after a long drive from their far away hometowns or even nearby suburbs.

Years of people watching and helping visitors navigate within this large medical center, gave me the insight that these restrooms not only needed to be ADA compliant, but also needed to incorporate universal design features. Specifically, they needed to be designed to meet the needs of the woman caring for both the young and old.

The one situation I repeatedly observed was the extended family groups. I watched so many younger women pushing a stroller or

herding young children while at the same time keeping an elderly parent on course for an appointment or procedure. Another scenario was the grandmother caring for her grandchildren while she too was trying to get to her appointment with children in tow.

Background

The National Cancer Institute defines a caregiver as "…someone who assists another with daily needs, *such as doctor visits*, meals and medicines, or spends time with them and helps them cope with feelings." (2013) (emphasis added). Even independent older adults often rely upon family to help with transportation to and from medical appointments. In fact, 83% of family caregivers report that they either provide or arrange for transportation for older family members.

Although sons and husbands are increasingly involved, caregiving is still primarily a female occupation. Of the caregivers surveyed in 2009 by the National Alliance for Caregivers (NAC) and AARP, 67% were female who have an average age of 50 years. Daughters are more likely to provide the hands-on care such as assistance with toileting needed by mothers or mothers-in-law. At the same time, 30% of children under the age of five are cared for by a grandparent while a parent is working (NAC, 2009). These children therefore often accompany the caregiver to medical appointments during the day. Thus caregivers are often juggling the needs of two generations in the community as they try to handle medical appointments for themselves or older family members. There simply is not anyone else who can care for the child or the older adult so the caregiver makes due.

The Americans with Disabilities Act

The Americans with Disabilities Act became law in 1990 and immediately impacted the design and construction of public institutions in the United States. The Medical Center now had a new set of construction standards to follow in order to make designated areas of their built environment accessible to those with disabilities. The former facility standard under section 504 of The Rehabilitation Act (June 1977-January 1991) was UFAS (Uniform Federal Accessibility Standards). Prior to that there was no required access standard. This new law also provided a ten year window to allow facilities to bring their spaces into compliance.

Surveys to document existing building conditions of the built environment were provided by the Civil Rights Division of the U. S. Department of Justice. The in-house facility planners at the Medical Center were directed to begin the survey process to determine architectural compliance within the Medical Center. One of the first directives given was to survey the indoor public spaces where patients and visitors first arrive such as the main lobby. Public restrooms were included on this list.

As a designer, I had been to some interesting places at the Medical Center: the cardiac catherization labs, the morgue, and even rooftop mechanical spaces. Restrooms, however, somehow lacked the intrigue of these other spaces. Although this was a serious challenge, I laughed at the idea of spending time in restrooms measuring every part of the space. I joked with friends that my clients were cold (as porcelain) but quiet and didn't change the scope of the project!

Survey results

What I discovered after many restroom surveys were spaces that needed some help.

- *What we thought was the "compliant" stall did not provide the minimum five foot turnaround space for wheelchairs.*
- *Toilets were not the correct distance from side walls/stalls and were coupled with missing or incorrectly placed grab bars.*
- *Flush levers on toilets were often too high to reach and required too much force to flush.*
- *Sink hardware could not be easily operated with the use of a fist.*
- *Pipes below the sink were not installed to protect the person with little or no feeling in their legs from getting hot water burns.*
- *Even the main doors in and out of the restroom were often too heavy to operate.*

The new accessibility standards listed the proper requirements that would get these restrooms into compliance. The main challenge to the designer was to create a designated accessible stall. Two stalls would need to be combined into one large stall in order to provide the clear floor space mandated by the new standards.

Pre-construction reflections

It is great to be an in-house interior designer/facility planner at such a large institution. The diversity of projects keeps this career interesting. Projects vary in size from selecting furniture for a single office to providing layouts, fixture, furniture and equipment for a multi-story building. Often times we have come up with creative solutions using existing spaces to make them function while still

looking nice. The working environment is a living laboratory of projects.

In-house designers get to see what works and what does not. I pass by areas on a weekly basis and get to assess how they are "holding up". We get to hear what works and what does not from clients in some very informal situations, such as, while in line at the cafeteria or even while waiting for your own medical appointment. The familiarity with the environment and feedback from clients and staff gives me a reality check of my work which motivates me on future projects.

Project

One of the first set of restrooms to make compliant was located off the main lobby of the Medical Center. The women's restroom was comprised of four stalls with one of the stalls built wider for accessibility, sinks, and a vanity counter that also served as a diaper changing area. The men's restroom had two stalls, two urinals, two sinks and no diaper changing area. The floor plans show the existing conditions. (Figure 1) This renovation would be one of the early projects to comply with the new ADA standards. It would improve one of the first stops that visitors make upon arriving at the medical center and help improve their experience at the Medical Center.

Women's
S108T

S109T
Men's

Plan (Existing)

NORTH
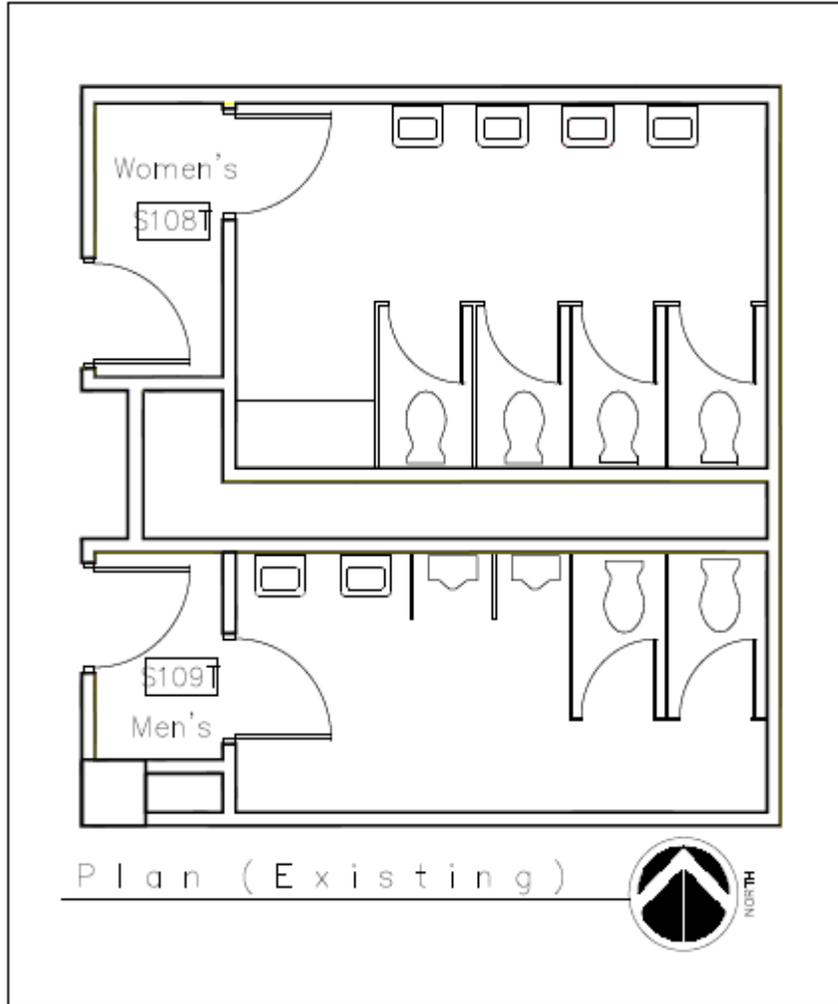
This brings me back to the reason I wanted to ensure an accessible restroom stall that went beyond the minimum standard for accessibility. How many times had I gone into a restroom only to see a woman trying to corral her family within the space. Grandma was in the stall and needed help but mom can't leave the toddler alone, or potty training that two year old while grandma waits in the restroom outside of the stall. Before this renovation, I would think, wouldn't it be great to get everyone into that stall, with their own sink, so that sandwich generation caregiver could take care of everyone? Now I had the opportunity to create that space.

Compliance Solution

The ADA solution to bringing the women's restroom up to compliance was relatively easy even with the architectural constraints of some walls. Automatic door openers were installed for the doors going into both restrooms. Walls to provide "line of sight" privacy were removed/ relocated, and the doors on those walls were removed. A toilet stall was removed which made the last stall in both restrooms the accessible stall. Using the last stall in the run allowed the accessible stall to use the full length of the restroom. (Figure 2; photo 1) The women's restroom accessible stall was now 6'-0" in width by 10'-8" in length. Minimum stall width required by ADA is 5'-0". The additional width enhanced accessibility clearances especially for those who were new to their disability. In addition, it provided extra space when multiple people were in the stall. This stall also included its own accessible sink. I felt this feature was critical to ensuring fully accessible hand washing. The placement within the stall eliminated the foot traffic interference often experienced when the accessible sink is in the main aisle of the restroom. The sink within the stall created that self-contained "bathroom unit" for those times when the caregiver woman had multiple folks to corral. Beyond ADA standards and Universal Design, it's just nice to have that type of privacy in a restroom.
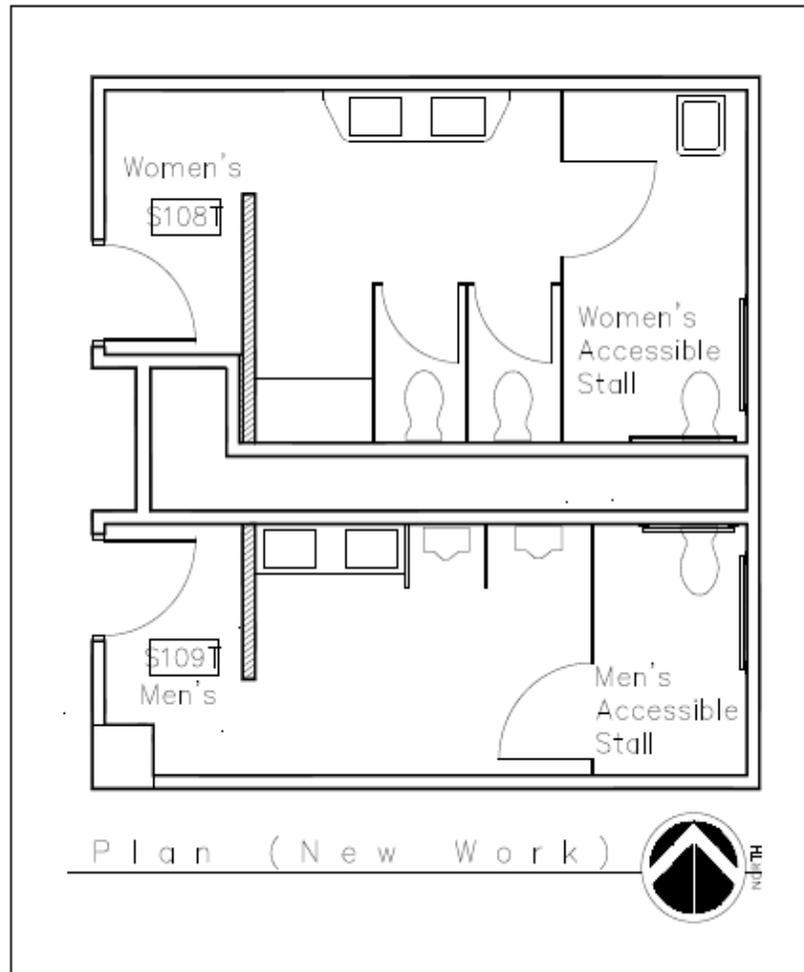
The impact of implementing Universal Design in the restrooms

- ## Father's Issues

The lobby restoration and renovation also included the men's restroom. It was similarly renovated. The needs of female caregivers prompted the same considerations for the men's restroom. There were male caregivers with similar issues especially with their older fathers. There were space constraints in the men's restroom however; the accessible stall was unable to have a sink installed within that stall, but the stall was overall longer than what was required 5'-0" wide by 7'-10". (Figure 3; Photo 2)

One of the construction managers noted that being a daddy to a baby in diapers was challenging. Many men's restrooms did not have a place to change a baby. He was happy to see this changing table installed in his own "territory".

- ## The need for family restrooms

While these renovations were helpful to caregivers, there still was a need to help caregivers who could not take an older parent of the opposite gender into the restroom. The solution which was obvious in retrospect was a family restroom in which the entire family could use the restroom in privacy. One has now been installed in the lobby of the Ohio State University James Cancer hospital.

Conclusion

Looking at the needs of women caregivers who were trying to care for both an older parent and a small child helped us to better serve all of our visitors. The use of universal design helped *everyone* who sought to use the lobby restrooms and made their experience easier and more pleasant.

One caveat: even when the best designs are installed, they can be changed later during routine maintenance. For example, when the women's restroom was recently upgraded, the diaper changing pull down table was not re-installed, but rather was placed out in the main area of the restroom. Fortunately, a visit to the restroom identified this problem and a new changing table will be re-installed soon. But these points to the problem of having everyone from designers to maintenance staff to the cleaning crew understand the importance of layout and accessible design. Ongoing continuing education on the benefits of Universal Design is critical for the future.

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DEVELOPING A WALKING AND SHOPPING CHECKLIST FOR OLDER WOMEN

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ABSTRACT: Many chronic health problems of older adults are linked to lack of exercise. Among older women, walking is a preferred means to exercising. While the neighborhood environment can play an important role in encouraging older women to exercise, it may pose barriers to walking. A checklist of environmental features was developed piloted in order to identify problems in an older historic urban neighborhood and prioritize needed improvements.

Introduction

The home is often viewed as being the domain of the wife/mother/daughter and therefore it is natural that much attention in Universal Design has been paid to the home environment and safety. This is of course important to those wishing to age-in-place and to remain in their long-time homes. But the neighborhood environment is also an important part of aging-in-place. For example, safe and pleasant walking areas are important for promoting physical activity and fitness. In addition, such areas also can assist older shoppers with running local errands as well as maintaining social ties with friends and neighbors.

In this article, the process of developing an environmental scan of neighborhood shopping hubs is described along with the preliminary

results. Today there is increased concern that older adults, especially women, are not getting adequate exercise and as a result, their health is suffering. There has been a major public health initiative to encourage older women to participate in regular exercise (CDC, Healthy People 2020, 2010) . Walking in their neighborhood provides an easy and inexpensive way to get exercise especially for women who do not have transportation to communal exercise facilities or expensive in-home equipment. But this activity requires an environment in which women feel safe and which is easy to negotiate. Applying Universal Design principles to the community environment can be an important step in this regard.

Background

Physical health: From a health standpoint, the recognition for the need for more exercise among older adults has been growing. There are many health problems which are linked to a sedentary life style such as obesity, heart disease, diabetes, and osteoarthritis (Ashe, Miller, Eng, and Noreau, 2009). And these are the diseases of older women. According to the Centers for Disease Control (CDC), 45% of women age 65 to 74 report that they are obese and among women age 75 and older, the rate is 30% (CDC, 2013). Likewise, older women are at risk of other chronic diseases. In the United States, women report more hypertension and arthritis than men and in general report high rates for heart disease and diabetes, too.(CDC, 2012) (Chart 1). This is not just a problem in North America; for example, cardiovascular disease is the number one killer of women worldwide according to the World Health Organization. The disease accounts for 46% of all the deaths of older women (WHO, 2008).

Percentage of people age 65 and over who reported having selected chronic health conditions, by sex, 2009–2010

Percent

Men ▢ Women

	Men	Women
Heart disease	37	26
Hypertension	54	57
Stroke	9	8
Asthma	10	13
Chronic bronchitis or emphysema	10	11
Any cancer	28	21
Diabetes	24	18
Arthritis	45	56
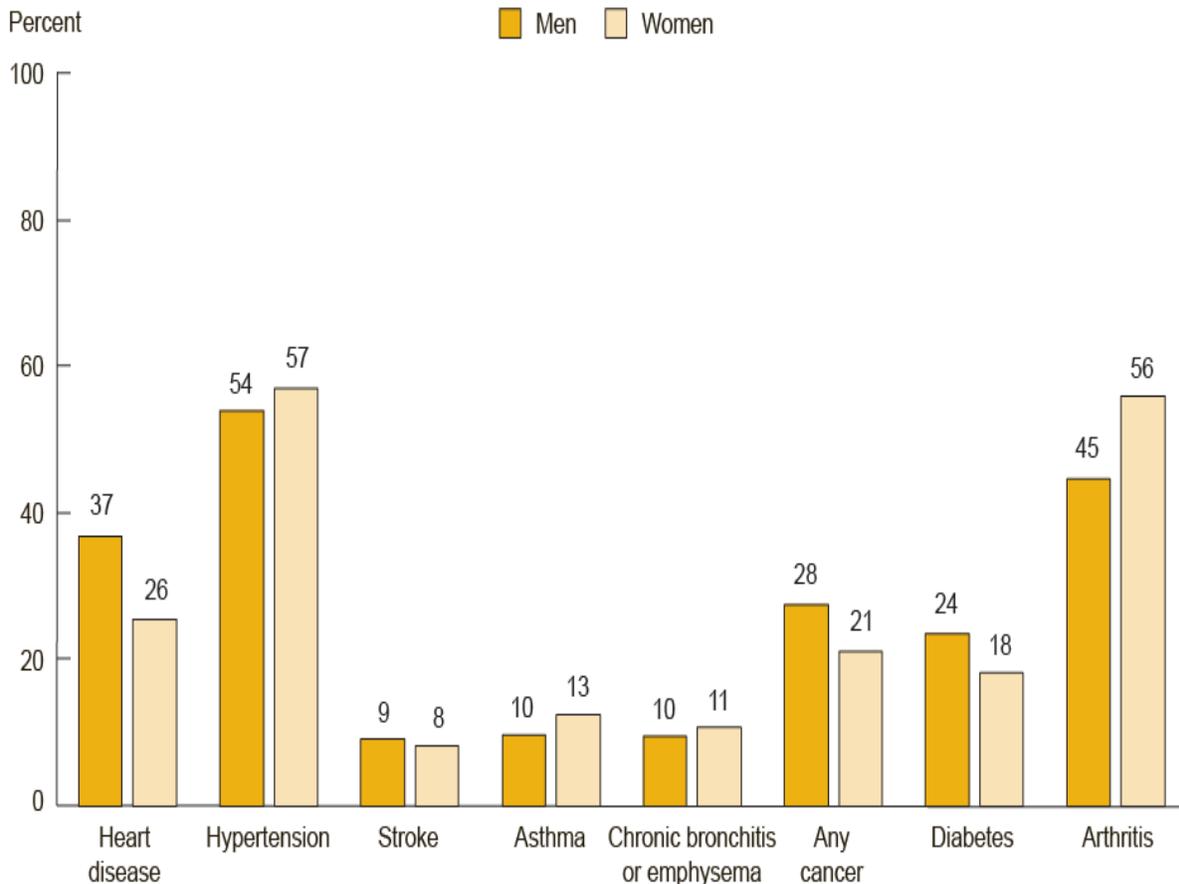
NOTE: Data are based on a 2-year average from 2009–2010.

Reference population: These data refer to the civilian noninstitutionalized population.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey.

Beyond life-threatening and chronic diseases, the lack of physical activity can have an major impact on the quality of life of older women. For example, one of the causes of incontinence among older women is a lack of physical activity (WHO, 2008, p. 30).

Mental health: **Physical activity can also play a major part in the mental and emotional health of older adults. Women are more likely than men to report depression; about 16% of all older women report**

depression compared to 11% of older men (Federal Interagency Forum on Aging-Related Statistics, 2012). Worldwide, women are twice as likely as men to report at least mild depression. According to the World Health organization, depression among women is often tied to life events such as widowhood, partly because the loss of a spouse also brings a change in living arrangements and less independent living (WHO, 2008). While there are a variety of interventions to help older women with depression, one common approach is to encourage to more exercise.

Functional health: Often we measure the functional health of older adults looking at activities of daily living such as bathing and dressing. But the instrumental activities of daily living are also important in maintaining independence and allowing an individual to remain in a long-time home. Several of these activities such as grocery shopping and travel require a safe and inviting outside environment, too. Yet we know that older adults face serious functional limitations which can impact their activities both in and outside their homes.

Women are more likely than men to report such difficulties. For example, women report more functional limitations with daily activities such as climbing stairs, bending and stooping, lifting 10 pounds, and walking 2-3 blocks than do men; almost 1/3 of all older women report some of these limitations. (Chart 2). In a vicious cycle, older women who report that they cannot walk a few blocks are therefore less likely to get the exercise that will help improve their functional health and therefore ability to walk for exercise.

Percentage of Medicare enrollees age 65 and over who are unable to perform certain physical functions, by sex, 1991 and 2009
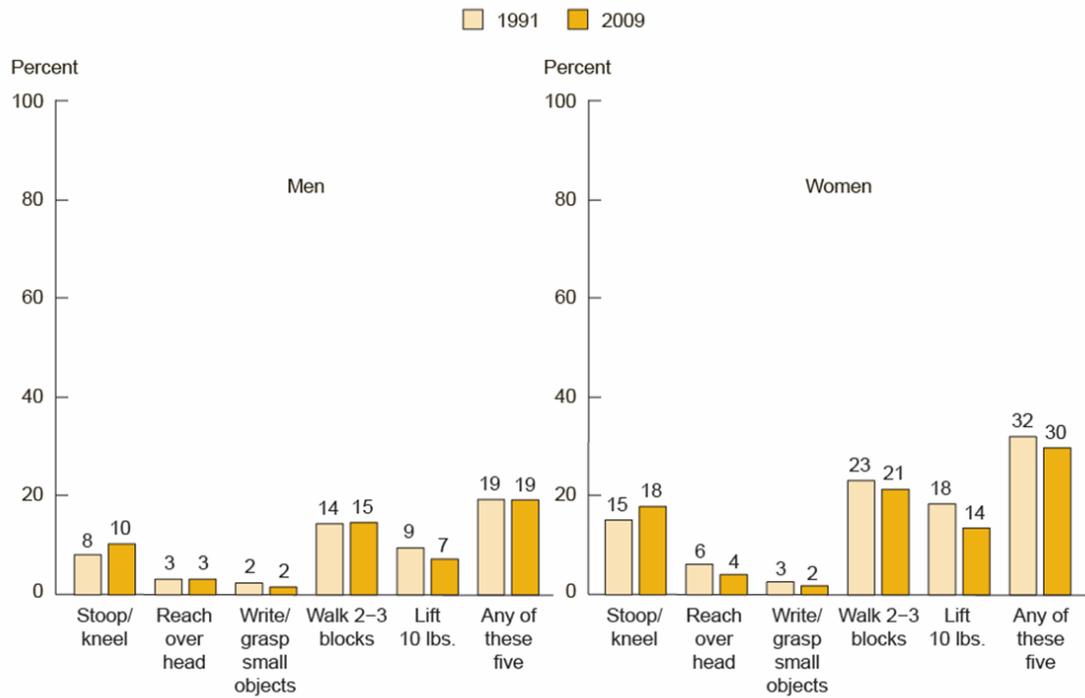
NOTE: Rates for 1991 are age-adjusted to the 2009 population.
Reference population: These data refer to Medicare enrollees.
SOURCE: Centers for Medicare and Medicaid Services, Medicare Current Beneficiary Survey.

Leisure physical activity: One significant part of a regime to improve health is incorporating physical activity into one's leisure time. Again, this is a public health problem for Americans at all ages, but especially for those age 65 and older (Ham, S., Kruger, J., and Tudor-Locke, C., 2009; Hoebner, C., Brennan Ramirez, L., Elliott, M., Handy, S., and Brownson, R., 2005). In fact, almost 32% of all older adults report no leisure physical activity in the past month. (CDC, BRFSS, 2004) and these percentages only increase for those over 75. The pattern is also apparent among those adults age 45-64, many of whom report little or no leisure physical activity. Again, this is not just a problem in North America, but rather is global. "For ageing women, even those who are older, exercise is an important

preventive activity against all major musculoskeletal conditions´ (WHO, 2008, p. 29). Again, having a safe and convenient outdoors environment can encourage more leisure physical activities for all ages.

But falls and the fear of falling are two major barriers to exercise especially for women. As Kane and Kane point out, "falls represent a serious threat to older persons." (2000, p. 58). Women who are age 75 and older are at the highest risk of falling. Generally it is assumed that about 1/3 of all older adults have a serious fall that requires medical attention each year. The outcomes of these falls are well-known: falls are the leading cause of injury among older adults, most fractures are caused by falls, and those fallers who are older are more likely to spend at least one year in a long-term care facility following the fall (CDC, 2013). Because of the frailty of older fallers, much of the research has focused on the home environment and the removal of hazards such as scatter rugs, extension cords, and clutter. Actually, there has been little research on the location of falls. However, a recent study in Boston, asked older adults where they had fallen. Among those who report falling outside, the majority of persons reported that they were walking and walking in fact with a fast gait—perhaps even for physical exercise! They were also more likely to report that they fell in an unfamiliar setting rather than in their own neighborhood (Kelsey, 2012, p. 2153). This suggests that they know their own community and areas within it that are safer for walking, but that when they venture beyond the familiar, they encounter more difficulties.

Physical environment: A final barrier to walking is the physical environment itself and therefore the subject of this research. Some of the newer communities are built in such a way as to make walking difficult or almost impossible. According to WHO, urban sprawl further discourages physical activity (WHO, 2013). Not only are important destinations such as grocery stores located on busy multi-line streets with heavy traffic, but they are scattered among other land uses. Therefore there are often long distances between these destinations which encourages persons to use automobiles for transportation rather than walking. In addition, such environments may lack sidewalks altogether so that anyone seeking to walk in the area needs to either walk on an uneven weedy, grassy area or in the roadway. Neither is a safe or inviting route for walkers.

In summary, older women face a variety of serious health problems which could be addressed in part by increased physical activity and exercise. In fact, older adults report that walking is one of their primary forms of exercise (Ham et. al., 2009). Yet the danger of falls and the fear of falling may keep them from walking even in their own neighborhoods. Few environmental scans of urban areas have focused on the needs of older adults who are walking for exercise, shopping, visiting, or to reach mass transit. Even the walk-able neighborhoods movement has not addressed the needs of an older population. The need to address the specific concerns of older adults especially women in evaluating outdoor neighborhood environments is important for city planners, public health professionals, occupational therapist, and neighborhood advocates.

Project

Focus group: **This project developed a walking and shopping checklist specifically for older urban neighborhoods. A first step was to convene a focus group of older residents in one historic urban neighborhood which is currently working to encourage and support its older residents. With its residential and commercial mix, it is also a popular tourist destination within the city with a variety of shops and restaurants that attract visitors and tours alike.**

Following IRB approval, university researchers met with a small group of long-time residents and the city's neighborhood liaison to discuss barriers and problems with walking in the area. Researchers identified 11 retail hubs with shopping and restaurants which might attract residents as well as visitors. They posted photographs of these neighborhood intersections showing streets, sidewalks, benches, signage and local businesses in the meeting space and asked the focus group members to view them and make comments on what was attractive and what were barriers to going to these locations. Among the concerns that residents voiced were condition of sidewalks, lighting, traffic and parking, and obstacles such as overgrown bushes, low tree limbs, and lack of curb cuts.

Methodology

Building on the prior work on walkable communities and environmental scans (Keast, Carlson, Chapman, and Michael, 2010; McCormack, Giles-Corti, and Bulsara, 2008; Michael, Green, and Farquhar, 2006; Day, Boarnet, Alfonzo, and Forsyth, 2006); Cunningham, Michael, Farquhar, and Lapidus, 2005), an environmental checklist was developed. Special attention was paid

to the condition of sidewalks which can have an impact on walking (Suminski, Heinrich, Poston, Hyder, and Pyle, 2007). The checklist primarily focused on safety for older adults . (Table 1). Observers were to identify items that existed at each intersection and then to rate the retail hub overall in each of five areas. Items were rated on a scale of 0= poor to 4=good with items related to safety more heavily weighted than others. There were a possible 32 points for each location with higher scores indicating better and safer environments.

Content area	Items on checklist	Scoring
Sidewalks	• slope • materials • curb cuts • condition • obstructions	0-4
Street life	• benches • buffer zones • signage • trees • litter	0-12
Personal safety	• street lights • crosswalks • bus stops	0-10
Traffic	• number of cars in 2 minutes • speed limit • number of lanes of traffic • calming devices such as speed bumps and bike lanes	0-4
Destinations	• location of parking nearby • loading zones for drop-off	0-2
Total		32

Table 1: Survey content and items on environmental checklist

Teams of masters' level occupational therapy students were trained on using the checklists. They were then given clipboards with the checklist, neighborhood maps, and tape measures to measure width of sidewalks and distance of crosswalks. They visited the 11 retail hubs on foot. Visits were conducted on a weekend afternoon, early evening on a weekday, and lunchtime on a weekday. Students reported back to a central location for discussion after the observations.

Findings

Overall, although not asked to rate the general attractiveness of the areas and how inviting they might be to visit, the observers commented that the retail hubs with their brick sidewalks, red brick buildings, historic features, and the close proximity between residences and the retail hubs made the areas attractive and pleasant . But in looking at the specific details of these environments for older walkers, they scored the retail hubs from 11 to 19 out of possible 32 points.

Of the items that received the lowest ratings were those on the condition of sidewalks and benches, height of curbs, lack of buffer zones between sidewalk and street, and the ability to cross the street safely due to lack of traffic lights and crosswalks. Observers who visited the locations in the early evening generally gave lower ratings to the lighting on the streets even noting that street lights did not come on until after dark rather than at dusk. Items that were rated more highly were signage, lack of litter, condition of trees and plantings, speed of traffic and width of streets, and nearby parking.

Discussion

Attractive, safe areas with shopping or social destinations can encourage walking rather than using the automobile for short local trips. This in turn can offer opportunities for exercise that will help to improve physical and even mental health status for older women. Given the need to increase the low number of older women who report any leisure time physical activity and the growing number of chronic health concerns of older women, one strategy is to identify problems areas in the nearby neighborhood environment that act as barriers to walking for exercise. The development of easy to use checklists to rate these environments is one first step.

Earlier checklists were observational, noting the location and condition of various items. They were helpful for identifying problem areas that needed neighborhood and city attention in order to make them safer and easier for older adults to use. But they also were not tested in historic urban neighborhoods where retail establishments and restaurants are often excused from compliance with the Americans with Disabilities Act (ADA) requirements. Here the city and the neighborhood work hard to keep the historic character of the area in place with a local commission which reviews any proposed changes of the exterior of buildings. Although this project did not address doorway access to these buildings and inside access to restrooms, in the focus group there was discussion about avoiding certain restaurants and retail stores. Focus group members said it was so difficult to enter these buildings if one used a wheelchair or walker and especially to use the bathrooms which were small and not handicapped accessible. These are additional problems that need to be addressed by future studies.

This was the first checklist which asked the observers to rate the environments with a numerical score. The purpose was to identify those retail hubs which needed attention immediately to improve their safety for older adults. But the scores varied by individual teams and by time of day. For example, those who visited in the day time did not rate the lighting yet this is an important safety item for walkers. Given the time of year, observers did not have a chance to see the extent of snow and ice removal which certainly will influence the safety of walking. Likewise, some sidewalk obstacles such as tables and chairs were not always present when the observers visited which may have changed their overall scores. Better training of observers should improve inter-rater reliability. Terms such as buffer zone need to be better defined. Likewise, better specification about the exact location might help with identifying exactly which items should be included; for example, is the light post on the other side of the street included in the observation?

Several items might be eliminated from the checklist. For example, observers were asked to note whether there was a bus stop nearby and hubs lost points if there was not a bus stop there. But often there was a bus stop within a block that was not noted. So availability of public transit needs to be identified using another method. Likewise, the location of bike lanes may not be useful in determining the walkability of an area. Finally, a key consideration in urban environment that would help to promote walking is lack of street crime (Quinn, 2008; Krenichyn, 2006) and this checklist does not address this aspect. We cannot expect older women to walk for exercise if they are concerned about muggings and robberies no matter how smooth and safe the sidewalks are. Certainly they will avoid poorly lit areas after dark as well as overgrown, unkempt, and

graffiti-filled areas which are signs that the area is not safe. Walking areas that are not visible from the street may also be deemed to be unsafe. Future research should address these concerns.

Limitations

This study was conducted in the early autumn when weather-related conditions were not a problem for walkers. It was conducted in an older historic neighborhood where historic features such as brick sidewalks are prized and encouraged; this checklist should be tested in other urban areas including those that were developed more recently and in suburban areas where the majority of older adults now live. The rating system needs to be improved to provide more guidance to the observers as to how to rate the various aspects of the physical environment. This will improve the consistency of results. The survey might also be improved by seeking to encounter and question older women who were walking in the area as well as convening additional focus groups to hear a wider variety of views. Efforts to reach older visitors might also provide insights from those who are not overly familiar with the neighborhood and who are possibly encountering it for the first time.

Conclusion

Given the priority for increasing the amount of exercise which older women get on a regular basis and their preference for walking as part of any exercise regime, it is important that they have safe and pleasant nearby areas in which they can walk. City planners, public health and healthcare professionals, and neighborhood advocates should work together to identify and remove barriers to walking

locally. Such changes would help to encourage older women to feel comfortable leaving their homes and venturing out for exercise and therefore improvement of their health. The development of local walking clubs would encourage walking as exercise and as a leisure activity. Likewise, better walking environments will promote leaving the automobile in the garage and walking for shopping errands and to visit local entertainment and dinning establishments. All of these can be strategies to improve the overall health of older women living in the urban neighborhoods.

Acknowledgements

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Environmental Shopping Preferences of Older Female Consumers

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Abstract: **Shopping is an important activity for older women as they need to purchase food, household goods, and apparel as well as gifts for others. Yet many find the shopping environment difficult to navigate and use. This article reports on a qualitative study of independent living older women and their concerns about shopping. Author suggests incorporation of Universal Design to make environments more welcoming for older shoppers.**

Introduction :

The exercise of shopping may be defined as an Independent Activity of Daily Living (IADL). In women, especially, shopping is an important part of daily life whether it is while purchasing food, household goods, or apparel for themselves or other people, such as family members and friends. Thus, shopping is a fundamental and essential *need* and value to being and remaining self – sufficient or independent as we age. Shopping visits are necessary in terms of purchasing food, medication, and clothing (Gebreyohannis & Kharel, 2012). In addition, it also improves the overall quality of life and well – being because an individual may feel more independent when making these purchases unaided.

Contrary to popular belief, the female elderly population in the United States actually enjoys shopping and also has the substantial

financial means to spend on apparel goods (Moye & Giddings, 2002). By 2020, 16.1% of the U.S. population will be age 65 and older (U.S. Census Bureau, 2008). In 2012, those aged 65 and older spent an average of $39,687 per year including $ 1,510 on apparel– only somewhat less than the $2,491 spent by those under age 65 on apparel. In addition, older shoppers spent another average $5,175 on food outside the home (U.S. Bureau of Labor Statistics, 2013) presumably at restaurants which are often located in shopping areas. Thus older women have the resources and the desire to visit and use shopping areas. But what barriers exist that might make retail shopping more difficult for the older shopper and therefore discourage shopping trips?

Purpose and Objectives

The purpose of this study is to provide apparel retailers with information on how they can create a Universally - Designed retail environment, in order to effectively cater to the cognitive and functional needs of older shoppers. Universal Design advocates that environments are accessible to everyone, despite any cognitive or functional personal bodily limitations. According to Null (1989), a Universally – Designed environment is accessible and aesthetically – pleasing to people of all ages.

In this particular study, the researchers specifically evaluated and interpreted the physical design of *apparel* retail stores. They explored and analyzed which environmental store Universal Design features were more preferred to older adults while shopping for clothing, in particular.

The objectives were to qualitatively explore what design features (such as, value contrast, no pattern, focal point, continuous floor material, open spaces between fixtures on the selling floor, and wide aisles) are preferred and not preferred in an apparel retail store environment. These features can be organized into three categories: Spatial Organization, Strategic Focal Point, and Optimal Visibility. (see Table 1)

Table . Characteristics of Universal Design in Retail Settings

Universal Design categories	Universal Design　　　No Universal Design
Optimal Visibility Contrasted, warm-colored and dimensional signage created with simple type fonts (Ruderman & Ruderman, 1992) "Redundant cueing" or presenting a message more than once (Hunt, 1991 Avoid using two-dimensional patterns (Day, Carreon & Stump, 2000)	Value contrast　　　/　　　No value contrast No pattern in background surfaces /Patterned background
Strategic Focal Point Created by size or arrangement of items; symmetrical balance (Allen & Stimpson, 1992) Objects should be placed at eye level to create emphasis or a central focal point (Hiatt, 1991)	Obvious focal points / No focal point Continuous floor material / Multiple floor materials

Spatial Oganization Eliminate over stimulation of sensories (Day & Calkins, 2002) by spacing out merchandise on fixtures At least a 3' x 3' turning space should be available (U.S. Small Business Administration & U.S. Department of Justice, 1999) Clutter should not be placed in open spaces (U.S. Small Business Administration & U.S. Department of Justice, 1999) Aisles should ideally be at least 36" wide (U.S. Small Business Administration & U.S. Department of Justice, 1999); 48" for two people to pass through comfortably	Open spaces between fixtures / No open spaces Wide aisles / No wide aisles

The objective in this particular study was to qualitatively discuss and inform which features are most important and a priority when designing an apparel retail store, when specifically targeting an older female demographic population. These design features were studied through open-ended questions and responses completed by the research participants.

Review of Literature

A major component of aging successfully includes the capacity of taking care of one's self, both physically and mentally. Thus, this includes the physical and cognitive competencies to function independently in life's daily activities. One of the competencies that Rowe and Kahn (1998) discussed was "maintaining high mental and physical function" (p. 29) while growing older. Over time, our

abilities to perform daily activities do decrease. They explained that there is in fact a "steady decline" (p. 100) in physical abilities. These bodily changes in abilities can be measured and analyzed by the Instrumental Activity of Daily Living (IADL). Examples of IADLs include running errands and shopping as well as using the telephone, meal preparation, housework, and handling money (Gebreyohannis & Kharel, 2012).   If an individual is unable to perform or function successfully in IADLS, she must rely on other people, thus giving up one's own independence. This can be both frustrating and saddening for the aging individual.

Rowe and Kahn suggested that an environment (such as a shopping environment in this case) could be enhanced to increase "people's ability to function in later life" (p. xii). This current study provides one solution for this problem that can help combat these personal frustrations.   According to Kozar-Westman, Troutman-Jordan, & Nies (2013), "...successful aging is framed from the older adult's perspective of aging" (p. 239). Thus, perhaps feeling that one is strong enough to shop independently, may encourage these feelings of comfortable experiences, which in turn are felt through approach behaviors or wanting to remain and/or return to a retail store.

Another aspect of successful aging that pertains to shopping is social connectedness (Toepoel, 2012). In fact, the presence of social isolation in older adults is a major problem (Bartlett, Warburton, Lui, Peach, & Carroll, 2013). Shopping activities not only are a means of acquiring clothing for oneself and others but shopping activity also helps in combatting social isolation. Toepel (2012) resolved that "...leisure activities explain a significant part of

older people's social connectedness" (p. 355). Toepel also suggested that "leisure activities and social integration needs to be further explored in order to get a better understanding of how leisure activities can stimulate social integration" (p. 370-371). In fact, studying the relationship between older adults and apparel shopping is one means to exploring this issue. Hsiao (2009) suggested that shopping is not only a means for purchasing items, it is also a means for social engagement. In other words, while shopping, customers are engaging with other human beings, which are useful in preventing loneliness, and thus aging successfully when relating back to older adults.

As retailers present their store merchandising selection to appeal to older shoppers, they should consider the changing components and factors that we all face during the aging process. This way, their customers will be in a comfortable and approachable environment, and continue to be independent while shopping and engaging in this form of social interaction. Consumers will be comfortable and may even become repeat customers, thus becoming loyal to a particular store. Retailers can fulfill fundamental needs of their customers by listening to their concerns and then creating an environment that will be attractive and inviting, from both a beautification approach and a complacent environment that targets specific needs.

Creating approachable environments relates back to Approach-Avoidance theory. According to this theory (Mehrabian & Russell, 1974), purchasing behavior is based on a person's preference to approach a shopping environment. Donovan & Rossiter (1982) indicated that feeling "active" leads to approach behaviors. If a

retailer successfully merchandises a store in order to accommodate the needs of older adults, a customer will most likely have a good experience and engage in approach behaviors rather than avoidance behaviors. In other words, the customer may make a purchase and be more likely to return again!

In summary, Kozar-Westman, Troutman-Jordan, & Nies (2013) stated, "In the United States alone, the older population of 2030 is expected to be more than double that of 2000" (p. 238). Likewise, globally the population of those age 65 and older will increase by 23 million by 2018 and much of that growth will come in the developing world (Kinsella and Wan, 2009, p, 7) For example, by 2040, the older populations in China will increase by 209% and in India by 274%. By 2018, 18% of the population in South Korea will be age 65 or older and by 2026, 14% of the Chinese population will be age 65 and older (Kinsella and Wan, 2009, p.14). Thus, it is advantageous for retailers not just in the United States and Western Europe, but also all over the world to create an accommodating experience for older shoppers, which will result in positive experiences.

Data Collection and Procedure

The women in this study were recruited from nine senior residential communities and five senior centers. This included those from surrounding affluent suburbs as well as the central city. The median age of the population was 81, and the mean age was 79. Most of the sample (56%) was between the ages of 80-99 years old and also college – educated (53.2%). Many of these women shopped once a month or more often (42.9%), and over half shopped alone (57.9%). It is interesting to point out that while

29.4% of the sample reported that they shopped once a month, another 11.9% reported that they shopped once a week.

Research Questions

The two overall research questions in this qualitative study were:

1. *What features in an apparel retail shopping environment may elicit avoidance behaviors?*
2. *What features in an apparel retail shopping environment may elicit approach behaviors?*

In order to analyze these precise research questions, qualitative data collection was accumulated through descriptive open – ended questions resulting in written statements responding to the survey at hand. These questions from the questionnaire are as follows:

1. *What are your biggest problems during in-store apparel shopping?*
2. *When you enter a store, what overwhelms you?*
3. *What physical characteristics of the store interiors would influence you to want to spend more time there?*
4. *Does the layout of a store impact your shopping activities? If yes, how?*

All four questions asked to the research population were used to investigate which design features would influence approach and avoidance behaviors (Mehrabian & Russell, 1974) when entering apparel store.

The qualitative findings of the first two questions asked on the survey were categorized into two categories, "Retail Environment" and "Retail Non-Environment". In this study, "Retail Environment"

included the following design features, "spatial configuration, seating, way finding, displays, lighting, and ambience", while, "Retail Non-Environment", included the following features, "salesperson, fashion styles, diversity in choices, pricing, quality, fit of the clothing, crowds, and other".   After analysis, the responses were organized according to apparent themes and placed under corresponding categories.   These charts then reflected areas of concern amongst this consumer population.   The analysis revealed that "Spatial configuration" (18.7%) was an area of most concern in the "Retail Environment". The analysis revealed that "Fit" (29.0%) of a garment was a dominating issue in the "Retail Non-Environment". Therefore, if retailers focus their merchandising and design efforts on these two attributes, customers might exhibit more approach behaviors and even return and become loyal to their stores.

Further analysis of question 2 on factors that overwhelm the shopper, looking at both "Retail Environmental" factors and "Retail Non-Environmental" factors, showed that participants were more concerned about the physical store environment than any non-environmental factors. At their age, this may have to do with mobility and how well one can physically perform or function independently in a store environment. Spatial configuration (60%) again was a key component, in these findings. Table 2 shows a breakdown of the key factors and their components in the retail environment as identified by the older women shoppers.

Themes	Spatial Configuration	Seating	Way finding	Displays	Lighting	Ambience
	Accessibility	Availability of seating	Signage	Racks	Amount of lighting	Color
	Merchandise Organization		Locating items	Aesthetic displays		Smell
	Product density		Locating sizing	Coordinated displays		Cleanliness
	Placement of clothing			Decorative displays		Relaxing atmosphere
	Order			Nature of displays		Music
	Store layout					Mirrors
	Open floor space					
	Spatial organization					
	Separate senior areas					
	Aisles					

Table 2: Themes of retail environment features

Table 3 identifies the key themes in the non-retail environment for older women who shopped and their components.

Place Table 3 here

Themes	Salesperson	Styles	Diversity in choices	Pricing	Quality	Fit	Crowds	Other
	Help	Clothing styles	Variety	Sales	Quality of clothing	Sizing	Shopper density	Other
	Finding salesperson					Trying on clothes		

Table 3: Themes of non-retail environment features

The findings of the third question on about wanting to spend more time there and question 4 on store layout revealed that spatial configuration (30.5%) was again a main area of concern. The next largest concern was lighting (21.9%). Below are some responses to open-ended questions in relation to questions 3 and 4 (see Table 4),

These responses were organized according to theme and placed in relating categories. In relation to clutter, one participant stated, "makes it look like a rummage sale", while another indicated that "filled racks" make her feel "claustrophobic". Another response indicated, "I find myself getting tired more quickly in a store crammed with too much merchandise", and another stated, "too much clutter is confusing". In summary, too much clutter present in a store space is discouraging and influences avoidance behaviors. Below are additional written comments from research participants regarding retail environments in general, and more specific questions as listed.

General Comments about shopping experience:	I enjoy shopping when clothes are well displayed and out in the open so you can shop more easily.
	I like the feeling of openness and extra space.
	Wider aisle, do not feel as if the racks of clothes are crowding the customer.
	Like the uncluttered look.
	Really don't like the idea of something in front of steps.
	More room to look.
	Throw rug: may trip over it, or can't use walker.
	May trip over different flooring.
	I like the department signs so we do not need to search.
	Cleared aisle.
When you enter a store, what overwhelms you? Why?	Size. Too big.
	Where are things? Waste of time to wander around.
	Crowds.
	No signs- cannot find items. Jumble- distracting.
	People spraying you with perfume – don't like that.
	Too much stuff.
	Too much merchandise. Crowdedness. Overwhelming. Too many lights.
	Too much clutter and crowded aisles.
	So large. Hard to find anything.
	Clutter. Like everything neat and in order.

When asked, "What physical characteristics of the store interiors would influence you to want to spend more time there?	Better Wayfinding.
	Selection and placement of clothing.
	Friendliness and merchandise not too thick.
	Separate senior clothing areas.
	Place to sit down and have coffee.
	A few more places to sit or rest.
	Clear and clean store.
	Neatness
	Clean, nice, polite workers.
	Neat, well-organized.
Does the layout of a store impact your shopping activities? If yes, how?	Clean, well-arranged.
	Must be easy to get around in.
	Must accommodate walker.
	Need to know if the department I'm looking for is near an elevator.
	Ease of finding merchandise.
	More accessible.
	Want clear arrangement.
	Displays.
	Neat displays.
	I go where I can go in/out quickly – "ready" salespeople and checkout places.

Table 4: Information gathered from comments of the research participants on shopping experience

Results

Spatial configuration was revealed to be the most important design characteristic, or most preferred, when catering to older women customers and their needs. Key words and themes, derived from "Spatial configuration", such as "general visual information" and "ambulatory design" are terms that should get much consideration when designing an apparel store environment. However, other design characteristics, Strategic Focal Point, and Optimal Visibility, were also of importance. An example of a retail space (cluttered vs. uncluttered) is found in Table 1.

Older shoppers definitely prefer a clean, uncluttered, and open shopping environment with easy to read signage. Time may also be of the essence to an older shopper; as one shopper said she likes to go where she can go in and out quickly. Older shoppers may tire more easily and therefore do not want to spend time browsing or searching for merchandise. Knowledgeable and considerable retail staff can therefore be helpful in making the shopping trip shorter.

Discussions and Recommendations

Older women have the resources to shop and the interest. Indeed, if the shopping environment were more welcoming for them, they might well spend as much as younger consumers. Therefore, consideration of their needs would be an important step forward for retailers especially in the apparel field.

Below is a prioritized list of store merchandising and design recommendations that can be used as a helpful instrument when retail merchandisers are organizing and planning their stores, in order to create an approachable environment for the older shopper. These design features should all be integrated into retail environments in order to create a comfortable and complacent space for aging customers. However, if retailers are only able to focus on one design feature, this study resolved that spatial consideration is of greatest significance. In conclusion, by creating a well – staged and merchandised spatial area, active older customers will be able to maintain their independence while shopping, thus making them more likely to enter a store, to purchase merchandise, and to return in the future.

Store design features	Recommendations to provide better retail design
Wide aisles	• Provide <u>general visual information</u> about merchandise or object. • Use 36 inches <u>wide</u> aisles. • Keep aisles <u>free of obstruction</u> customers with ambulatory issues.
Open spaces between fixtures on the selling floor	• Provide <u>general visual information</u> about merchandise or object. • Keep sales floor <u>open</u> and <u>free of obstruction</u> (3 feet by 3 feet turning space). • <u>Easy access</u> for customers with <u>ambulatory</u> issues. • <u>Organize</u> clothing departments into separate sections on the sales floor. • Provide <u>visible</u> and <u>reachable</u> merchandise fixtures.
Focal point	• Provide <u>specific visual information</u> about merchandise or object. • Provide <u>direction</u> and <u>lead</u> the customer to a clothing department or location in the store. • Draw attention to a garment, fixture, or signage by creating <u>emphasis</u> and <u>definition</u> through value <u>contrast,</u> arrangement or size of the merchandise or object. • <u>Identify</u> areas of sales floor through <u>accentuating</u> and <u>detailing</u> merchandise or object.
Value contrast	• Create <u>aesthetically-pleasing</u> merchandise displays. • Use color or value <u>contrast</u> to <u>define</u> and provide <u>direction</u> to merchandise and objects. • Provide <u>detail</u> to text so that it is easy to <u>see</u>, <u>interpret</u> and <u>comprehend</u>.
No pattern	• Create <u>aesthetically-pleasing</u> merchandise displays. • Use <u>solid</u> backgrounds on walls, flooring, signage, and display tables to provide <u>less stimuli and distraction.</u>
Continuous floor material	• Keep the flooring texture and color <u>consistent</u> and <u>clutter-free</u>. • Provide <u>specific visual information</u> about merchandise or object. • Provide <u>direction</u> and <u>lead</u> the customer to a clothing department or location in the store.

Table 5: Prioritized list of recommendations for retailers when designing an apparel retail store

LIMITATIONS

The aim of this study was limited to women, ages 55 and older, residing in senior residential communities, such as independent living facilities, and/or those active in senior social groups and activities. This study only focused on those individuals living in a Midwestern city. Furthermore, this study did not include individuals living in assisted living facilities as they may be less active and need more physical help from others while participating in regular activities of brick-and- mortar shopping experiences.

CONCLUSION:

Given the financial resources that older women have and their interest in purchasing apparel for themselves and for others, retailers should consider how inviting and comfortable their shopping environments are for these older consumers. Fortunately the changes suggested in this article will enhance the shopping environment and experience of women of all ages. So these suggestions could benefit many shoppers and encourage more consumers to visit these retail outlets and make purchases.

The nature of shopping is changing in many ways. While the physical environment of a store is important and will continue to be so because many consumers enjoy the experience of browsing and interacting with sales staff. But the number of shoppers who are using the Internet for shopping continues to grow each year (Rueter, 2012). This number may include older women who cannot easily go out to a shopping area and to brick and mortar stores or who do not feel comfortable in specific stores. This trend has ramifications for retailers across the globe. Again, it seems unlikely

that all or even the majority of shopping will be done on-line, but this is another option for the older women who is interested in making purchases. The impact of this option remains to be seen.

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Megan G. Pace, PhD

Margaret H. Teaford, PhD

Susan L. Zavotka, PhD,

BOOK RECEIVED:

Warm Greetings!

access ability

I am very excited and happy to share my upcoming novel 'No Looking Back', a memoir based on my life experiences. I hope you have the time to read it and share your thoughts with me! Look forward.

What happens when your life is turned upside down in the blink of an eye?

Twenty-two-year-old Shivani had thrown a party one evening and awoken the next morning in hospital, her spine and her dreams shattered by a car crash. Paralysed and then wheelchair-bound, it took Shivani years of pain, struggle and determination to regain control of her life and her body, to demand and receive respect from the world, to gain acceptance from within and without, to find love and happiness. Then tragedy struck again. As the newly married Shivani drove to Manali with her family, an oil tanker collided head-on with the car, bedridden once again, she watched helplessly as first her father-in-law and then Vikas, her husband, succumbed to their injuries. And yet, Shivani refused to surrender she would not let her inability to walk keep her from achieving her ambitions.
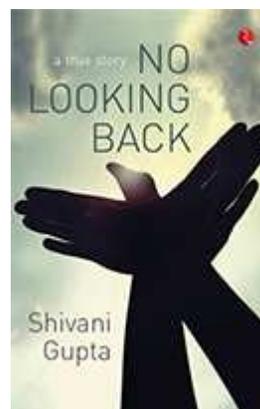
NO LOOKING BACK
A TRUE STORY (PAPERBACK)

No Looking Back is a deeply moving and inspiring narrative about surviving the challenges of disability in a country that takes little account of the daily difficulties and indignities faced by approximately fifteen per cent of the worlds population, whether in terms of infrastructure, legislation or awareness - a country that appears to believe that disability equals invisibility from the public discourse. Undeterred by the hand fate had dealt her, Shivani Gupta has chosen to champion the cause of the disabled everywhere and is today one of Indias best-known accessibility consultants. Her life is an extraordinary testament to true courage and the indomitability of the human spirit in the face of overwhelming odds.

The book can be ordered online from **Flipkart** and **Amazon**

A New eBook from UniversalDesign.com

Universal Design Tips: Lessons Learned from Two UD Homes

This new electronic book from UniversalDesign.com is filled with tips and ideas that will help guide anyone through the process of designing and constructing their own Universally Designed home. The book was co-authored by John Salmen, AIA, the publisher of *Universal Design News* and founder of UniversalDesign.com, and Ron Knecht, whose durable, energy efficient Universally Designed house was featured in the January 2012 issue of *Universal Design News.*

The first section of the book deals with the planning process, providing insight on how to choose a location for the house, consider activities of daily living during planning, best use various types of design professionals, finalize a floor plan and develop a building schedule.

The rest of the book is organized according to different areas or elements of the home (i.e. exterior doors, bathing, and kitchen counters, just to name a few.) Whether designing a whole house or simply remodeling one area, *Universal Design Tips* makes it easy to quickly refer to the relevant section and find valuable tips that ensure success. Each of these sections includes design tips, photos and important lessons that the two authors learned through their personal projects.

John Salmen has been working in the field of accessible architecture and Universal Design for over 30 years, and he put this expertise to good use when remodeling a historic property to create the Universally Designed house he and his wife hope to live in for many years. Salmen's "Home for the Next 50 Years" has been featured in various media outlets: including *The Washington Post*, *Fine Homebuilding*, AARP's television show *Inside E Street* and the book *The Accessible Home: Designing for All Ages and Abilities*. Now, readers will be able to explore Salmen's home in even greater detail and apply his experience to their own Universally Designed home projects.

Ron Knecht's experience with Universal Design started after his wife of 46 years became ill with cancer. As her health worsened, Knecht learned first-hand the importance of accessibility for maintaining independence, safety and one's quality of life. Before Knecht's wife passed away, she extracted a promise from him that he would move to a Universally Designed house located closer to their daughter. Knecht was underwhelmed by both the houses that he saw on the market and the UD house plans that he found online; he realized that he would have to plan and build a custom house in order to fulfill his promise.

Knecht and Salmen were mutually impressed with the thoughtful Universal Design details present in each other's homes, and eventually they decided to co-author a book that would draw from their experiences to provide guidance for anyone planning to build or remodel their home for enhanced safety, comfort, independence, convenience and aging in place.

The eBook is available from UniversalDesign.com as a downloadable PDF, for $20. A short excerpt of the book is also available for preview prior to purchase. To buy the eBook or view the preview visit **UniversalDesign.com**.

Universal Design Tips
Lessons Learned from Two UD Homes

By Ron Knecht & John Salmen, AIA

3.

INDEX

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THE FOOD SERVICE AT THE VILLORESI EST REST AREA

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WORKING AT THE VILLORESI EST REST AREA
-

This book was born as a result of a partnership with Autogrill , which , for the new facility " Villoresi East " , has developed an innovative project -oriented Design for All It was becoming clear , however, realize that the care provided for "all" would have escaped to "many."

If you are not on the wheelchair wheels , or you are not blind , or not traveling with a large family or you do not have to look after the old grandfather , will not be able to perceive many of the social securities included in the project . It was therefore necessary to make more visible the virtuosity of the design process and the results that could not be evident for many .

The result is this book , not as a simple description, but as a critical analysis of Villoresi East , set in a context that wants to develop methods and means of the Design for All

The first objective is therefore to use the "case Rest " to investigate the steps needed to develop projects inspired by Design for All , I hope so authoritative .

4.
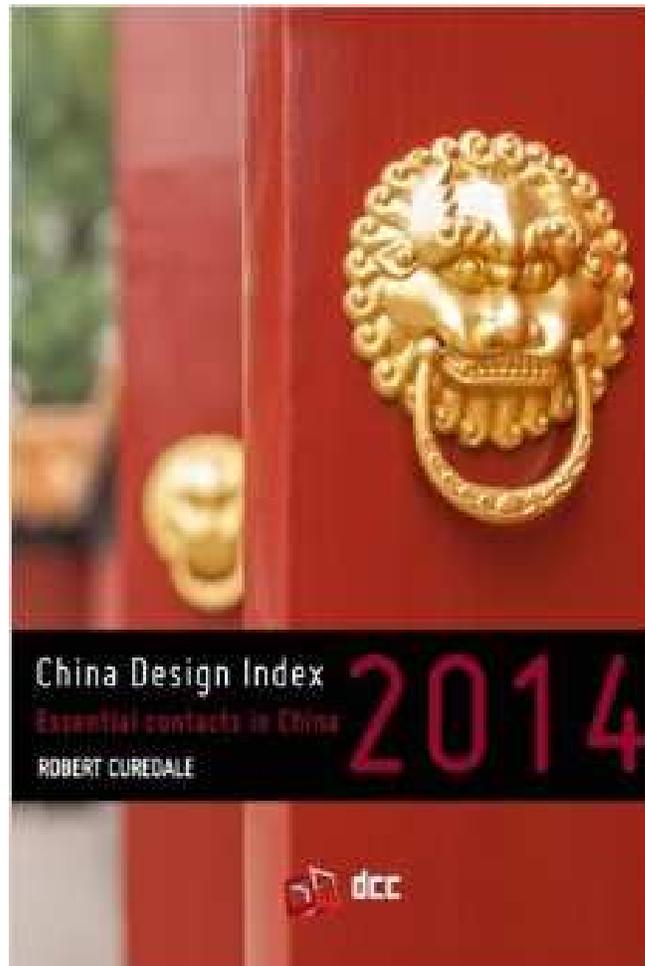
China Design Index 2014: The essential directory of contacts for designers Paperback – February 1, 2014

by Robert A. Curedale (Author)

APPEAL:

Hi,

"CII India Design Report 2014" is a national survey is to understand the Design Industry in India and to report the findings. India Design Council endorses the report. The information presented in the report represents the most up-to-date analytical information about the Indian design industry gathered in one report. The report will

Analyze the current state of design in different design disciplines.
Help with deeper understanding of the design economy
Guide effective policy and program development.
Inform various stakeholders like industries, governments, and public about the strengths and activities of Indian design.
Presents statistics of Indian design, information about design governance, design ecology, applicability of design and some trends.

This is the third such survey being conducted by CII. The earlier India Design Report is available onhttp://issuu.com/ciidesign/docs/cii-_india_design_report_2011/1?e=6041592/4071239

Please take the survey. It will not take more than 20 minutes of your valuable time. Please be assured that the individual survey data will be treated with utmost confidentiality and will not be shared with anyone under any circumstances. The report will highlight combined figures and not individual data.

Business Survey – Businesses, in-house design team. To be filled-in by an authorized person.

https://www.surveymonkey.com/s/BusinessSurvey2014

Design Business – Design consultancies, design companies, freelancers – To be filled-in by an authorized person.

https://www.surveymonkey.com/s/DesignerSurvery2014

Design Education – To be filled-in by design institutes. To be filled-in by an authorized person.

https://www.surveymonkey.com/s/DesignEducation2014

If you have any queries or suggestions please don't hesitate to contact me.

Best wishes!
 Seema Gupta
Director-Design, Innovation & Entrepreneurship

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NEWS:

1.

Earthen home builder has local connections

LMI-1 Prototype, Series 012 Universal Home™ design- Abilene, Texas. First HUD funded Lime stabilized Compressed Earth Block Home in US History. Constructed in 2010. COURTESY PHOTO

Universal Design Consortium, LLC has constructed one of the most advanced, sustainable homes in the country, located outside of the town of Jourdanton, Texas. The home is one of UDC's Universal Home™ series 012 earthen prototypes. The Universal Home™ design standard was nationaly recognized for its advancements in energy performance, healthiness, safety, and sustainability.

Who is UDC

Universal Design Consortium, LLC, (UDC) is a registered architectural and research firm, practicing in the state of Texas (Registration number BR1702). Our staff of professional architects, engineers and building scientists are proficient in the art of sustainable and net zero energy design for both small or large, commercial or residential projects and community development. UDC is a nationally recognized leader in sustainable design and thier work in community revilitzation for low to moderate income applications.

Jarvis House in Jourdanton. This is a Series 012 Prototype home with 2,717 square feet. Average themostat setting per year is 68 degrees with an average monthly electric bill of $146.44. COURTESY PHOTO Our Mission

UDC is collectively dedicated to the architectural, scientific, and engineering pursuit of energy independence through sustainable positive energy architecture. It is our work to discover, develop and implement true tested materials and system configurations that promote energy independence for commercial and residential buildings. Through our "out of the box" exploration and utilization of new and old building materials and methods, our sustainable architectural designs are realized.

History

Universal Design Consortium, LLC, was founded by its principal Steven Mueller on November 22, 2000 in Lubbock. Since its conception, it has grown into the premier sustainable architectural firm in Texas with three design studios located in Lubbock, Dallas and our newest studio and research and a commercial architecturallaboratory presently being constructed in Jourdanton, Texas. Our principal, Steven Mueller, a 1992 graduate of Jourdanton High School, is nationally recognized for his work in sustainable high performance architectural design and his work has been showcased in professional magazines and on television. Most recently, his work in earthen homes was showcased by Bob Phillips on the Texas Country Reporter, a nationally syndicated television program.

Mr. Mueller completed his architectural studies at Texas Tech University in 2007. With his military experience and extensive world travel, combined with his architectural training, perfected the universal design strategies used today by the firm. UDC is a commercial architectural firm, but has a specific interest in small, Low to Moderate Income (LMI) homes with high energy

performance. With more than 80 commercial and residential projects completed across the state of Texas, UDC is most recognized for its designs of LMI houses specifically designed to meet the low income family, senior and handicap housing needs of cities and towns. In 2007, UDC made history with its first production LMI home for the Lubbock Community Development Department, achieving a 60% reduction in electrical expenditures for the home owner, without a substantial increase in construction cost.

The home was a Series 007 Universal Home™ prototype, the first of its kind in the United States. UDC evolved from the lessons learned in 2007 and once again in 2008, gained international acclaim with the introduction of the Series 009 Universal Home™, HUD 1 and HUD 2, designed for the Community Development department in San Angelo. HUD 1 was the first LEED Platinum Zero Energy Home in US history and HUD 2 was the first HUD funded earthen home in US history. HUD 2 was built utilizing 7,000 year old earth construction techniques. The homes construction cost, once again was comparative to a "traditional" home's construction cost.

Since 2009, UDC has designed and/or constructed LMI homes for several West and North Texas Community Development Departments. UDC architects and building scientist have recently completed a performance analysis of the most advanced Home yet; The Jarvis House, a custom Series 012 Universal Home™ located in Jourdanton.

Please contact Steve Mueller, principal of Universal Design Consortium LLC, for additional information at 806-928-1634 or by email at steve.mueller@udcinc.org. Client and sub-contractor contact information can be provided upon request.

(Source: Pleasanton Express)

2. Indian government clears proposals for people with disabilities

The government gave its nod to a proposal to provide accessible mobile phones and laptops to students with vision disabilities and enhance income eligibility ceiling for people with disabilities to help them get more concession and subsidy in purchase and fittings of aids and appliances.

The Cabinet Committee on Economic Affairs approved the proposal of the Department of Disability Affairs to provide accessible mobile phone to students with vision disabilities of 18 years and above only once in five years and to provide laptop, Braille Note Taker and Brailler to school-going students with disabilities (10th and above) once in 10 years.

It also decided to bring certain modifications and revision of cost norms in the Scheme of Assistance to Disabled Persons for Purchase/Fitting of Aids/Appliances (ADIP Scheme).

The changes will be effective from April 1, 2014. As per the modifications, the income eligibility ceiling for 100 per cent concession in purchase of such fittings has been increased from the existing Rs 6500 per month to Rs 15,000 per month and for a 50 per cent concession from Rs 15001 to Rs. 20,000 per month, a government release said.

The cost ceiling for aids/appliances has been revised from Rs 6,000 to Rs 10,000 for single disability and from Rs 8,000 to Rs 12,000 for students with disabilities. The ceiling of cost of medical/surgical correction which presently ranges from Rs. 500 to Rs 3000 has also been revised.   It will be now Rs 1000 for people with hearing disabilities, the double of what it was earlier at Rs 500 and for students with vision disabilities it has been doubled to Rs 2000.

Source: Outlook India

2.

International Design for All Foundation Award Ceremony 2014

On 12 February 2014, during the Urbaccess accessibility and universal design fair in Paris, the Design for All Foundation award ceremony took place. The event, introduced by Jean-Marc Maillet-Contoz , Urbaccess Co-Director and *Handirect* magazine Editor, was attended by a large number of international representatives from government,

education centres, businesses and not-for-profit organisations.

During the ceremony, Design for All Foundation President Francesc Aragall explained that a more "design for all" approach had been adopted for the awards, recognising all examples of good practice submitted. For this, the fifth edition of the awards, the Foundation awarded a total of **38 projects from 10 different countries the "Good Practice" label**, as they had met the **assessment criteria**. These Good Practices were then assessed in terms of their relevance, methodology, outputs, impact and innovation by an international jury to determine the five which should receive a trophy.

The representatives from the Good Practices in each category were called up to receive their certificates, before the winners were announced and toasted in the champagne reception following the event:

Category 1: Project proposals, initiatives, methodologies and studies carried out by Living Labs or other organisations

Winner: AddCinema

Sennheiser Streaming Technologies GmbH, Germany

Winner: Making electronics accessible to people with learning disabilities

University of Reading and **The Rix Centre**, UK

Category 2: Products and services already in use

Winner: Design and manufacture of integrating playgrounds

Galopín, Spain

Winner: SIXPOINTS

EO Guidage and Tactile Studio, France

Winner: The League of Historical and Accessible Cities

**European Foundation Centre, Belgium, and partners across Europe**

Once again the Foundation would like to offer sincere congratulations to all those who were recognised for their Good Practice. We would also like to thank all those who attended the event for joining us on an occasion of such importance for the Foundation.

Please note that entries are now accepted throughout the year, and candidates will be informed whether their project has been selected as a Good Practice within 30 days of submitting it. At the end of the year, Good Practices will be automatically entered into the Design for All Foundation Awards. For further information on how to enter, visit the entry procedure webpage.

(Source: Design For All Foundation)

PROGRAM & EVENTS:

1.
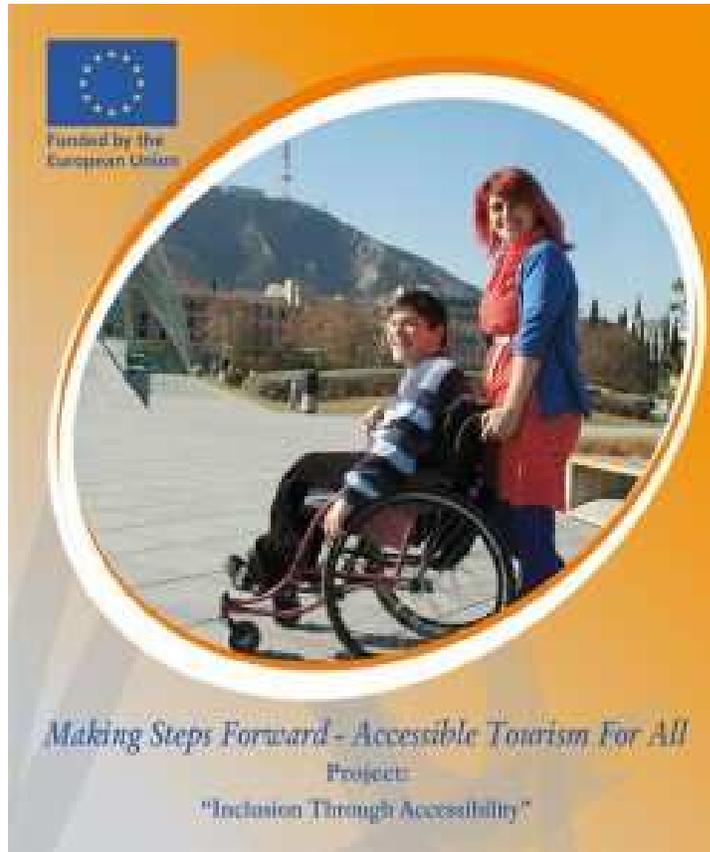
2.

CALL FOR ENTRIES:
POSTER DESIGN COMPETITION

You are invited to design poster for ICSID interdesign 2014 workshop
Contest Theme:

Humanizing the Metropolis

Background

Under the theme Humanizing the Metropolis, the Interdesign workshop aims to design solutions to address critical service issues in the metropolis. The goal is to enable the city to become self-reliant on its resources, as well as increase its citizen's sense of pride.

"In the context of emerging economies, Mumbai presents numerous opportunities for a dialogue about infrastructure, housing, sanitation, mobility, education and health care to name but a few. It demonstrated the challenges of this densely populated city and a desire to work towards the betterment of its communities through an inclusive process. In selecting their proposal, we hope to help the city bring forward a substantial level of affordable solutions to address some of these critical issues."

The competition calls for poster that expresses the interdependence of citiy's services, its resources and the people.

Awards

First winner Rs. 100,000. (One lakh) with citation)

Second winner Rs.50,000. (Fifty Thousand with citation)

Grand Jury

The member of the Grand Jury panel comprise of leading designer, thinkers and communication experts. People who love Mumbai.

Participation Eligibility

Entry to the contest is open to all Professional designers, design students living in India

Participation is open to teams and individual submissions.

Submitted designs must be original and not currently in publications.

Submit the design with a brief write-up of around 150 words.

Specifications

Dimension of the final poster: 420mm X 600mm only in portrait format

Resolution: 300dpi

File type: JPEG or PDF

Colour mode; CMYK

Your Contact Information

Name, Postal Address, E-mail, Telephone no. Cell No

Last date of Submission of your entries

Friday June 21, 2013, 4pm.

If you have any queries, pl. do not hesitate to contact us:

SudhakarNadkarni

nadkarni36@yahoo.com

or Anand James Dev

anand.dev@welingkar.org

Send Entries to:

ICSID Interdesign 2014
Business design
weschool,Matunga,
Mumbai-400 019
3.

12th Global Conference on Ageing
10-13 June, 2014
Hyderabad, India
"Health, Security, and Community"

http://ifa2014.in/

Calling For Abstracts, Papers, Workshops, and Symposiums!

4.

5.

6

Transportation connects us all.

Whether it's simply getting from home to work or using products shipped over distances near and far, in every region of the world transportation impacts our daily lives.

At first glance, transportation may simply appear to be about the movement of people and goods. But looking deeper, it's also closely linked to equality, access to healthy food and good schools, and wildlife impacts, for example.

As the mobility demands of people and freight have grown, so too has the need for products, systems, and services that will make the transportation sector more life-friendly, for both people and the planet.

Registration is now open

Learn biomimicry and how to apply it while competing for cash prizes with students from around the world.

Register your team for immediate access to the biomimicry design resources and start developing your design solution today!

7.

8.

9.

10.

11.

12.

Call
BIO 50: Now
3/3/-5/31/2014

The Biennial of Design (BIO 50) launches a call for applications for its NOW program, a parallel program that will animate the city of Ljubljana during the three months of the Biennial, offering a lively ensemble of events, exhibits and lectures that will work as a platform to launch or present design initiatives, products, business ideas, research and projects. BIO 50 invites individuals, designers, curators, educational and cultural institutions, retail and business ventures to take part in the NOW program, by submitting an application through 31 May 2014.
more »

13.

HCI International 2014

22 - 27 June 2014, Creta Maris, Heraklion, Crete, Greece

14.

3rd ICDC
International Conference on Design Creativity

The Third International Conference on Design Creativity

3rd ICDC

12-14 January 2015

Centre for Product Design and Manufacturing | Indian Institute of Science, Bangalore, India

15.

16.

17.

18.

The Biennale Internationale Design   SaintÉtienne 2015

19.

Welcome to VINCI'14

The 7th International Symposium on Visual Information Communication and Interaction (VINCI 2014) provides an international forum for researchers and industrial practitioners to discuss the state of the art in visual communication theories, designs, and applications. VINCI has been previously held in Shanghai (VINCI'2008), Sydney (VINCI'2009), Beijing (VINCI'2010), Hong Kong (VINCI'2011), Hangzhou (VINCI'2012) and Tianjin (VINCI'2013). VINCI '2014 will be held on August 5-8, 2014 in Sydney, Australia.

Job Openings:

1.

JOB DESCRIPTION

Company	Department	Location
Rediff.com	Product Development	Mumbai

Job Title: User Experience designer

Main Purpose of Job

To drive Interaction Design + User Interface design process for various products and services of Rediff.com. This position requires working closely with Engineers and Business Managers throughout all stages of the product development cycle.

Main Responsibilities

- Conceptualize the UI (web and devices) for new and existing products and features
- Articulate various personas, use case scenarios and create story boards, wire frames.
- Develop and maintain navigation schemes, interaction design, standard patterns across various form factors and define style guide for the site.
- Translate wire frame prototypes into consistent GUI across desktop, handheld and touchscreen devices.
- Take ownership of UI engineering to deliver the final UI.
- Communicate effectively with real users, monitor user feedback and translate it into design decisions
- Interface with all multidisciplinary stakeholders (product management, product development, business alliances) to ensure fast-paced delivery of product features
- Data visualisation, interactive information graphics and gamification - Creatively depict and communicate data in visual form to significantly improve user's understanding and engagement.

Qualifications / Experience

- Graduate (preferably in Graphic Design, Applied Arts) and /or Post Graduate from Design schools like IDC - IIT / NID
- 1 – 3 years of similar experience
- Knowledge of Typography
- Expertise in designing product concepts at fast pace, with agility.
- Should have a passion for new media, excellent understanding of Internet technologies and enthusiasm for working on multiple platforms (including apps on hand held devices)
- Expertise across all form factors - web, devices, mobile web, mobile apps etc.
- Understanding of HTML, HTML5, JavaScript and XML.

2.

Looking for experienced (senior or middle-weight) graphic designers in Bombay

We need someone who can conceptualize, is strong in idea generation, has good esthetic sense, lead and nature a team of young designers and the ability to execute the concepts.

Packaging (fmcg) and branding background is essential. Understanding of printing/ inks/ substrates/ materials etc is important.

Prefer candidates looking for a full-time job in Bombay and are from here. Please send your CV/ folio to dcosta.francis@gmail.com, with details of notice period and current/ last salary.

Please note that I am a head hunter working with some leading branding agencies in Bombay. I do not have freelance projects or part time openings.

3.

Full time Faculty Positions at School of Fashion & Design, GD Goenka University

GD Goenka School of Fashion & Design is now half way through its first year of operation, and is now looking for recruiting full-time faculty for the next year for its communication,interior, fashion and product design programmes at Bachelor, Masters and Doctoral level. The teaching and laboratory facilities at the school as also the details of courses can be accessed at the following links:

http://www.gdgoenkauniversity.com/schoolofdesign/

https://www.facebook.com/pages/GD-Goenka-School-of-Fashion-Design/ 436852256360642?fref=ts

https://www.facebook.com/gd. goenka.9?fref=ts

Applications are being received now and the interviews will be scheduled between Mar-May. Selected faculty will be expected to join between June-July.

Applications/Letters of interest may be sent to deanoffice.design@gdgoenka. ac.in

4.

New openings for Senior / Lead UX designers for Pune Location. Interested candidates please forward your resume and portfolio to Mrinal.Mazumdar@techmahindra.com

5.

Internship positions at IMRB Innovation labs, Bangalore

Innovation Labs is the consulting division of IMRB International, a WPP Group (UK) company. We provide strategic innovation expertise to companies serving Indian consumers. Our multi disciplinary team of specialists apply design thinking process to envision and develop innovative products. services and consumer experiences. Our clients include ITC, Godrej, Pepsico, The World Bank, Zee Network, Airtel, Alcatel-Lucent among others.

We are looking for 2 interns starting asap for a period of 4-6 months. They need to be PG students only and preferably with some work experience after their UG. They need to have a strong interest in consumer behaviour, meticulous in research and analysis and very pro active, excellent communication, good graphic design and possibly foodies. Design background is not essential.The positions are based in Bangalore.

If interested, please send portfolio link along with profile to:

Yugandhara SinghSenior Innovation Consultant, Innovation LabsIMRB International,

Bangaloreyugandhara.singh(at)imrbint.comyugandhara.singh@imrbint.com

6.

Looking for a Graphic Designer to join the design team at a leading architecture/design studio based in Delhi. Our work pans across various fields, Branding, Environmental Graphics, Wayfinding and Product Graphics to name a few. Expected work experience is 0-5 yrs, with good conceptualization skills.

Those interested kindly send in your resume/portfolio/web links at my email id below. References are also welcome.

Ayushiayushjain(at)gmail(dot)com

7.

Position is for our Pune office.

Design Research Manager (DMON-1401)- One Position

Candidate is a graduate/post-graduate in any of the humanities streams like sociology, cultural anthropology, psychology, literature OR a person with MBA in mass-communication/marketing from a reputed institution OR a designer with experience in qualitative research, who has moved up the ladder.

Candidate must have a prior experience of conducting qualitative research with direct field experience. Expected role requires ability to manage different aspects of projects like team management, time management, communication management, delivery quality management, invoicing and business analysis etc. This position requires extensive travel.

Must have: A minimum 2 years of experience in a team-leader's position in a market research company, design company, design research company or trend consulting company; written and verbal communication skills in English.

Write to manoj at oniodesign dot com with half a page write-up about yourself and a standard resume.

8.

Endeavour Software, Bangalore is a leading organization in Mobility (visit http://www.techendeavour.com) and UX Lab, Endeavour is looking for Mobile UX consultant / freelance designer for short term engagement in Bangalore.

Please send your portfolio and resume at uxjobs@techendeavour.com with subject freelance Mobile UX

9.

Designflyover (DFO) is looking for one Engineer+Transportation/ Product Designer as an intern for a self initiated transportation design project in the personal mobility space.

Interested applicants can mail their resumes to joinus@designflyover.com along with a link to their online portfolio.

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With regards
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