DESIGN FOR ALL

DESIGN TO LIVE:
Inclusive Design and Social Innovation

SAN FRANCISCO
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Foreword

Universal Design:
A Driver for Transforming Global Education

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Brian Donnelly earned a MFA degree in Industrial Design from the Rhode Island School of Design and a Doctorate in Education from The University of California, Davis. His work in the educational field includes thirteen years as a full time faculty member in Industrial Design and Manufacturing at UCLA, Illinois State University and San Francisco State University. He taught eight years at the secondary level in Career Technical Education and STEM program coordination. He has worked as the Executive Director of OC Pathways, a $15 million California Career Pathways Trust grant awarded to the Orange County Department of Education. He has been President of LifeSpan Furnishings for the Aging in Place Market and Sr. Industrial Designer in the Silicon Valley/SF Bay Area. Brian holds 8 U.S. patents and has received numerous design and service awards from organizations that include The National Endowment for the Arts and the American Society on Aging. For the past nine years Brian has leveraged his experience in education and industry to support a variety of educational initiatives. These include service as a curriculum design consultant with Autodesk, as well as project management roles with the Bechtel Foundation STEM research project and the NSF-funded Computing in STEM (C-STEM) projects at UC Davis.

Universal Design: A Driver for Transforming Global Education

OC Pathways SPARK Education Professional Development Workshop: "Igniting College and Career Successes through Integrated Academics" (Orange County Education Department, June 29-July 1, 2015, Urban Workshop, Costa Mesa, CA)

The 1983 release of the federal report "A Nation at Risk" sparked an obsession in the United States on rectifying America's decline as the world's educational leader. Today, as many countries eclipse the U.S. on rankings from international standardized tests such as PISA (Programme for International Student Assessment) and TIMMS (Trends in International Mathematics and Science Study, leaders from business, politics and education have been calling for major reforms. The general message is that in a global economy, students from the U.S. find themselves competing with the best and brightest from all over the world. The demands of global competitiveness therefor requires significant reform in our educational system especially targeting increased performance levels in math and science.

Here's the dilemma. Reform implies that the basic elements of a system are sound. The premise is that moving around or "re-forming" those elements can generate positive change. While the world is well into the 21st century, the U.S. has been pouring literally billions of dollars in reform efforts that fundamentally do not diverge from the 20-century industrial or factory model of education that were relatively successful for past generations. In the recently published book, "Most Likely to Succeed" Sir Kenneth Robinson points out that the current system that drives education is a highly functional configuration of rules and regulations, like standardized lists of subject matter to be covered at very distinct age levels and carefully orchestrated chunks of time orchestrated through bell schedules. This system is indeed highly efficient in keeping masses of youngsters in line and moving them through a standard set of actions, much like a product moving down the assembly line. Instead of a fully assembled car emerging at the end of the line, the end product of this factory model education assembly line is a properly educated student. As Robinson argues, while the dominant system is highly functional, it is out archaic.

Tony Wagner, in his book Creating Innovators, makes a simple but profound observation, he writes that, "….in today's world knowledge and information is ubiquitous. Technology provides almost instantaneous access to a rapidly growing segment of the world's population. In light of this, it is imperative that we transform education from a system built around the goal of delivering knowledge and information (the teacher lecturing, students memorizing from text books) to a system where the emphasis is having students apply knowledge to authentic problems."

OC Pathways SPARK Education Professional Development Workshop: "Igniting College and Career Successes through Integrated Academics" (Ricardo Gomes, Design Thinking Workshop Facilitator)

The principles of Universal design and Design thinking methodologies can play a vital role in moving from education reform to educational transformation. In the still dominant 20th century education model the students (factory components) are viewed as equal. All students are challenged to succeed in a learning environment that is essentially developed around the assets of one type of learner. Despite vast differences in learning styles and socio economic backgrounds the current approach attempts to push all students through the same mold. The type of system envisioned by Wagner is one in which multiple styles of learning can be employed as students engage in applying knowledge to solve problems. This line of reasoning is consistent with extensive research on cognition and learning where data clearly demonstrates that learning is a very complex process that can be approached in diverse ways.

While Universal Design for Learning (UDL) has gained recognition as an important tool for promoting broader access to information and knowledge, the real potential for universal design as a catalyst for change centers around the distinction between equality and equity. A fundamental principle of Universal Design acknowledges that individuals come to learning with differences. The solutions are not found in promoting equality; solutions emerge from a recognition that our inequalities demand that we pay attention to equity. A person who may auditory challenges can benefit by closed captioning, a person with dexterity challenges may benefit by access to voice captioning. Access to adaptive technologies and approaches to user interfaces that allow for multiple points of access are critical. This fundamental valuing of equity that is central Universal design can play a key role in the transformation of education.

In his groundbreaking work on Multiple Intelligences, Harvard professor Howard Gardner emphasizes the " the extent to which students possess different kinds of minds and therefore learn, remember, perform and understand in different ways," Gardner's theory of multiple intelligences stresses that "we are all able to know the world through language, logical-mathematical analysis, spatial representation, musical thinking, the use of the body to solve problems or to make things, an understanding of other individuals, and an understanding of ourselves. Where individuals differ is in the strength of these intelligences - the so-called profile of intelligences -and in the ways in which such intelligences are invoked and combined to carry out different tasks, solve diverse problems, and progress in various domains."

Gardner says that these differences "challenge an educational system that assumes that everyone can learn the same materials in the same way and that a uniform, universal measure suffices to test student learning. Indeed, as currently constituted, our educational system is heavily biased toward linguistic modes of instruction and assessment and, to a somewhat lesser degree, toward logical-quantitative modes as well." Gardner argues, "A contrasting set of assumptions is more likely to be educationally effective. Students learn in ways that are identifiably distinctive. The broad spectrum of students - and perhaps the society as a whole - would be better served if disciplines could be presented in a numbers of ways and learning could be assessed through a variety of means."

It is intriguing to note that both Universal Design and the Design Thinking methodology for problem solving share a similar emphasis on the notion of empathy as an essential driver of creativity and problem solving. Empathy is viewed as a deliberate and expansive effort to fully understand the end-user. In the case of education the primary "end-users" are the students. Consequently real systemic transformation must begin with recognizing the myriad ways in which students learn and approach problem solving.

The articles and papers included in this "DESIGN TO LIVE: Inclusive Design and Social Innovation," publication of the Design for All Institute of India, Guest Edited by Ricardo Gomes, Professor in the School of Design at San Francisco State University, offer insights onto how the principles of Inclusive Universal Design practice can promote equity with respect to access and use of the physical environment. The methodologies underlying creativity in these writings and design research can and should be employed in guiding efforts to transform global education from the 20th century factory model to a flexible system that engages students in diverse ways of learning that will prepare them for life and success in a world where change is the only constant.

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Design to Live: Creating Your Own Lifespace
Access to Design Professions Symposium and Workshop

Ricardo Gomes, IDSA
Professor, School of Design, San Francisco State University

MFA in Industrial Design and MA in Architecture from the University of California, Los Angeles and a BFA in Industrial Design from Massachusetts College of Art. Prof. Gomes has been a faculty member in the School of Design (formerly Design and Industry Department) at San Francisco State University for over 25 years, where he coordinates the Design Center for Global Needs and the Shapira Design Archive Project. Prof. Gomes' area of expertise and research relates to Inclusive/Universal Design; Design for Social Responsibility; Sustainability and Design Thinking Methodologies. He has conducted design keynote speeches, presentations, symposiums and workshops at universities and international conferences throughout Africa, Asia, Europe, Latin America and the U.S.

In order to promote the principles of Inclusive Design and Access to Design Professions (ADP), the Department of Design and Industry, in conjunction with the Nathan Shapira Design Archive Project and Design Center for Global Needs in the College of Liberal & Creative Arts at San Francisco State University presented the **"Access to Design Professions** (ADP) **Orientation; Symposium and Workshop,"** April 11th to 13th, 2013

The ADP program was initiated in the year 2000 by the Boston-based Institute for Human Centered Design – at that time The Center for Adaptive Environments – in order to support the recruitment of people with disabilities into careers in design.

Key program goals were to:

1. Teach people with disabilities about careers in design.
2. Recruit students with disabilities into post-secondary design education programs.
3. Develop professional interaction and understanding among design professors, disability services staff, career counselors, vocational rehab counselors and post-secondary guidance counselors.

As part of this program The College of Liberal and Creative Arts, San Francisco held a three-day Inclusive Design Orientation and Workshop entitled, **"Design for Living -Creating Your LifeSpace"** at SFSU. The primary goal of this design event was to promote universal and inclusive design principles to potential Community College Transfer, or Continuing SFSU students, in particular, students with disabilities, so that they may pursue applying to the design majors at SFSU.

Nicole Bohn, DPRC Director and **Phil Evans**, Director, Campus Settings (L); **Ralf Hotchkiss**, Co-Founder of Whirlwind Wheelchair International and Workshop student participant (R)

The Symposium & Workshop sought to orient and prepare students with disabilities to educational and professional career opportunities in the design disciplines. There were three primary goals and collaborative interfaces.

(1)   **To introduce inclusive human-centered design applications** in the design curriculum at SFSU that will orientate students, both the students with disabilities and conventional university design students to the holistic benefits of design education and practice that go beyond the exclusive and limited convention of mainstream design applications.

(2)   **Exposing students to inclusive participatory design empathy methodology.**

(3)   **Design Empowerment** will focus on identifying and creating design concepts for the product environment and interior space that facilitates one's ability to access and manipulate the active learning and recreational environment at home, or at school.

As an Impacted Program, the DAI Department, along with the Interior Design and Apparel Design & Merchandising Programs, sought to utilize this Student Outreach endeavor to facilitate student preparation for applying to the respective programs. The program was structured to assist in having students begin developing their Supplemental Applications for submission before the Fall Semester 2013, November 30 , 2013 University and Department Application Deadline.

During the Fall Semester 2012, the organizers had been working and meeting with various College and University Administrative Services, such as the Longmore Institute on Disabilities; Disability Programs Resource Center (DPRC); the Student Outreach Services and Undergraduate Advising Center to establish connections with students registered with the university DPRC. The Program was assigned two DAI student research assistants, one undergrad and one graduate student, who are both registered through the DPRC and were Principle Facilitators for the Program in the Spring Semester 2013.

SFSU/ADP Planning Meetings were conducted throughout the Fall Semester 2012 and the Spring Semester 2013 in preparation for ADP Orientation; Symposium & Workshop with university administrators, faculty and staff from the following areas:

(1) Brett Smith, Director of Student Advising and Frieda Lee, Director of Community Outreach
(2) Nicole Bohn, Director and Geoff Brown Assistant Director of Disability Programs and Resource Center,
(3) Cathy Kudlick, Director of the Paul Longmore Institute on Disability
(4) Phil Evans, Director of Campus Settings
(5) Dr. Gus Vouchilas, Professor of Interior design Program
(6) Dr. Sandra Rosen, Director of Orientation & Mobility, Special Education Program
(7) Marc Krizack, Executive Director, Whirlwind Wheelchair International
(8) Ralf, Hotchkiss, Co-founder, Whirlwind Wheelchair International

During the Spring Semester 2013, students from the introductory Design Process course, DAI 300 and students from the advanced Product Design 2 course, DAI 410, conducted inclusive design projects that would be later utilized as project exemplars to be conducted in the ADP Workshops Design Charrette activities. Prior to the April Symposium and Workshop a series of Access to Design Profession Orientation Sessions were conducted at SF State and at designated affiliated Community Colleges between January 11 thru March 1st, 2013. The purpose of these Student Outreach Orientation Information Sessions were held to promote, identify and recruit prospective students from the respective schools to register and participate in the ADP Symposium and Workshop at SF State. Faculty, counselors and students were presented with an Access to Design Preliminary "Inclusive/Universal Design" Orientation, as a preview to the ADP Symposium & Workshop. These "Pre-Orientation" information sessions were open to all students and all potential majors, but with a particular focus on students with disabilities.

(1) **Email and telephone communiques were conducted** throughout the Fall Semester 2013 and Spring Semester 2013 with network of "feeder" Community Colleges that are affiliated with transfer students to SFSU (City College of San Francisco; Chabot Community College; Diablo Valley College; College of Marin; San Mateo Community College; Santa Rosa Community College; Skyline Community College)

(2)   City College of San Francisco, Disabled Students Programs and Services (1/11/13)
(presentation to DSPS Counselors and Department Chair, Muriel Parenteau - 2
counselors and 3 students attended, follow-up ADP Symposium & Workshop

(3)   Santa Rosa Community College (2/27/13) (presentation to DSPS students - 3 students
attended, follow-up ADP Symposium & Workshop)

(4)   San Francisco Public Library Disability Resource Center, Marti Goddard, Access
Services Manager (3/1/13) (presentation to Access Services Manager & participants -
students attended, follow-up ADP Symposium & Workshop)

DAI 300 Design Process Students, leading Universal Design Pre-Workshop session (L);
Mona Chiu, Workshop Assistant Coordinator, who is also a registered disabled student, consulting with a
disabled student participant(R)

The Pre-WORKSHOP Session, which was held on Thursday, April 12th, 2013, prior to
the Symposium Reception and Presentations, was structured as a formal Welcome and
Introduction for the Workshop student participants and facilitators. It was also utilized
as an opportunity for participating design programs to formally present their respective
design majors, curriculum and career paths. Participants were also introduced to the
university support services on campus that are facilitated by the Disability Programs
Resource Center. In addition, participants were presented with an overview of inclusive
and universal design principles and applications by academic and design professionals.
Students from the Graduate and Undergraduate Design Programs presented project
exemplars that were showcased and utilized as a "primer" for the following Workshops
the following day, Fri, April 12th, 2013.

Symposium Panelist and Speakers: Cathy Kudlick, Executive Director, Paul Longmore Institute on Disability; Dmitri Belser, Executive Director, Center for Accessible Technology/President of the Ed Roberts Campus (L); Dr. Patricia Moore, MooreDesign (C); Elaine Ostroff, Institute for Human Centered Design; Chris Downey, Architect or for the Blind (R)

The SYMPOSIUM, which was held on Thursday evening, April, 11th, 2013, was a FREE public event that included keynote addresses and panel discussions from leading design professionals, disability advocates, agencies and organizations in the San Francisco Bay Area and beyond, such as Dr. Patricia Moore, MooreDesign Consultants and Chris Downey, Architecture for the Blind. The Symposium featured a Keynote address from Ms. Elaine Ostroff, Founder and former Executive Director of the Institute for Human Centered Design in Boston (formerly Adaptive Environments Center) and Director of the Access to Design Professions Program, which was sponsored by the National Endowment for the Arts, Office of Accessibility. The Symposium also featured a Panel Discussion by prominent speakers and practitioners in the field of disability advocacy and inclusive design principles.

The WORKSHOP, which was held on Friday, April 12th 2013, was structured as an Inclusive Design Charrette, involving a diverse team of design professionals; facilitators; faculty and students. The RSVP Registration was limited to student 30 participants, although auditors and viewers were allowed to observe. The Workshop included hands on Inclusive Design Thinking presentations, activities and exercises for the student participants, based on the principles of universal design.

Workshop Participants include students, faculty and professionals with and without disabilities, (L) Elnaz Davoudi. There were many outside participants from the SF Bay Area Community's

Workshop Presentations by students, faculty and professionals with and without disabilities, (L) Prof. Jim McClusky, San Jose State University; Ayana Baltrip, Adjunct Professor & Graphic Design with Mona Chiu(R).

Students with disabilities had the opportunity to work directly with local designers and design students, including current and former design students with disabilities. The workshop theme centered around an Inclusive Design Overview and Assessment of two campus-facility focused projects: the newly renovated University Library, "Inclusive Design Wayfinding Signage System for the Campus Library," which was conducted in the Morning Workshop, and the other project was for the "Inclusive Design of Outdoor Table and Bench Seating" for the Campus Quad and Student Center plaza area.

The FINALE for the Three-Day Inclusive Design event, which was held on Saturday, April 13th, 2013, summarized the Workshops "Findings & Reflections" with a presentation as part of the university-wide "Sneak Preview" Campus Open House.

The OVERVIEW and CONCLUSIONS:

As the result of the Symposium and workshop a greater understanding has been fomented, if not re-established on campus and in our community outreach with disability rights advocates and design professionals. The focus on the workshop was not on high school students, but on current students and potential transfer students. The Program was able to attract students not only from campus and the local feeder community colleges, but also students from as far north as Santa Rosa and as far south as San Bernardino.   Three students that attended the workshop entered the program in the fall semester 2013. Two out of those three were students with disabilities.

Workshop Design Thinking Activity Form (L); Elaine Ostroff, Founder of Institute for Human Centered Design with Ralf Hotchkiss, Whirlwind Wheel Chair International

Elaine Ostroff closed the session for us. It was a wonderful wrap up. We integrated the closing session into a campus-wide open house which had 6,000 people coming on to campus who are going to be starting the university program the next year, had nothing to do with Universal Design, had nothing to do with the workshop, but we presented the results to the entire campus.

There were many different levels where this was hands on, but at the same time disseminated on a broad level, so not only people that were on the ground benefited but also people who were coming on the campus for the first time. We had some wonderful students. I had a student that worked with me with disabilities who was really my key person. She was like my right hand person. We had a lot of engagement from folks involved with the workshop. Everybody gave their own testimonial at the end of the experience.

The final comment was from Phil Evans, the director of campus planning, who said this was an eye opening and thought provoking experience. "I will continue to see how we can build on this beginning of much better design process for our society and for our campus."

One of the more significant outcomes as a result of the event is that we were awarded a $5000 annual scholarship (for 5 years - $25,000) from Hearth Homes (founded by Sue Siegel) for a deserving Senior or Graduate Student applying significant study in the area of Inclusive Design. The purpose of the Hearth Homes Inclusive Design Scholarship is to assist, encourage and attract promising SF State students to the field of inclusive (universal) design." The Department is also seeking to sponsor an annual ADP Symposium (and/or Workshop) on Access to Design Professions. Currently the program is in the discussion with the College Dean and the Director of the Paul Longmore Institute on Disability and the university Disability Programs Resource Center about the possibility of conducting a symposium/workshop on "Deaf Architecture and Design for the Built Environment.

Students Design Shopping Cart for Elderly Community

Emily Chavous
Assistant Editor at *Palm Springs Life* magazine

Emily Chavous is the Assistant Editor at *Palm Springs Life* magazine. She studied Print/Online Journalism, Women/Gender Studies, and Social Media Marketing at San Francisco State University Emily was a reporter with the Golden Gate Xpress when she wrote a series of articles on "City Cart."

(Ricardo Gomes, SFSU)

June **Fisher loves tomatoes**. The 82-year-old occupational health physician and Bay Area product design lecturer requires two walking sticks to compensate for knee problems and general muscular weakness. She can't sling a shopping bag over her shoulder, and that makes things a little difficult.

"A friend of mine said the Civic Center market (had) wonderful heirloom tomatoes at $2 a pound," Fisher said. "I quickly got dressed and I was ready to go down, and then I realized that I would be unable to go shop by myself. And that was a (moment of) despair because when you say 'ripe tomatoes' in front of me, I really salivate."

But two SF State senior industrial design students created a solution. Brandon Lopez and Eric Renard, both 23, prototyped a portable shopping cart for elderly people with mobility issues. Their "City Cart" has been selected as a finalist in the Stanford Design Challenge, which was held at Stanford University on April 5th, 2016.

The students conceived their mobile shopping cart during Fall Semester 2015 as part of the Product Design II course taught by Prof. Ricardo Gomes, who invited Fisher to work closely with the class. Gomes tasked student teams with creating a cart that would assist an aging demographic with basic errands, like shopping at the farmer's market.

"The biggest thing we were focusing on from day one is designing a product that fits the consumer," Renard said. "Elderly people want their autonomy. They want to be able to do the shopping, and they don't want to have to be picked up by their kids. They'd like to be able to do it all on their own, and with our shopping cart they can."

The Stanford Design Challenge is an international competition for university students hosted by the Stanford Center on Longevity, which backs entrepreneurial product design supporting a positive aging experience, according to Ken Smith, challenge director and head of the Stanford Center on Longevity's mobility division. This is the competition's third year.

"We wanted to get more students engaged in working on issues around longevity," Smith said. "I think everybody is recognizing that the population is growing older, the demographics are shifting, and this is going to be a really important area as we go forward to the next century."

Supermarket carts are solid enough to lean on, but collapsible "granny carts" often used at urban farmer's markets do not provide appropriate support for people with mobility issues, Fisher explained.

"The idea of a cart is not exotic, but (it's) important to my life," Fisher said.

After conducting multiple interviews in the aging community, Lopez and Renard realized the need for a supportive personal cart is widespread. Renard said existing carts are generally constructed with weak materials with little attention to aesthetic.

"People put a little bit of thought and design into (portable carts), but they just paint (them) that nasty old-person beige," Renard said. "Just because people are aging, they don't want ugly products. They want something that fits their needs but is also stylish – (a product) they aren't embarrassed to use."

SF State's team is one of 12 who presented designs to a panel of industry judges and an audience of 200, Smith said. Each team of finalists, selected mid-January 2016 after an open online submission period, received $1,000 for prototyping, industry mentorship and paid travel expenses to attend the competition in April 2016 at Stanford University.

"Essentially, (there are) three criteria that we look for," Smith said. "Number one is impact. Does the design actually address a problem? Is it going to do any good in the world? Second is originality. And third is feasibility – probability of implementation and cost."

Three teams won cash prizes to bring their designs to market – $10,000 for first place, $5,000 for second and $2,000 for third. Competitors hailed from UC Berkeley, National Taiwan University, National University of Singapore, National Chiao-Tung University (Taiwan), National Taiwan University of Science and Technology, National Yunlin University of Science and Technology (Taiwan) and Virginia Tech.

Brandon Lopez (left) and Eric Renard pose next to their collapsible shopping cart design for the upcoming Stanford Design Challenge. (Eric Chan / Xpress)

"You build a prototype, figure out what's wrong with it, build another one, figure out what's wrong with it," Lopez said. "That's fun for us, especially something like this that's larger scale. It's not just a little phone or something, it's a big walker-type device. So it's pretty cool making something that is life-size."

Smith said he is impressed by the SF State design program, which has put forth a finalist in the Stanford Design Challenge each year since its conception. "It's a really polished design," Smith said of Lopez and Renard's collapsible cart. "They used 3D prototyping really effectively to their advantage."

(Brandon Lopez and Eric Renard)

The students said departmental support has kept them motivated through back-to-back 12-hour workdays in the design lab. That, and their mutual love of chorizo burritos and Drake. Both recently accepted job offers with a "design slash tech incubator" in Santa Cruz, California.

"We feel like we have a very good shot at winning," Renard said. "Hopefully we can make SF State proud."

(**Guest Editor Note:** Article was originally written March 29th, 2016, SFSU Golden Gate Xpress)

San Francisco State University Students Win Stanford Design Challenge

Emily Chavous
Assistant Editor at *Palm Springs Life* magazine

Emily Chavous is the Assistant Editor at *Palm Springs Life* magazine. She studied Print/Online Journalism, Women/Gender Studies, and Social Media Marketing at San Francisco State University Emily was a reporter with the Golden Gate Xpress when she wrote a series of articles on "City Cart."

Eric Renard (l) **and Brandon Lopez** (r) **pose with Dr. June Fisher** (left) **and with their first place trophy** (right) **from the Stanford Design Challenge.** (Ricardo Gomes, SFSU and Eric Chan/Xpress)

The moment Brandon Lopez and Eric Renard's names were announced as grand-prize winners of the Stanford Design Challenge, April 5th, 2016, throngs of supporters and potential investors clamored to bestow their business cards. "Eric was overwhelmed," Lopez laughed. "And I was on a high as soon as they called our names, so I kind of don't remember it. I had a mini blackout."

Last Fall Semester 2015, the senior industrial design students began work on a collapsible shopping cart for elderly people with mobility issues, a project assigned in SF State's Product Design 2I course taught by Prof. Ricardo Gomes.

A judging panel selected their "CityCart" design from a pool of international university students to be one of 12 finalists in the Stanford Design Challenge, as previously reported by the (SFSU) Golden Gate Xpress. Entrants placed in two categories: mobility and mind. Lopez and Renard won first place in mobility and took home a check for $10,000.

(B. Lopez & E. Renard)

(Ricardo Gomes, SFSU)

They credit their inspiration to Dr. June Fisher, an 82-year-old occupational health physician and Bay Area product design lecturer who worked closely with the duo throughout production.

"Oh, it was so exciting!" Fisher exclaimed. "I was out of character, on my edge as they were announcing the winners. When they announced Brandon and Eric, I just jumped up and said, 'Yay!' They really deserved it."

Jumping is difficult for Fisher, who has limited mobility and experiences frequent muscular fatigue. She said she looks forward to having a CityCart of her own, something supportive enough to navigate a farmer's market and pick up a few heirloom veggies without relying on someone else.

"The design came from a particular person's need – my need," Fisher said. "They've been very conscientious, committed and creative, and I predict they'll have great futures as product designers."

Prof. Gomes' class has put forth finalists each year since the competition's 2013 inception. This is the first year an SF State team has placed.

"They said at the very beginning, 'We are going to win this,'" Gomes said. "Their work ethic, the way they approached the problem – they had a tremendous amount of vigor and energy, and my only disappointment was that they didn't submit their project to the International Housewares Manufacturers Association (IHMA) Student Design Competition."

Polly Dawkins, executive director of the Davis Phinney Foundation For Parkinson's, was one of eight judges on the mobility panel. "I was really intrigued that they had gotten to the prototype level with their design," Dawkins said. "That, for me, gave them a distinct advantage. It didn't look like it was designed to be a walker – it looks cool and rugged and useful, and I could imagine anyone using it."

The top three designs were clear to the judges, according to Dawkins. However she noted there was some debate before the panel reached consensus on which would be first, second and third.

"The concern about "CityCart" was that it wasn't terribly innovative, and that was probably its biggest flaw," Dawkins said. "But clearly, it came out ahead of everything else."

Lopez and Renard plan to bring the cart to market once they sift through that stack of business cards. For now, they'll focus on the last few weeks of school before graduation and their upcoming relocation to Santa Cruz, California. The designers both accepted positions with Open Innovations, a design and tech incubator they interned with in the Spring semester 2016.

"Everyone congratulated us and they're like, 'Good job! Your hard work finally paid off!'" Renard said. "But this is just the beginning."

(**Guest Editor Note:** Article was originally written April 12th, 2016, SFSU Golden Gate Xpress)

Designing a Better Shopping Experience with a Holistic Approach to Aging in Place

Elnaz Davoudi
UX Designer

Elnaz Davoudi is a UX designer based in San Francisco. Merging user research, strategy and design. Expert in user-centered design and design thinking. San Francisco State University MAIA, Industrial Arts, 2013

Introduction
The population of United States is aging drastically while birth rate is decreasing. Thus the number of people who could potentially take care of the elders is decreasing accordingly. By 2050 the ratio of people 15-64 to those 65 years and over will be 2:1 in the developed countries—comparing to 9:1 in year 2000. Therefore empowering elders to age in the vicinity of their own houses is a necessity of the future world. Studies also signify that relocation negatively impacts elder's health status and suggest avoiding unnecessary relocations in the third age. However, living independently requires elders to be able of doing the daily chores. Today, the inability of some elders to do their routines is not necessarily based on their health status, but on the fact that the products and environments around them are not designed to serve the elderly users. If designed accordingly, many of the current obstacles could be well overcome.

Designing a Better Shopping Experience with a Holistic Approach to Aging in Place

Elnaz Davoudi

Holistic Approach to Research & Design

Aging in place is a complicated subject that involves many interrelated factors. Studying any of these factors as a solo lead can be misleading to the researcher. Instead the designer studies 'aging in place' as a whole system. By applying the proposed holistic model to the design process, the designer intends to grasp the bigger picture and use this knowledge to enhance users' experience through designing a product, service or product-service system. This approach to design will include the elderly as well as the younger users in the design process through a top-down design process. This trans-generational approach to the design process prevents segregating the elderly users from their younger counterparts to avoid stigmatization.

Paradigms for designing the ethnographic research structure

This research has been conducted by a critical, interpretive and social network paradigm.

The critical paradigm

The critical paradigm helps the researcher to use the tools of research to discover inequities and find ways to bring about change in the inequitable actions and policies of the dominant social mindset (LeCompte & Schensul, Designing and Conducting Ethnographic Research, 1999). For many years, elderly users were mostly excluded in design target groups. Currently, most of the products and services have been designed with the young generation in mind. This exclusion leaves the elders unable of using certain products or services while they could well take advantage of them if designed with the elder users in mind. For many years elders have adapted to this lifestyle, simply accepting it as 'how life is', putting the blame on the natural process of aging. This researcher however, does not find this exclusion to be unfair. The goal of this research is to advocate the participants, call attention to their needs and assist them to have access to their equal rights. Therefore, the research will employ a critical paradigm in designing the research plan.

The interpretive paradigm

This research applies a holistic view to the process. The interpretive paradigm of this research requires observing the participants in the context, as this researcher believes meaning can only be created through studying the participants' interaction with the setting. What people know to be true about the world is fabricated by how people interact with one another in specific social settings over time (LeCompte & Schensul, Designing and Conducting Ethnographic Research, 1999). Therefore culture is a relative matter and is created in a process of people's socially based interpretations of what they do. What seems to be true at one time is not necessarily the absolute reality but the mindset of people as to what is right at that moment. The interpretive paradigm of this research challenges the current approaches to the problem. Interpretive paradigm requires the researcher to participate in the lives of the research participants to observe their interaction with setting and extracting the essence of what is really happening (LeCompte & Schensul, Designing and Conducting Ethnographic Research, 1999).

The social network paradigm

The social network theory paradigm is different from what people know as social network these days. The social network paradigm is a model for analyzing social relationships developed in social anthropology (Pattison, 1981) (LeCompte & Schensul, Designing and Conducting Ethnographic Research, 1999). This research provides a view of community that is composed of essentially related individuals. The research does not view the participants as isolated subjects of research but attempts to look at the elders from a broader perspective and study them in relation to the society. The social network paradigm of this research allows the researcher to understand the relationships and association among elders and the society; and study what might influence the development of their social networks (LeCompte & Schensul, Designing and Conducting Ethnographic Research, 1999).

Design of research Structure
Based on the nature of this study and the research paradigms, the researcher chose to employ qualitative methods to develop a data collection plan, design appropriate data collection methods and establish analytic procedures to interpret the data.

Demographic analysis
In this project while the research phase is specific to elder subjects over 65, the design target group is aimed to be as inclusive as possible. The research target group of this project are the elderly, who in United States fall into the category of are people 65 years old and. The goal of the project was to study minimum of 10 elders, preferably with various ethnic backgrounds. Over the course of study the researcher attempted to cover all the three sub-categories known as "young old", "old" and "Oldest old". Due to social considerations the researcher did not require the participants to disclose their exact ages however asked them to confirm if they fall into the defined age category. With the exception of 5 participants of those who attended group sessions, they all confirmed to be 65+. Based on the qualitative nature of this research, the researcher collected the data from the five but made sure that they do not play a major role in the final analysis. It is noteworthy that the data collected from the five was parallel to the rest.

Data Collection
Fieldwork for this study was carried out from March 2012 to March 2013. The study was geared towards cooking experience and aging in place, however over the course of study and after analyzing the gathered data, the research shifted towards the relation of aging in place and shopping in September 2012. During the fist course of ethnographic research, ' group interviews', 'individual interviews' and 'immersive observations' were the dominant methodological procedure. The second phase of the research was mostly focused on 'immersive observations', 'experience mapping session' and 'shadowing'.

Group interviews
The group interviews took place in Alma Via Assisted Living Center of San Francisco. Visits were scheduled biweekly in 5 sessions. The original group was consisted of 4 female and 1 male participants, however at times a few other interested seniors would join the group, too. Each session was followed by a routine of brief explanation of the purpose of research, the significance of their participation and a review of the previous session, followed by informal in-depth conversations around the main themes of the research including; seniors' needs and wishes, obstacles of aging in place, feelings about aging in assisted living, reasons for their relocation, and individual personal stories. The average time of each interview was one hour.

The main obstacles of the group interviews were some participants' degenerative diseases. Hearing impairment made it hard for two of the participants to follow. The researcher would speak up but often the participants could not hear other participants. One participant was dealing with dementia and would not fully remember the previous conversations.

Individual Ethnographic Interviews
The individual interviews were conducted to gain in-depth information about elders' needs and wishes in regards to aging in place. The choice of individual interviews was to provide a less stressful environment of elderly interviewees, so that they can safely share the experiences and reply to the questions.

Total of 5 elders were individually interviewed, two of who were living independently. The other 3 were residents of Alma Via Assisted Living. Interviewing these two groups helped the researcher to have a better understanding of how it feels to move to an eldercare. It also helped the researcher to compare the data collected from those who lived in their houses to the residents of eldercare and draw further conclusions.
All interviews took place in the interviewees living place and when other residents of the place were present. Besides on spot notes, interviews were audio or video recorded depending on the permission of the participants.

Immersive Observations
Immersive observations were conducted to study the subject of the research and the participant in the context. The researcher conducted the total of 5 observations session; one with two residents of Alma Via and 4 with elders who lived independently. In the first phase of research 3 immersive observation sessions were directed when participants would prepare, cook and clean up and make comments on the process. In the second phase 2 observations were made with 3 elderly when participants were shopping. The participants showed and explained day daily style of shopping. The immersive observations let the researcher to see the situations as they happened. It also helped the researcher to observe participants interaction with other people. Observations were a great resource for comparing what people say they do, need or wish and what happens in reality.
The data was collected by means of audio or video recorder. Additionally, some on spot notes and photos were taken.

Shadowing
In the shadowing method the researcher discreetly studied 7 seniors while shopping. Shadowing method was chosen to study the users in the context of use and in their most natural manner. Notion of being observed may have an impact on the research participants. Shadowing the elders without their knowledge allowed the researcher to truly study the subjects' shopping behavior and interactions with others in its outmost natural setting. The most important obstacle in shadowing was devising a plan to study the subjects with out arousing any suspicions. After a few unsuccessful tries of simply following or video recording with a cell phone camera the researcher decided to use a discreet 360 camera that would sit on a cell phone. The video from the 7 subjects provides a holistic view of shopping experience including the relation of subject to surrounding environment, other people and staff. The collected data from this method was a great resource for comparing the findings of other methods to what actually happens in the store.

Experience Mapping Focus Group

The experience mapping session was held with 6 senior participants in less than 3 hours. The structure of this self-designed technique is very similar to focus group with one exception that the moderator does not ask questions or in other words interview the group. Instead the researcher uses pictures to stimulate the participants and allows them to share what counts the most to them. The advantage of experience mapping is that the moderator does not conduct the subject of conversation by posing questions; the participants conduct the session very naturally. The researcher's role is more of an observer than a moderator. Image 16- Experience mapping session.

In order to gradually prepare the participants for the session the session plan was designed into 6 activities. The activities are as follows.

- Stimulation
- Mapping
- Reflection
- Discussion
- Ideation
- Creation

Activity 1: Stimulation

In the stimulation phase the participants were asked to look at 85 pictures posted on the board. The pictures were about shopping and included different parts of the shopping experience. A large group pictures were deliberately chosen based on the data gathered from previous methods. The objective of this technique was to stimulate the participants and drag their attention into shopping experience. Some shopping related cartoons were also included in the pictures to break the ice and put the participants into a relaxed and informal mode.

Activity 2: Mapping

In this phase the participants were asked to choose the pictures that reminded them of positive or negative experiences they have had while shopping and write a short note about the experience on a post-it. They were then asked to post the notes onto the board. The board consisted two separate parts. The top part of representative of positive experiences and the bottom represented negative experience. Some participants posted some picture in the borderline to represent neutral experiences.

Activity 3: Reflection

In this phase each participant was asked to stand in front of the map and explain the reason she/he had used the pictures. They each showed the audience the pictures they chose and shared their insight with other participants.

Activity 4: Discussion

Reflection activity was devised to create discussion among the participants. Numerous times what one participant had to say triggered others to share more similar or different experiences. A large part of the collected data was derived from these discussions.

Activity 5: Ideation

The participants were also asked to think of creative solutions to address the problems they had found. The researcher explained that the ideas do not need to be feasible or realistic. Participants would largely build new ideas on other participants' ideas. The ideation phase was very much similar to a casual brainstorming session.

Activity 6: Creation

In this part the researcher provided the group with different stationary and modeling material and asked each to choose one idea they like the best and make a prototype. The researcher who had made a very poorly-made prototype of a shopping cart before exhibited her idea of the next shopping cart and asked the participants to make a prototype without being concerned about the aesthetics of it. The shopping cart was made specifically to show the participants how easy it was to make a prototype and make them feel comfortable in making their prototype. Despite all these actions the participants seemed very reluctant to the idea of making a prototype and discreetly refused to do so by changing the topic for a few times. The researcher respected their hint and did not insist on performing this last step.

Data Analysis

Data analysis allows the researcher to discover patterns and themes that can be associated to other patterns and themes in the research (LeCompte & Schensul, Analyzing and interpreting ethnographic data, 1999). Data analysis is a critical step to the final interpretation. In this project the data analysis happened in 5 levels.

- In-the-field inscription
- In-the-field description
- Transcription
- Coding
- Fine tuning results

Inscription

Inscription is a form of in-the-field analysis that is consisted of words or phrases that highlight the significant point of the data for further investigation (LeCompte & Schensul, Analyzing and interpreting ethnographic data, 1999). The researcher used inscriptions as mental notes that capture the moment until she found time to write down the descriptive data.

Description

Descriptions are comprehensive notes on events, behaviors, conversations and activities that assist the researcher to create a portrayal of the participant and provide a coherent representation of the observed culture. Descriptions usually become more focused and objective as the research advances (LeCompte & Schensul, Analyzing and interpreting ethnographic data, 1999). Shortly after each ethnographic research session, the researcher documented a preliminary analysis that included initial interpretation of the data and the researcher's insights.

Transcription
Since most of this ethnographic research was recorded by audio or video the researcher had the advantage to capture all the details. The important parts of the files thereafter where transcribed for later use. Transcription also included documenting non-verbal data.

Coding
The volume of data in ethnographic data can be overwhelming at times, making it very hard to conclude. Coding helps the researcher to categorize and condense the data to the point that ideas, themes, patterns and structures become apparent (LeCompte & Schensul, Analyzing and interpreting ethnographic data, 1999). To this end the researcher read through all the notes and assigned categories and themes, looking for certain patterns, behaviors, ideas or categories that occur repeatedly in the data. She used descriptive words to represent each category and studied the relative frequency of each category.

Fine-tuning results
In this part of analysis the researcher looked for coherent relationships among the most repeated patterns and themes. As the outline and contents of the analyzed data became more distinct, a clear portrait of the subject of study appeared. A quick review of the theoretical research paradigms and the research questions plus the collected quotes and data, assisted the researcher to see the bigger picture and create a conceptual framework of what was discovered.

The fine-tuned results
In many ways findings of this research is a confirmation to the existing literature. Most of the physical needs that the elderly are facing today and their aspires have been mentioned in some studies as old as 40 years. What stands out in this study is its social approach to the shopping experience and aging in place. In this project the researcher does not consider elders as isolated individuals but as part of a social network and rigorously attempts to capture the emotional and social aspects of shopping.

Based on the analysis of the empirical data gathered, the researcher identified two main categories;
- Physical needs and wishes
- Social and emotional needs and wishes

Physical needs and wishes

Choice of store and timing:
Findings exhibit that most elders prefer to shop at one or two specific local store. They usually try to avoid shopping in weekends and the busy hours. Instead they mostly preferred to shop on weekday mornings when most people are at work. They showed interest in shopping at a store that has a good balance between quality and price. This was also seen in the literature. A group of elders preferred the stores that were relatively small but had a wide array of items. They found some stores to be too large with too many choices. These participants exhibited interest in shopping at a store with fewer, but better choices.

Carts and baskets:

Several comments regarded shopping carts and baskets. Some elders found the majority of shopping carts to be too deep; requiring them to bend and stretch to reach the products. This issue was consistent with the data from shadowing method. Some found the carts to be too large and hard to handle. The videos from shadowing confirm this statement; especially in the cases where there were pillars in between the aisles some difficulty and slight hitting incidents were observed. Most of the elders stated a better experience with smaller carts especially since they did not buy a lot each time, due to smaller households. Elders' choice of using a basket or cart was very different. Some preferred carts because they could lean on them and use them as an assistive instrument. One woman specified, "I will always use the cart, even if I want to buy very few items, because I can lean on it, specially in the long check out lines. They should think of a bar or something for the customers to lean on." On the other hand some preferred baskets because they were not interested in pushing the carts around the store when they had little to buy or as one participant puts it used it as a scale for how much they should shop. "I used to take the carts but then I would get out of the store and not know how to take it home. So now I will always take the baskets. As soon as the basket gets heavy enough I know that I should finish shopping."

Some participants used their own personal cart to carry the shopping bags from store to home. Some suggested having a shopping cart that could be carried from home to store, used in the store and carried back home; in order to save the bending and stretching to take out the items and put into their personal carts. In general a considerable amount of data regards shopping carts and baskets. There seems to be a great potential for re-designing these products to provide elders with a better shopping experience.

Food packaging:

Another frequent complaint was about packaging. Many participants asserted that the portions of the packaged food were too large for them. They were not content about having to buy more than they need. To avoid waste each had come up with their personal style of maintaining or using the food. The most common approach was to divide the food into smaller portions and freezing it. The issue of large packages was even more evident when it came to foods like meat. The participants expressed a negative feeling towards letting the complete package taw in order to be able to divide it into smaller portions, and freezing it again. The proposed solution was to freeze pieces of meat individually. A remarkable group of the participants declared that a large group of packages are hard to open. Frequent examples of this issue were resalable plastic bags, jars and packages similar to chips bags.

Labels:

Labeling was another significant issue of old adults. Most of the participants found the print on the labels to be too small. Some participants revealed that they do not read the labels in the store for that matter. While a participant minimizes the gravity of this issue by saying, "I do not need to read the label. I know all the information by heart"; others mainly agreed that they are interested in reading the labels but as one participants puts it are, "embarrassed to take out my glasses to read a label and no matter how far I take the package from my eyes, there is no way I can see".

The issue of labeling has been mentioned in the literature many times from 1970's to present. According to some participants, not all the information on the price tags is legible for elder customers. They desired a price tag that specifically notes the unit price with large fonts, so that they can compare items together.

Checkout lines:

A significant number of the participants expressed negative feelings about standing in line. They demanded a place to lean on when standing in line. Most of the participants stated that they usually use the express line, where people have fewer items. Some participants would plan their shopping schedule around the hours when they knew the lines would be short. One participant says, " I usually avoid weekends. If I go shopping and see the lines are crowded I will try to finish shopping as fast as I can so that I can still wait in the lines. I have had some cases when I just left the store because I did not want to stand in long lines for buying a few things. Even the express lines are as fast as they should be."
Most of the elders had similar reactions towards using self-checkout lines. Most of the research participants preferred to stand in conventional lines rather than using the self-checkout lines. With the exceptions of a two who said they use the service when they are in a rush because the waiting time is shorter; elders did not find the machines to be faster then regular lines. Some mentioned that the lines look shorter but the time it takes people to figure out how to use the machines outweighs the regular line. Many reported to have been very confused by the instructions of using the machine. Most of those who had tried the self-checkout service mentioned being confused to the point that the intervention of a staff was necessary. Some people stated that they simply enjoy the short conversations with the cashiers; something they could not find in the machines.

Shelves and Location of Products:

Difficulty in reaching the top and bottom shelves was also a noticeable complaint. Similar to the issue of carts, some research participants found it hard to bend or stretch to reach these shelves. One participant also commented on the relation of the weight of the items in the store to the shelves where they are located. She elaborates, "I do not feel safe when I want to take a heavy package from the tops shelves. The heavy items should be located on the mid-shelves, easily within the reach of customers. They should be where you have the most control."

Size and layout of the store:

As noted in the beginning of this part, some participants found some large stores to be too large for the elder customers. They pinpointed the extensive amount of energy one should put into finding all the items on the list from different parts of the store. They criticized having too many choices for each item; instead they desired fewer choices with better quality and fair pricing.
One major complaint of the participants was about regular changing of the location of items. Parallel to literature, elderly customers found this relocating to be confusing and waste of their time and energy. Some said they had sometimes encountered new items that were better what they were used to, because of this relocation but most of them also mentioned that they would rather know about a new product through tasting than extra trip around the store.

Social and emotional needs and wishes
While one would imagine shopping experience to be more of a physical act, social and emotional aspects of shopping frequently came up in this ethnographic research. The research revealed some usually ignored inner emotions about social life that will be elaborated here. Based on the common themes found while data analysis the researcher presents following categories:

- Nostalgia
- Social Interaction
- Respect
- Integration

Nostalgia:
Nostalgia was a very strong theme of the research. Often time elders were talking about enjoyable memories of the past and drew comparisons with the existing situation. The need was sometimes expressed in more subtle way. "We had a personal relationship (with the seller) who had good information (about the food being sold). We had high quality food". Sometimes there were direct references. "Our age group are trying to pull back in time to what we grew up with". Having personal relationship with the seller was one of the main nostalgic themes that came up frequently.

Social Interaction:
The results disclosed a strong sense of desire for social interaction. Shopping experience in United States was often compared to the same experience in other countries, pinpointing the absence or scarcity of social interaction and leisure activities incorporated with shopping. "In Europe the social aspects and leisure aspects are much more integrated with shopping experience" or "Design should lend itself to create an environment where you want to sit and have fun" and "I like to go to a shopping center were I can sit and sip on my coffee while looking at people running around" or "In Europe you see so many people sitting and having meals together right in the middle of malls. The restaurants and coffee shops are woven into the structure of malls". The research participants clearly wanted a social and fun shopping environment.

In some occasions the participant regarded shopping experience as a way to manage loneliness. " People who come into a new city, they don't know anybody. Sometimes it is very hard to meet people" and "it is also part of the routine that you have. No matter what, you will go to store every week". In several occasion stores were mentioned to be a great place to meet new people.

The participants showed plenty of desire for having personal relationship with people working at the store. They wanted to have a relationship based on familiarity and trust. They liked to personally know the seller they buy from and wanted him to know them personally and be familiar with their preferences. "Old days you used to have your butcher and they knew you for years" or "He (a seller in the past) knew our preferences. We did not have to tell them what we wanted. He already knew".

One of the participants in the experience mapping sessions puts a lot of emphasis on personal face-to-face relationship when she is talking about her idea of a new way of delivering food to elders, "This way you go to the chef. You look him in the eye" or "the (the chefs) get to know the customers so much that because they know the person they decide to put more carrots and less spice (in the package)".

Similar to what literature suggests the senior participants enjoyed special treatments. One good example of this is when one the participants explains how their butcher from old days would try to please them based on their personal relationship saying, "There is nothing (desired meat) here but let me see. I have something down here".

Trust and advice are also two prominent factors observed in the ethnographic research. Looking for advice, may it be on cooking; finding the right item or best quality food was one of the recurrent topics. "I would ask the guy (grocery seller) to give me the sweet ones (watermelons)". Trust and advice were used hand in hand. There seemed to be a relationship between how much the customers knew the seller personally and how much they trusted them and took their word. "He (the seller in the fish market) would provide recipes as to how to cook the seasonal fish".

Respect:
Another recurrent element that could be extracted from the ethnographic research was an inner demand for respect. Concept of respect was used many times in the conversations. " Once I was so tired and the checkout line was so long. The young lady in front of me noticed. She offered me to go first. She said she was in no rush. I liked her attitude very much. I wish all young people were like her". Another time a lady says very unexpectedly her experience of pleasant respect she and her husband received from a younger man. She explains how a Japanese young man on an international flight automatically took their carry-ons from them and fit it in the over-head bin. She then continues, "Wow! Can you imagine that?! I had lived here for so many years I forgot what it means to be respected back there (Asia)". The concept of respect was one of the prominent elements of the ethnographic findings. Seniors never stated to need to be respected but they viewed it as a very pleasant experience.

Integration:
Almost all the participants has consensus on the importance of generational integration. Some would express their feelings towards segregation very calmly, some very strongly. "I do not like to only talk to old people. Old people keep talking about their pains and medication. I would rather hang out with young people" versus "I hate the idea of segregating the aging population (at the self-check out line) intentionally. I would rather see an intergenerational force to the system to enhance integration." Although the tones might be different the concept remains the same. Longing for an integrated society was expressed in many different ways. One interesting example of these comments is when one of the participant's comments on the small cars designed for the children to play with while parents are shopping. "I don't like those cars. I believe kids should be closer to their guardians… not separated from the experience of shopping."

Interpretation:

The main motivation of the study was to study the issue of aging and forced relocation. Based on the general purpose of the research, the study persisted in investigation on how to redesign the shopping experience in order to facilitate aging in place. The questions and sub-questions were defined. Existing literature was studied to learn the current knowledge of the matter. Qualitative research methodology was chosen based on the nature of the research. Three paradigms were chosen as guideline to the researcher. The paradigms include inclusive or 'critical paradigm' that investigates inequities and advocates design for aging to as a right not a privilege, this paradigm; holistic or 'interpretive paradigm' which encourages the researcher to look at the bigger picture and study the research participants in the context of their environment plus 'social system paradigm' that considers the research participants as part of the society not as isolated individuals.

Several methods were employed such as group and individual in-depth interviews, immersive observations, shadowing and Experience mapping session. By means of these methods it was conceived that elderly face several physical challenges while shopping. These challenges are mostly due to their physical decline, are mainly coherent with the existing literature most of which have not been responded for many years. The main areas of concern were the large size of food packages, standing in long checkout lines, reading the labels, using the carts and baskets, size and layout of stores, shelves and location of products.

The study showed a very social aspect to shopping experience. Participants found shopping to be an experience than can be fun and social. The nostalgia from old ages and existing cultures around the world were two main sources of comparison for the elders. Elders showed to be very perceptive of personal social interactions of them as customers with the seller or store staff. They desired to personally know the staff and be known by them. They liked the staff to remember them and their preferences. They looked for a personal relationship with the staff; one that helps building trust in both parties. They also liked to make conversations and take advice from them on which food to buy or how to cook a special dish with the food and more. Talking of advice was always hand in hand with 'trust'. Findings showed that the seniors associated the personal familiarity with the seller and making regular conversations with him to sense of trust towards the seller.

The general view of shopping environment was an environment for shopping, having fun and social interactions. They were specifically enthusiastic about communicating with the younger generation and truly appreciated the young people's patience when they needed more time to learn.

The participants liked to be specially treated, not in a manner that suggests they are not capable of doing it themselves or that they are old, but a special care based on friendly relationships and respect. Care and respect were two major phenomenon linked to this behavior.

The study revealed that seniors love to be respected. The desire for respect did not seem to arise from an egotistical behavior, but a feeling of being recognized for their wisdom they have gained through years. The seniors loved to be viewed as a intelligent characters and treated with high levels of dignity. They loved to feel being cared for. This was obvious from their statements through the research and behavior towards the outside world and the researcher. The researcher found having sincere respect and being genuinely honest and kind to the senior participants of the research, to be her main key to success in communicating with them.

Approach to Design Solution
The findings of the research showed a very wide spectrum of physical, social and emotional needs and wishes. Most of the physical needs have been greatly highlighted in existing literature however there is very little attention paid to aging adults' social and emotional needs. Based on this finding and the social network paradigm of this research, the designer of this creative work project chose to focus on social needs and wishes of aging adults. The designer made an effort to find a way to strengthen aging adults' social networks in the neighborhood, naturally and effortlessly.

<ins>New Design problem Statement</ins>
Scenario #1: Most aging adults prefer to age in the comfort of their houses independently rather than having to be relocated to other headquarters. One of the factors that can help elders age in their houses is having a strong network of people who can support them when they are in need of help, specially during temporary sicknesses or accidents. How can we bring older adults of the neighborhood closer together through shopping experience?
Scenario #2: Most aging adults prefer to age in the comfort of their houses independently rather than having to be relocated to other headquarters, however often the house can be too large, making it hard for an aging adult to live in and maintain. Therefore some elders decide to downsize to a smaller house, which may lead to living in a new neighborhood. Literatures exhibit that elders' health decline each time they relocate. Stress, isolation and grieving of relocation contribute to adults' overall physical and psychological decline (Maag & Krisztal). How can we bring new aging adults of the neighborhood closer to others through shopping experience?

Research Finding Used in the Final Concept
Studies suggest that having a strong network of supporting people can contribute to individual's health, which is one of the main factors of aging in place. Also a strong social network can support elders when in need and allow them to age in their houses for a longer time. On the other hand the findings of this research illustrated elder shoppers' interest for having a more social shopping experience. They mostly viewed shopping as an experience that should have more fun aspects to it. The most significant related concepts were respect, feeling of being taken care of. The participants liked to personally know and be known by the staff. They liked to receive customized advice from the staff and found the staff's notion of customers' preferences to be an ultimate sign of care. They paralleled trust with personal notion of the person. Concepts of trust and advice were often used together.

One of the prominent findings of the research was elders' discomfort when standing in long lines. Some had to physically strain while standing, finding leaning on the carts to be the only option to alleviate the hardship. Also, over the course of study a few times people brought up the idea of a resting area where they could sit for a while and take a breath. The combination of these findings led the researcher to design a service to address the mentioned issues. The service is called, "Valet Checkout".

The Design Narrative

Based on the factors mentioned above the designer designed a new service to bring new and old aging adults of the neighborhood closer to others through shopping experience. The service also responds to seniors' desire for being respected and known to the staff, being cared for and receiving appropriate special treatments and having a more social, relaxing and fun shopping experience.

From business point of view it is predicted that the service can generate more loyal customers. From the social standpoint the service aims to create a context in which aging adults can meet neighbors living in the same neighborhood and shopping in the same local store.

Here is the story of Joe, a retired senior who just moved into the area 2 weeks ago, 3 years after losing his spouse. The story explains how Joe found friends in the neighborhood and helped Gabby to continue living in her home.

The Valet Checkout Service in brief

The valet checkout service (VCS) is a service that does not require the costumers to stand in lines to checkout; instead VCS creates a better shopping experience for costumers by allowing them to sit, sip their drink and enjoy chatting with other costumers while waiting for their receipt.

Feedback

To gather feedback the researcher devised one survey to collect aging adults research participants' opinion about VCS and another survey from general population shopping in stores to have an understanding of the general reaction to the idea of having a valet checkout service. The results are as follows.

In this step, the researcher defined the Valet Checkout (VC) service to 12 aging adults and asked them to answer to a short survey.

In response 1/3 of the participants stated they will always use the service given the VCS exists. Almost half said they might sometimes use the service while 11% showed no interest in using the service. Almost 20% of the participants declared that in their opinion the service will definitely catalyze conversation among the customers while 77% believed it might encourage conversation. In response to the possibility of creating friendships among the customers that last outside of the context of store about 44% had a negative opinion a little more than half of the participants found it likely to happen. When asked about their general idea of implanting the VC service in the stores, 88% found it to be a great idea and the rest viewed it as a relatively good service. Some participant share their concerns or suggestions

about the valet checkout service. The main question was about the money transaction. Participants liked to know specifically where and how they pay. One participant was concerned about coupons and how they can be used in the VC system. Two participants suggested a permanent cashier for VC line who can is welcoming and friendly

Prototyping

To gain a better understanding of how the valet checkout system works the researcher prototyped the service. She then noted out areas of problem and suggested solutions to improve the experience. The researcher's first goal was to prototype the service in a grocery store, yet due to liability issues could not get permission to do so. Therefore, she replicated the checkout point in a different area and assigned roles to actors and actresses. The prototyping process showed a series of issue, which should be considered in designing the experience.

Findings of the Prototyping Activity

The prototyping activity helped the researcher to understand the issues in the designed service through roleplaying the VC service; starting from when a customer puts a shopping cart in line to when he is ready to leave the store. The role-play revealed several problems in the designed service.

1-Name tag: How does the costumer identify his/her cart from the rest of the customers?

Sub-problems: In case of requiring a name tag where does the customer get one? In case of requiring writing down his name, where does he get the writing tool? In case of having to attach a nametag to the cart, where and how does the costumer attach the nametag?

2-Shopping cart should be carried to the customer to provide him/her the choice of using one. This was not predicted in the original idea.

3-One aspect that was not predicted in the original idea was the fact that the receipt needs to be printed after the transaction is completed.

Sub-problems: How does the receipt get printed after the transaction? Is there a necessity for printed receipts? How does the information from the scanner transfers to the card reader? What if the costumer changes his/her mind about one product?

4-Dragging the carts: There will be a gap between the carts, after the cashier drags the one in the front towards himself. The gap between the first and second cart might be negligible, but becomes a real issue when there are more than 2 carts in line.

5-Cash transaction: When doing cash transaction the staff member who delivers the service should carry change with him to the resting area. The cash should be organized and easy to reach.

Final Design

Based on the findings of the role-play prototyping session the original design of the service morphed into a more practical design. In the new service the resting area is located right after the valet checkout line and allows the cashier or staff member to call the customer to the checkout point after scanning and bagging all the items. In the new version of designed service all the money transactions take place at the cashier's desk, which is located very closely to the resting area. In this model the customers will still find the chance to omit or add another item effortlessly or use their coupons. If the cashier's desk is located close enough, customers might even be able to do the transaction while seated.

Conclusion

Literature suggests that healthy and independent aging relies on more than merely medicine and elderly-friendly environments. Social support is another major contributing factor. Studies have shown that a strong social network of support can directly contribute to one's health. People can also provide assistance to each other when in need, preventing the force to relocate for further assistance. A great example of this model is the 'Village' movement; a neighbor-help-neighbor system that allows old people to age in their home and community. This research showed that elderly shoppers have many physical, social and emotional needs and wishes when it comes to shopping experience; including spending less physical energy on standing in long check out lines, a sense of nostalgia and desire for rich human interactions at the store such as a sense of familiarity and respect by staff. Elder shoppers loved to be known and respected by the staff and regarded it as one of the most important factors that is missing from their current shopping experience. One went to the extent of describing the experience as "cold & mechanical".

The final design allows costumers to use their physical energy more efficiently for picking the items of their choice by avoiding standing in line through valet checking out service (VCS). VCS can also address some emotional and social needs and wishes of elder costumers to create a better shopping experience. Customers can relax and enjoy talking to other people and maybe make some social connections that is a contributing factor to again in place, by possibly meeting and connecting with other costumers that are likely to live in the same neighborhood while waiting in the sitting area. Having a set schedule for cashiers at VCS line will facilitate forming social connections between costumers and cashiers through repetitive interactions with same costumers and provide an opportunity for a richer human interaction between costumers and staff. Calling costumers by name after scanning and bagging stages will provide a more personal and friendly atmosphere and a sense of familiarity. In general the goal of the service is to create a sense of being respected and taken care of, and bringing back the sense of nostalgia that elder shoppers mentioned they

miss in so many occasions during the research, while allowing shoppers to spend their time and full physical energy on choosing the items they needs rather than shorting their trip to leave some time for standing in line, as some costumers had mentioned to do in the research phase. To avoid segregation or creating a negative connotation, the service is geared towards general public.

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Thermoring: A Safety Feature for Old Electric Stoves

Research project aimed at empowering older adults through design solutions

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Kayvan is an independently motivated and innovative Industrial Design and UX Designer. He has lived, worked and researched in the United States and abroad. He has a B.S in mechanical engineering and a MAIA in Industrial Design. He is creative and curious about people-product interaction and consumer habits with a comprehensive knowledge of universal design principles. He has researched and conducted projects in the area of cooking experience for seniors, bridging the education gap for developing countries and wearable technology relative to designing a better awakening experience for couples.

Problem Statement

Seniors are at high risk of accidental burning. According to US fire administration adults in the age group of 65 and over have a fire death chance of twice to four times that of the national average. Fires caused by cooking are the leading cause of fire-related injuries in the elderly. This study correspondingly revealed 'fear of fire accidents' to be a frequent reason of elders relocation to assisted living centers. Cognitive impairments such as dementia, decline in tactile sensory perception, diminished visual acuity, hearing, smelling, deficits in mobility and balance all add up to put the aging population at a risky situation when it comes to cooking.

The old electric stove, lacking proper visual sensory feedback is a dangerous product to interact with. Incidents such as melting and burning of cutting boards, plastic utensils and cords on the electric burner are not scarce. Although electric stoves are mainly safer than their gas counterparts, they can be a serious source of danger in the event that the burners are hot but have not lit up, which increases the risk of being mistaken as a cold burner. Thus, visual sensory feedback can play a vital role in reminding the user of a hot object. This problem is addressed in newer stoves, yet plenty of people are still using the older models, many of whom are not in the habit of upgrading.

Importance of Design for the Aging Population

The fact that people are getting healthier has gradually changed the demographics of the population in developed countries. The proportion of the elderly is steadily increasing worldwide as a result of the improvement in medical care. An estimated 10.3 % of the world population is currently over the age of 60 and this will increase to 15.0 % by 2025, whilst in 2030 almost half of the Western Europe's population would be at 50 or older (Pollack, 2005) (considering elderly, 2009).

In US, we are currently at a time where the first baby boomers have reached the traditional retirement age of 65 (in 2011). At 2030, baby boomers will comprise about 20% of the total U.S. population, ranging in age from 66 to 84 (ASID, 2008). While many older adults will remain healthy and productive, overall this segment of the population is subject to physical and cognitive impairment at higher rates than younger people. Seniors' ability in perceiving their physical and social boundary alters as they experience sensory changes. All the five senses -sight, hearing, taste, touch, and smell- gradually decline in sensitivity.

Sensory losses occur among individuals at different rates (Hunter, Sayers, & McDaid, 2007) (Siek, Rogers, & Connelly, 2004). Vision and hearing problems may emerge early in life for some of people, while others save sensory capacity well into the sixth, seventh, and eight decades. At the same time, individual sensory abilities may also change. One can, for example, have poor eyesight and good hearing while another may have good eyesight and poor hearing (Simsekkan, 2006). Therefore, this variation may appear at different ages for different people. People tend to solve for the loss of one sense by relying more on the senses that remain. For example, people with hearing loss unconsciously begin to sight-read lips. Consequently, it is important to consider the combined effects of multiple losses while products are designed

The change in demographics poses both a challenge and an opportunity for the design of empowering solutions. People's independence and satisfaction has a direct correlation with their freedom of choice (Elderly people and design, 2009) (Simsekkan, 2006). The approaching wave of wealthier, healthier and more independent Boomers is reframing the discussion of elderly needs. Therefore, designing for the elderly has become an issue of great importance at this particular time. In relation, the designers are facing an unprecedented challenge fulfilling the distinct and sometimes unfamiliar needs of the senior users.

Elderly and Cooking

Cooking can be beneficial for the elderly from several perspectives. First is the issue of self-esteem and independence that can be reinforced through activities such as cooking and has a direct effect in older adult's quality of life (Elderly people and design, 2009). A well-balanced, nutritious diet that includes adequate fiber and fluid intake is necessary to uphold the elder's health (Nation- al Institute on Aging, 2008) and cooking at home can certainly help achieving that. It also contributes to creating a rhythm and occupancy in the life of those who have abundant amount of time to spare on leisure activities (Elderly people and design, 2009). As an activity that includes multiple steps, cooking can help keeping a person's mind sharp. As a mild physical activity, cooking can delay declining of the muscles and assist keeping the mobility. Cooking can also lead to a social activity when one decides to share the prepared food with friends and family (McGuire, Boyd, & Tedrick, 2009).

Methodology and Findings

Research framework was based on IDEO's HCD Toolkit. The researcher took advantage of some of the methodologies presented in the HCD toolkit, while also enhancing the study with other methodologies that were relevant to the problem at hand.

Research started with literature review and exploring various problematic areas within the cooking process. Based on a holistic approach, cooking was observed as a composite activity, that is, a combination of various tasks each embodying interaction with various products and environments. These tasks were categorized into: Shopping, Storing/accessing food, preparing food, eating and finally cleaning up.

To gain better empathy with the possible target users the author used various resources to interact with seniors and individuals with special needs at different stages. These meetings have been conducted in the form of focus groups, interviews, and participatory activities. The following is a number of selected research phases that has led to synthesizing a problem statement.

Observing a Cooking Session (in-context immersion).

The researcher participated in a cooking session held for residents at Alma Via Assisted-Living Community of San Francisco. Betty and Ada were preparing a soup with the help of Sister Caitlin. The researcher spoke to the participants asking about their approach to cooking while also observing how they had difficulties chopping and peeling the vegetables. Throughout the session they stayed away from the hot boiling pot; leaving Sister Caitlin to deal with it (Images 1 &2).

Expert Interview and Cooking Observation with Sue Siegel.

As a Universal Design advocate and the founder of Hearth homes in Berkeley - a universally designed affordable living facility- Sue Siegel has had years of experience with the older community. The researcher conducted two interviews with her focusing mainly on the cooking experience, while also observing her prepare a meal (image 3). Problems such as safety, the challenges of cooking for one and convenience of an easy to prepare meal where brought up more than others.

Image 3: Interview and cooking observation with Sue Siegel, a designer and Universal Design advocate, at her house

A visit to the University Neighborhood Apartments (UNA).

Along with class (DAI 805), the researcher paid a visit to the UNA apartments in Berkeley, participated in a group discussion with some of the residents and followed into an individual interview with one of the residents at his house (image 4).

The researcher found out about some of the resident's personalities, interests and preferences. For example Brian was into music and Beverly liked to barbecue outside but she couldn't due to UNA regulations. The author identified problems in their living space and was enlightened about how cost effectiveness can play a part in universally designed living spaces.

Synthesis

Findings from the hearing stage shed light on a series of problematic areas that were categorized into five sections: Issues with cost, the need for social interactions, accessibility and safety. The spectrum of problems found were overwhelming at first and the researcher soon found out that there is no remedy that can answer all these diverse needs. The author chose to focus on safety as it was the main reason for senior's relocation to assisted living facilities.

The researcher rephrased my challenge into "How can we provide a safer cooking experience for older adults?" And delved deeper into the cooking process. The author sketched various storyboards and broke down the user-product interactions that take place in the kitchen. The researcher found that old electric stoves can be a series source of danger as there are many potential scenarios where one can accidentally burn themselves or cause fire hazards

Design

The researcher conceptualized a range of different ideas that ranged from high-tech cooking devices to off-the-shelf solutions that could prevent accidental burnings on older stoves. There is evidence in literature that older adults are not keen to sudden changes in their surroundings (Elderly people and design, 2009), in most cases, they also need more time to adopt to new technologies (Tang & Kao, 2000) (Leonardi, Mennecozzi, Not, Pianesi, & Zanzanaro, 2007)(Hunter, Sayers, & McDaid, 2007). So instead of designing a new cooking machine, the researcher chose to concentrate on simple solutions that would make the current stoves safer. Therefore, the idea of designing a warning device that could easily be obtained as an accessible safety feature for older electric stoves was born. The researcher created various simple mock ups (image 5) based on the idea of incorporating color changing properties of thermochromic dies into a warning device. After a round of design evaluation together with a group of seniors at Alma Via, the shape of device was finalized   (image 6).

Thermoring is designed for everybody, especially older adults who suffer from decreased mental acuity or those experiencing lowered temperature sensitivity. It is a thermos-chromic ring that warns the user if the surface of an electric stove's burner is hot, by changing color from black to red. The ring features a layer of magnet underneath that makes it easy to install by anybody. Thermoring does not need extensive user manuals. It is meant to be affordable and very easy-to-clean. The most important quality of Thermoring is its ability to show whether the burner is hot or cold, compared to just indicating whether it is on or off. This is specifically important in case of older adults with lower temperature sensitivity, allowing them to avoid thermal injuries. Images 7 and 8 illustrate how Thermoring works.

Thermoring is made from silicone and mounted on a layer of magnet sheet. Silicone wad used for heat resistance, flexibility to adapt to different stove models, resistance against oils and easy cleaning. Magnets are used for easy installation and removal for cleaning. Developing this concept into the optimum product requires careful experimentation with different pigments, types of silicone, product thickness, ring diameter and the exact percentage of each material part used in casting.

The optimum product would be one that changes color with minimum delay time, displays black color when cold and goes completely red when temperature rises above 70 degrees Celsius. http://youtu.be/3Ohq6MVf2SQ

ThermoRing Presentation Video:https://www.youtube.com/watch?v=U7Q9XnCMEs8&t=625s
(video: courtesy of the Stanford Center on Longevity/Aging 2.0)

Image 1: Observing the challenges of two older adults while cooking. Due to arthritis Betty had tremendous difficulty peeling and chopping the potatoes. Ada seemed to be OK with preparing vegetables but preferred to stay away from the stove.

Image 5: Prototyping with double sided tape to explore different possibilities in form and attachment methods.

Image 6: Design evaluation session at Alma Via of San Francisco, CA.

Image 7: Prototype made of silicone rubber is changing color from dark brown to red.

Image 8: Thermoring when hot (ON) and while it is cold (OFF). Computer generated image.

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Improving the Eye Drop Experience

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Improving the Eye Drop Experience

Trevor Myers, M.A.I.A.

The goal of this creative work has been to improve the use of and ease of identification of eye drops. As our population continues to grow and life expectancy increases more focus must be given to improving the quality of life of seniors and others with limited sensory functions. In order to reach as many users as possible the design process has taken a user-based design approach, incorporating universal based design principles whenever possible.

The Problem

Current eye drop bottles contain critical ophthalmic medications; yet they may be difficult to use, identify, and store. Awkward bottle design makes it difficult to dispense medication and even aftermarket aids have not fully solved this problem. Eye drop bottles frequently look the same, leading to confusion in use and storage as well as confusion with other dropper bottles. For example, toxicology experts note that, "accidental administration into the eye of non-ocular pharmaceuticals is common and has remained relatively constant over the past seven years. Further research and revision of product design and packaging needs to be performed to help prevent these therapeutic errors."1 Taken together, this constellation of problems indicates an urgent need to revisit eye drop bottles and packaging in order to provide safer, more accessible eye drops for the general population, whether for occasional or daily use.

Points of the Constellation of Problems

Medication errors
A medication error is defined as "…any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing; order communication; product labeling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use.(NCC MERP -- About medication errors., n.d.)

It has been estimated that "…the average hospital patient is subject to at least one medication error per day and that each year more than 1.5 million patients have injuries resulting from preventable adverse drug events." (Burke, J. P., 2007) It is significant to note the high number of errors even under trained medical staff in proper conditions. Once patients are sent home and have to care for themselves the number of errors could significantly rise.

In 1994 the Institute for Safe Medication Practices (ISMP) started a voluntary error reporting agency where practitioners could report these errors in hopes of preventing their

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reoccurrence. (Institute for Safe Medicine Practices, n.d.) Thanks to the efforts of the ISMP, and other agencies like the Institute of Medicine and the National Coordinating Council for Medication Error Reporting and Prevention we can now use their reports to help design better products and systems for medicine delivery. There are many steps in the medication process and any one of them has the ability to cause confusion and harm. Problems can range from a doctor's poorly hand- written prescription, to a pharmacist unknowingly selecting the wrong medication even before it gets into the patient's hands. For example the administration of "unauthorized or wrong drug" are two of the most frequently reported medicine errors. (AAEEH, et al, 2005)

Labeling errors

Medicine errors are a large and diverse problem. If we focus in on labeling errors, we see that they alone are a significant cause of medication errors. According to the American Hospital Association, "Lack of appropriate labeling as a drug is prepared and repackaged into smaller units" is one of the top six contributing factors to medication errors. (AAEEH, et al, 2005)

Specific to eye drops

According to operators at the California Poison Control System, non-ocular pharmaceuticals being used on the eyes is a relatively "common problem(Operator, CPCS)". Examples of such an error might be, squeezing superglue, nail fungus medication or ear drops into the eyes, due to the similarity in shape of their containers and/or difficult to read labels. The problem of misidentification is not just with standard size eyedrop bottles. Even single-use containers of allergy medications and superglue have been confused by patients. In 2000, a 43 year old woman in Israel mistook a single use container of superglue for her allergy medication. She was at home in a dimly lit room and could not tell the difference between the glue and the eyedrop bottles. She ended up cutting off her eyelashes at home before getting treatment for mild corneal and conjunctival erosions at the hospital. (Leibowitz, E., &

Levartovsky, S., 2000) Examples are provided in Figures 1and 2 that show the similarity of eye drop medications and similarly packaged super glues.

Left: Figure 1. Similarly packaged super glue and eye medication image source: Dean Ann Hallum

Right: Figure 2. Similarly packaged super glue & eye medication. source: Br Med J (Clin Res Ed). 1984 Jul 28; 289(6439): 226–227

Cataracts and cataract surgery

Cataracts cause patients eyesight to become cloudy and many have surgery where their corneas are replaced with clear new lenses. After this procedure they require multiple eye drops to aid in their recovery. Keeping track of the medications is important to ensure proper recovery. Cataract surgery is becoming a more common procedure with "…more than a million such surgeries performed each year." (Shoemaker, 2008) Cataract removal, as of 2008, was the most commonly performed surgical procedure. Cataract surgery is not a complete cure. Patients leave the hospital with a regiment of eyedrops they must follow. It is possible the surgery may not take, infection can set in, and sometimes outpatient treatments can be costly and complicated. "It is estimated that the direct annual medical costs for outpatient, inpatient and prescription drug services related to the treatment of cataract total $6.8 billion." (Shoemaker, 2008)

Glaucoma

It is estimated that 120,000 of the 1.5 million Americans afflicted by glaucoma are now blind because of the disease. (Sleath et al., 2015) That accounts for 9-12 percent of all blindness cases in the United Sates. One of the main ways to prevent blindness due to glaucoma is to reduce the intraocular pressure through medicine delivered via eye drops.

This makes adherence to a highly regulated schedule of delivery paramount in preventing blindness. In addition to keeping to a schedule it is very important to take the correct medication at the correct time. If one accidently substitutes a medication that does nothing to lower the eye pressure, over time, damage can occur. Glaucoma patients not following their doctors prescribed regimen is currently a problem. This issue is naturally exacerbated when a patient is given a more complex regimen, which causes patients to miss doses and/or to take them at the incorrect time. (Sleath et al., 2015) This issue shows a need for better doctor-patient communication, but also a better system for patients to follow for at home care.

Dry Eye

Dry eye is a multifactorial disease of tears and ocular surface that results in symptoms of discomfort visual disturbance and tear film instability with potential damage to the ocular surface. It is accompanied by increased osmolality of the tear film and inflammation of the ocular surface. (Foulks, G. N., et al., 2007)

Studies suggest that dry eye will affect between 17 and 30 percent of the population at some point in their lifetime. (Atkins, 2009) The inflammation associated with dry eye can be brought on simply by the chronic stress of contact lenses and autoimmune diseases such as rheumatoid arthritis. (Foulks, G. N., et al., 2007) Patients with the condition have to replace this missing fluid on a regular basis to prevent inflammation and ultimately damage to the eye. This makes the use of eye drops and the risk of a medication error an everyday ordeal.

Conjunctivitis

Conjunctivitis, commonly known as pink eye, is a condition brought on by allergies and viral or bacterial infection. ("Pink eye (conjunctivitis)," - Mayo Clinic, April 2, 2012) Allergic conjunctivitis is one's body releasing histamine in response to an environmental trigger such as pollen in the eyes.

This condition is usually treated by use of allergy eye drops. ("Pink eye (conjunctivitis) Causes," - Mayo Clinic, April 2, 2015). The condition, especially the bacterial kind, can occur within the first 28 days of birth and throughout the rest of one's life. (Normann, 2005)

The treatment of all these conditions use ocular medication such as Chloramphenical and other antibiotic eye drops and the similarity of their packaging to cyanoacrylate causes problems. Two cases in particular bring this issue to light. The first was a mother who accidently put nail adhesive into the eye of her 3 month old instead of the prescribed chloramphenicol, the second was a 3 year old who, modeling her mother's behavior of putting antibiotic drops into her brother's eye's accidently put the nail adhesive in her own eye, thinking it was the medical drops. (Needham et al., 2001)

Tools and Methods for Gathering and Analyzing Data

Analysis of existing design solutions to medication problems

Thoughtful design has successfully been applied to reduce medication errors and confusion. In 2005 the retail giant Target implemented a new prescription bottle design created by graphic designer Deborah Adler aimed at reducing errors. After finding out that her grandmother had taken her husband's medication, she set about improving the clarity of information on the bottle. With the help of industrial designer Klaus Rosburg and Target's in-house design team, ClearRx was launched and since then they have seen double-digit sales increases. ClearRx uses larger flat prescription bottles that allow for larger type for easy reading, as well as differently colored bands so that multiple users in one household can color-code their medication bottles to reduce confusion.

In 2010, ClearRx was given the Industrial Designer's Society of America's prestigious

Design of the Decade Award for "the finest example of design that was realized during the first decade of the 21st century." (Adkins, T., 2010) This example, although not specific to eyedrops, does indicate that thoughtful design can be a powerful ally in reducing medication errors and mix-ups. This creative work aims to explore package design and labeling more specifically with regards to eye drops.

Patent research

Searches for patents of eye drop bottle designs and eye drop aids return numerous results. One can find patents dating back decades and continuing to recent years dealing with aid of delivery. The number of patents and their continued filing shows there is a need for improvement of the traditional eyedropper design. The majority of these patents are for directing the drops into the eyes but few actually deal with the shape of the bottle itself and in attempting to solve one issue, created another.

Patent number 3,446,209(Figure 3) shows a pair of non-prescription glasses that attempt to help patients target drops into their eyes. This could be helpful for those with shaky hands but it takes ten steps from opening the bottle to putting the cap back on. Now repeat those ten steps for any other medication you have and then multiple that for how many times a day you need to take them.
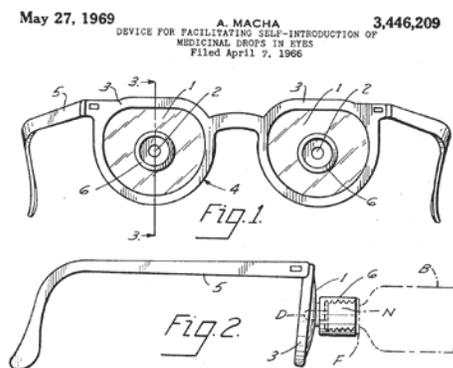
Figure 3: Patent# 3,446,209
A proposed aid for eye drop dispensing

After Market Aids

A number of these patents turn into aftermarket aids. Their prevalence also shows a need for improvement of the traditional eye dropper design. The primary focus of aftermarket eyedrops aids is targeting drops into the eyes. For example, EZ drops™ are adhesive reflective strips that have a pinhole for light to flow through. The combination of these features are meant to allow the user to properly line up the eye dropper with the center of their eye. Problems can arise when more than half the medication in the bottle is gone and the user can no longer hold the bottle horizontally. Forcing users to hold the bottle in this way limits their options for comfortable eye drop techniques. The AutoDrop™ (Figure 4) is a cup that one places eye droppers into. This product is also strictly a delivery aid, but it is a bit more complicated to use and does not fit all eye drop bottles.

Most eye drop delivery aids do touch the area surrounding the eye and are left on the bottle after use, further increasing the risk of contamination. The AutoSqueeze™ (Figure 4) is a companion to the AutoDrop™ that helps users compress the bottle for ease of drop dispersal. While some of these products are effective, simple to use, and inexpensive they only provide a single function, can decrease ease of use, and increase the concern for infection. Their existence proves there is a need for a better-designed eye dropper bottle that takes a deeper, more inclusive look at users.

Figure 4: After Market Aids AutoSqueeze™ and AutoDrop™

Anticipated Sub-Problems

Ease of Use

The design should be easy to grip and squeeze. Research will need to be done to see how to best accommodate the majority of users with limited dexterity. The design language of the item will need to inform users of how and where to best grip the bottle.

Clarity of information

All efforts must be made to make the information accessible to all users. With that in mind a system must be developed to accommodate the color blind, various types of vision impairments, and even the blind if possible. The information must be displayed in an aesthetically pleasing way to attract the user, as well as to prevent stigmatization.

Manufacturability

The current eye dropper design is relatively cheap and easy to manufacture. The new design must keep costs to a reasonable level. The design itself must keep the medication and application area sterile.

Scope and Limitations

While the aim is create a complete eye drop experience that minimizes medication errors through easy identification and ergonomics there are instances where this system might not be necessary. For example, hospitals might benefit from the system of identification, but professional staff members may dispense the medication there. They might benefit from the improved design of the bottle, but the added cost of more complex manufacturing might not be justifiable in the long term. As a result, the bottle and cap design will be aimed at home care, for example users with medically diagnosed ophthalmic problems requiring regular dispensing of eye drops (e.g. glaucoma, dry eye, cataracts, etc).

These users will greatly benefit from a redesigned bottle's ease of use and dispensing. The aesthetics of the packaging and information is important, but aesthetic choices should not compromise clarity of information. User testing will be done in two ways. The bottle and cap design will be further tested with the primary test user and by other users with varying levels of hand dexterity. The clarity of new icons will be tested using an online survey in hopes of getting a greater number of results and feedback on the design(s).

There is a limited budget for manufacturing and limited resources and abilities to prototype and test completely sterile packaging. As a result, certain tests will have to go undone. For example, users will not be testing any prototype with liquid on their eyes at any point in this creative work project so as not to run the risk of putting an unsterile liquid in the eye. An alternative method, such as squeezing eye drops into a cup or model, could be used. Any prototypes used will be for testing identification, ease of opening, squeezing and roll-away prevention.

Adoption of Universal Design Framework

Universal design, sometimes called inclusive design, is a methodology that emphasizes user-centered design to accommodate the needs of people of all ages, sizes, and abilities without the need for adaptation or specialized design solutions.[2] Universal Design methods were adopted as a framework for this design. This framework, helps to reduce the need for aftermarket aids by focusing the design decisions to be as simple and inclusive of all users as possible from the beginning.
This was especially important considering that some users of eye drops are elderly patients as well as people with impaired vision, both of which could benefit from universal and inclusive design strategies.

2 ("Committee of Ministers - on the introduction of the principles of universal design into the curricula of all occupations working on the built environment," 2001)

Research methods

Initial research consisted of phone interviews with eye drop users. After getting feedback from users about their problems, scholarly research began and has been ongoing in order to verify the design direction and identify pharmaceutical packaging requirements and best practices. In addition calls were made to poison control centers to confirm that operators were receiving calls regarding non-eye drops in the eyes.

User centered methods

User observation and testing were critical in developing a functional system that would be useable by many different people. User observation brought to light difficulties the user had, that would have otherwise gone unnoticed. Initially users spoke of difficulty with opening and using the bottles but did not mention the difficulties in identifying and opening the packaging.

In developing preliminary prototypes it was critical to get them into the hands of the user to get ergonomic feedback. This led to better designs with clear language and more comfortable shapes. A user that was interviewed had begun to develop a system to record the number of drops and applications per day on the bottle itself using a permanent marker. Taking this idea prototypes of icons were produced to place on the new bottle where users could write this information in an organized manner.

Color blindness testing

To make sure color blindness is taken into account, applications that can approximate different kinds of color blindness will be used throughout the design process. This helps to ensure that the designs will be accessible and readable by those with common variations of colorblindness.

Outcomes: Creative Work

The outcome of this creative work will be a complete packaging and product design system for eye drop delivery. There will be a new bottle and cap design that will be heavily based on Universal Design principles and user testing of iterative prototypes. The bottle will have an easy to grip and squeeze design that also prevents it from rolling away and becoming lost or contaminated. Both will address these issues while trying to keep the cost of manufacturing to a minimum. The cap will need to address the problems of roll-away and be easy to grip and twist with limited strength and dexterity. There will be a system of simple, easy to see and remember icons aimed at preventing medicine errors. These icons will include the FDA approved color- coding for medications and be embossed to add another layer of information. Giving multiple levels of the same information will not just decrease the likelihood of medicine errors it will also take into consideration the blind and color blind, who would not be addressed if just the color coding was used without a tactile indicator. The icons are not just for patient's readability but are also aimed at eliminating medicine errors from the point of prescription all the way to at-home patient delivery.

Packaging Prototypes

Icon creation

Research showed that medication errors can occur at many stages of the delivery process, from incorrectly read handwriting on a doctor's prescription pad all the way to patients not being able to recognize the proper medication. A system is needed that is easy to identify and follow. To design labeling that is easy to identify by all you must first be able to understand how they see. There are many eyesight simulators online designed by different eye institutes. I have included pictures from the National Eye Institute in Table 3 showing simulations of different types of vision impairment.

In looking at these simulations you find a few similarities between them including general blurring which makes it hard to read text at all let alone the tiny type on eyedropper bottles.

So a familiar, easy to identify shape can be used to substitute a logo with type. (Figure 5)

Figure 5: First Generation Icons

There is also some color loss so the icons should be black to contrast the white of the packaging. There is also spotty vision loss so any identifier shouldn't have small parts that if obscured would make it unidentifiable.

These second generation icons (Figure 6) are an improvement. They are bolder and easier to identify. The hope with repeating the shapes was if a person with spotty vision loss couldn't see the whole icon they could see one of the smaller icons it was built of.

Unfortunately they would be fairly small on a bottle in addition to being reminiscent of a crash test dummy, the Tri-Force icon from the video game Zelda, and the Target logo.

Figure 6: Second generation icons

If a patient has spots of vision loss parts of the icon could be obscured so the icon should be as bold, clean, and easy to see as possible. For these reasons, a heavy line weight shape with a hollow center was chosen (see Figure 7).
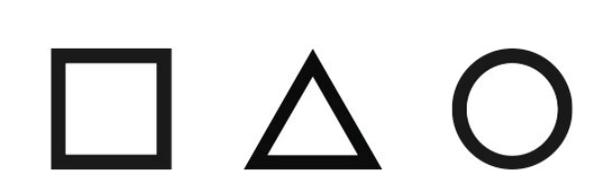
Figure 7: Third generation icons

Secondary Icon Creation

Users had difficulty remembering how many drops per application and how many times a day they had to take their medication.
In some cases this can cause dangerous pressure changes in the eye. To address this issue a set of icons was developed to be placed on the bottle itself (see Figure 8).
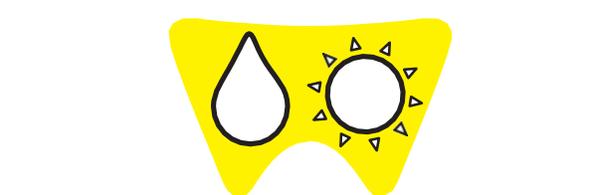
Figure 8: Secondary icons for back of bottle

FDA Color Coding

The FDA has put forth a system of color coding different medications in hopes of reducing medication errors. Different colors have been assigned to anti-infective, anti-inflammatories/steroids, mydriasis and cycloplegics, nonsteroidal anti- inflammatory, meiotic, and beta-blockers. Use of incorrect medication can cause unwanted side effects such as pressure change, blurry vision, and prolonged infection.

The color-coding is a good step toward reducing medication errors. However a number of eye conditions affect color acuity. For these users the color-coding becomes less helpful and for the colorblind can be of no help at all. Deuteranope, the most common type of color blindness affects 5% of males and protanopia affects 2.5% of males, a significant portion of the population.

With Deuteranope the colors tan and magenta and violet and indigo are hard to distinguish. Protanopia makes it even harder to recognize the difference between any of the commercial drops. The font size of the text on the label makes It hard to identify one from each other but the icons on the prototypes are still easily visible.

Perceptible Information & Aesthetics

When talking about the packaging of the product a mention must be made about aesthetics. The hierarchy and clarity of information is paramount but that does not mean aesthetics shouldn't be taken into consideration. A number of users must take drops for long periods of time including those with glaucoma who have to take them for life or risk blindness. Some of these users have to start taking them at a very young age and there must be a strong effort made to not stigmatize users by creating an unattractive package.

The icons are displayed prominently on the front, side and top (see Figure 9). The top being an important distinction as prescription labels will wrap around the sides of the box covering the sides of the medication. The icon on top will allow users to easily identify the medication even when it is packed side by side to other medications in a cupboard. The appropriate FDA color coding is used on the upper portion of the packaging as an identifier and an aesthetic choice.
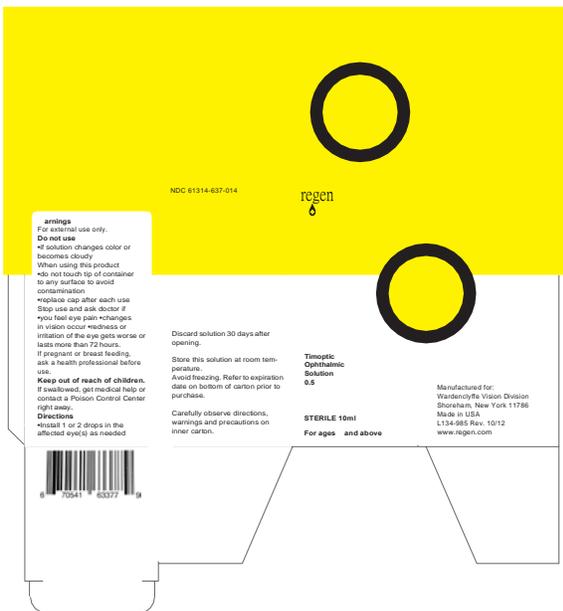
Figure 9: Packaging

Physical Prototypes

Foam Prototypes

The poor ergonomics of the eye dropper cap and bottle made delivery of the medication difficult. In order to test different shapes, foam prototypes were made on a lathe and then carved with a rotary carving tool.

Three distinct shapes were made to test different features. A more traditional eye dropper bottle was made with divots on the sides in hopes of improved gripping ability. A larger bottle was made without the divots but with a larger cap with a flat surface that could be gripped in a more closed fist fashion. In user observation the necessity of pliers to open a bottle showed the difficulty that users with arthritis and other hand weaknesses had using the pincer grasp. The new cap shape was developed to eliminate the need for this method of gripping. A third shape was created that abandoned the traditional bottle shape and included both the divots and larger cap (see Figure 10).

Figure 10: Foam Prototypes

User testing

The importance of user testing cannot be understated. As someone who does not have arthritis, any neuropathy diabetic or otherwise, it would be foolish to design a product without having potential users try it out first. In keeping with the Universal Design focus the prototypes were tested by users that varied in age, sex and ability level. During user testing the prototype with the divots and larger, easier to grip cap was unanimously chosen as the preferred combination. Users cited the side grips and large flat cap as the reasons.

Qualitative Feedback

Feedback sessions with a varied audience is important. While targeting an audience, especially an audience with specific limitations can be helpful, if you take the extremes into account those within the norm will also be accommodated. For instance, Chris is 61 years old and has no arthritis. He found prototype A to have a good grip to it. However users Paul, Nikki, and Katherine found the same design difficult to use because of its small size. This is because those users suffer from arthritis. Chris did find the caps for prototypes B and C more comfortable than A, but since he does not have arthritis he would not go looking for something other than your traditional eye dropper bottle.

User Jeffrey also brought up the concern that prototype B is not esthetically pleasing. This shows how important, even at such a basic form, appearance affects a person's choices. Taking into consideration the variance of different users, the goal should be to create an attractive product that incorporates ease of use without substantially increasing cost.

Cad Development

Using the feedback from the user testing sessions the CAD programs Rhino and SolidWorks were used to develop 3D models of a new bottle and cap. As shown in Figure 11, the divots and large flat cap that users identified as positive features were incorporated. In addition a split in the bottle was added to decrease the amount of strength required to dispense medication. In addition to making the bottle easier to use the unique shape makes it very difficult for any users to mistake it for superglue or any other medication.
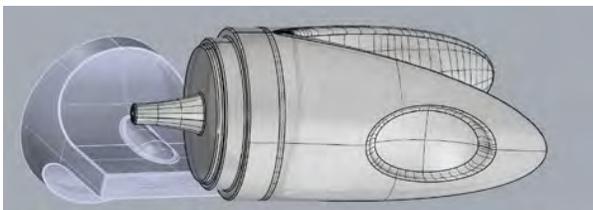
Figure 11: Cad model of new cap and bottle

3D printing

The availability of 3D printing has expedited the prototyping process. More filament types are coming out with different properties that help us quickly test out ideas. For this stage of prototyping a rubber filament was used that allowed users to test the action of the split design (see Figure 12).

Figure 12: Flexible 3D printed prototype

After the split design was confirmed as a positive feature the 3D models were printed in Acrylonitrile Butadiene Styrene (ABS) plastic. The models were then smoothed using acetone, sanded, filled, primed, painted, and coated with a clear gloss. Finally, paper labels were applied (see Figure 13).

Figure 13: Finished 3D printed models

Manufacturing

Cost is a big issue when developing a product. Particular attention was paid to how this product could be manufactured. Currently eye dropper bottles are produced using injection blow molding. Blow molding is a process that allows for very low unit price, exceptionally fast rates of production, and for threads to be molded in. (Lefteri, 2012 p.127-132)

High-density polyethylene (HDPE) is commonly used for this process, food safe, and one of the most widely recycled plastics. That combined with the very fast cycle times of production create a relatively eco-friendly process (as opposed to the use of a non-recyclable plastic). The cap will be produced using the injection molding. After initial high tooling costs Injection-molding provides a very low unit price. (Lefteri, 2012 p. 198)

Branding

There was a strong need to show the potential of this product for consumers; for this reason, proper branding and packaging were essential. Although the logo is not as important an identifier as the icon system, care was still taken to choose a font and logo that would be minimal yet still attractive. The name Regen was chosen, among many other words that referenced eyesight or health for the brand. Regen means "rain" in Low German and Dutch, a subtle reference to eye drops; and the word "regen" when read by English speaking user's sounds similar to regeneration and rejuvenation. Both of these words have a positive connotation specifically tied to health and healing. Next, a font called Airplane Regular was chosen for its clean lines and truncated letters, which keeps the letters from overlapping and therefore keeps the type more legible

Analysis

A large number of problems were identified with current eye droppers and their packaging. Successful and practical solutions were devised for most of them. I am proud to have created a prototype that has strong potential to actually positively impact people's lives.

The project could have benefited from more direct interaction with a professional who works in the medical product category. They could have given valuable information about industry regulations and other hurdles on the way to market. Most importantly this project has opened my eyes to the charge placed on designers to keep all users in mind whenever possible. This project started with an inquiry into packaging design. After numerous phone interviews it became clear very quickly that many people, especially as they age, have problems with everyday items that younger and/or more dexterous individuals take for granted. While working on this project a whole new world of everyday trials was opened to me.

Appendix A: Glossary of Terms

- pincer grasp – the grasping an object between the thumb and forefinger

- neuropathy – nerve damage

- Diabetic neuropathy - a nerve disorder caused by diabetes. Symptoms of neuropathy include numbness and sometimes pain in the hands, feet, or legs.

Appendix B: Works Cited

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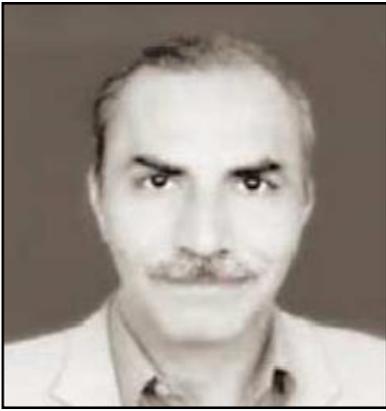
Letter from the Chairman's Desk

By Sunil Bhatia PhD

One day I was waiting at platform for metro train and there was announcement for the commuters for avoiding any inconvenience caused by number of coaches that arriving train has certain number of coaches. Immediately my imagination surfaced, in case approaching train has single long coach equal to the size of the number of coaches in place of many coaches coupled with couplings ' what will be the problem'. I realized the associated difficulties of long single coach is enormous and best suited is modular design that gives the freedom for easy maneuvering for left and right movements and for forward and backward movement engine can manage. At rush hours number of coaches is more to require transport more passengers compared to lean hours where number of coaches are reduced and helps in optimizing commercial gains. 'Is modular design modern concept?' As I brood, I found it is ancient practice and it was the biggest tool for their survival and byproduct of it helped in making lives safe for longevity. They realized living in isolation would not allow achieving longevity and life was highly vulnerable but living in a group helped in many senses and it was practical well thought modular design. That was best suited arrangements and modern people still followed the same legacy on what they were doing by using modular design but there is little modification and it is nothing but combination of standardization with economy factors for optimizing profits in terms of monetary as well completion of the time.

Primitive people were unaware about commercial gains but concerned for making their tasks easy and it should optimize their outputs and that forced for designing of tools. Iron Age gave us best tools and continuous hammering is for achieving desired result where single strike could not performed what they wished and striking many times by hammer is modular design. Chiseling, drilling is also modular design. Prior to Iron Age, design of regular stone pelting by group of people for killing the animal was modular design where number of stones of more a less has same size gave desired outcome . Where individual pelting of stone might invite trouble and might face death threats from wild animals. Similarly number of arrows when struck the chasing animal it cuts and killed because of oozing of blood from number of cuts that was nothing but modular design where single arrow could not do what strike of arrows could have performed for quick result. Before the design of tools they used to run after the animals for food in groups and killed it by simply shear physical strength was modular design where individual strength was not sufficient to kill the animal. When they cut the animal meat into many pieces was modular design and modern people also use the same when cut the vegetables into many more a less regular size for faster even cooking. It has given us choppers, knives, cutters and many more tools. Ancient people designed abode with the mud and placed it in layers by layers and allowed to dry for strength for achieving vertical height was nothing but modular design. Before this they might have used various bushes to protect from vagaries of weather. That numbers of bushes were use as per requirement was concept of modular design.

Nature has inbuilt mechanism of modular design for proper functioning. An Evolutionary believes that human being evolved from single cell or life presence was with single cell in the form of ameba on earth planet gradually number of cells came together to form living beings was modular design. Many RNA-binding proteins have modular structures

and are composed of multiple repeats of just a few basic domains that are arranged in various ways to satisfy their diverse functional requirements. They also believe how multiple modules cooperate with enzymatic domains to regulate the catalytic activity of enzymes that act on RNA and have came to the hypothesis that many RNA-binding proteins, multiple modules define the fundamental structural unit that is responsible for biological function. Next level of evolution of man did great thing by separating the thumb from the rest of the fingers helped the person to use this modular design for various applications and that has revolutionized the human progress. A set of teeth is arranged in modular design and every tooth has unique function and primitive people used for optimum applications for foods and other purpose. Even evolution of design of language that is highly structured has no visible base but it is definitely begun with modular design. I have witnessed in crèche or kindergarten there are learning tools for toddlers where number of various size of wooden blocks of definite shapes are required to fill with where number of different slots on other planks are empty is nothing but modular design.

Beehives designed in hexagonal cells for living as well for storage of honey for meeting future requirement of foods and for larvae to turn mature bee. The way worker bees construct the standard structure of hexagonal and join with bee wax is modular construction. When birds collect the straws for designing their nest is nothing but modular design by placing various leaves & straws as need is required. Some species of the bird uses pebbles for designing nest close to water body and to prevent water entry into their nest placed pebbles in such a fashion it blocks water. Climber plants have tendrils that are in the shape of spring and coiled around the nearby item for gaining support for vertical height is modular design. Spider weaves the web for trapping the insects for food is designed with modular design.

Discovery of fire strengthen the concept of modular design and primitive people realized by observation that by placing number of tinder or logs produced more light as well as heat compared to single. It was modular design that helped in regulating intensity of fire for light and heat. Iron Age was possible because of fire and new concept of joining came to the existence where they melt and cast as they wished and they felt need of cutting tools were required for desired results for proper shape and that gave us various cutting tools . Single nail for joining was not modular but as they thought to use many nails for strength and durability of joining was modular. Needle with thread for repetitive stitching was through and through modular design. Design of single stitch for joining is not modular but multiple stitches are modular design and placing standard patterns of stitches led to embroidery. Twin blade razor for shaving was modular but using single blade for shaving was not. Design of bricks using fire kiln for baking mud designed in the rectangular provide more strength compared to mud and placing one over the other for attaining the height of the house was modular design. Design of pyramid was possible by placing limestone one by one over one another was based on modular design. As people learnt the art of agriculture and wished to eliminate the chances of failing of food by hunting they did not know of modular design but tools were designed on this concept like shovel, plough etc and they used continuously hit the ground for desired outcomes was modular design.

Design of chain for proper power transformation in bicycle where joining each metallic link is an example of modular design and we never think that design of spokes in wheel is marvelous use of modular design. It was an extension of physical knot. When one knot was not good enough to hold the items they conceived the idea of tying with two or more knots was modular design. When one hook or peg use for hanging the item is not modular but design of many hooks for hanging curtain or number of pegs are arranged for hanging is definitely modular design. Some people are experimenting with the modules that serve as containers and incubators for the young mangrove saplings that, getting stronger with time, will become self-supporting and form a natural dam to meet the challenges of tsunami or high tides of the sea .To absorb the unexpected and sudden pressure that may damage the product we use spring mechanism and design of spring is modular design where number of circles are shaped one over another in by bending continuously for spiral shape and extension of it is shock absorbers.

Transforming and growing according to the needs of the user is a basic characteristic of modular architecture and design. It's almost like a collaborative process, with the designer creating a system and the users implementing it to suit their needs. When I look at the electric board in home where number of standard sockets and switches are fixed is modular design. It is not modern practice .Ancient people were governed with wisdom and realized that twisting the cotton fiber has better strength compared to natural cotton. This process gave us the threads and modern people designed various applications with this concept. Fabric is the result from weaving threads gave us dress materials and bandage for covering the wound for treatment. Metallic ropes are used for load bearing for heavy structure and even for lifting the heavy weights. Manmade knowledge of geometry contributed a lot for modular design where rectangles can be design with cubes and parallelogram by rectangle and many more standard designs can be use with standard design for transforming into other structure. Similar to wooden building blocks, the individual units are simple: a square, a rectangle, a tube or a table or chair. In combination the modules become increasingly complex and customizable, changing to fit the situation. Gear box in automobile where standard teeth pulleys are arranged is modular design.

Design of knots was simple but revolutionary and one knot was not sufficient to hold the items because the basic concept of knot is based on friction and holding item has more weight and single knot failed then they devised multiple knots were used was modular design for increasing frictional force. Single button with hole is not modular but multiple buttons used in dress is modular design. Design of zip is absolute modular design. When clay pot makers use spinning wheel for shaping the pots is helping in making of various pots of same size is modular design. Iron smith uses leather bag for blowing air for more fire heat and his continuous efforts for getting right heat for melting by blowing is definitely modular design . In agriculture use of continuous shovel or plough for digging the hard surface where single strike is insufficient but many strikes gives the desired outcome is design of modular. In modern time camera can take single shot but rolling of camera can take many shots and result is motion picture and it was possible because of modular design. Single step of staircase is idea to climb but using many steps to reach destination is modular design. Using finger for correcting dishevels hairs was not giving best result and they extended for designing of comb that is nothing but modular design where number of teethes are arranged. They further extended to design of broom by bundling standard size of straws. Painting brushes are modular design where number of standard hairs are tied is modular where single hair cannot perform for desired outcomes. Number of medicines tablets are fixed in standard format in strip is modular design. Numbers of beads are weaved for design of necklace is modular. Woman makes the long braids when she interlaces three or more strands is absolute modular.

We are honored that Prof Ricardo Gomes of San Francisco state University accepted our invitation of Guest Editor and agreed to showcase his as well as team works in this special issue. Prof Gomes is distinguished designers and his contribution for academic area as well in universal design is undoubtedly unmatched and unparallel. It is best gift for our esteem readers for improving and opening their faculty of mind by reading this special issue and can use this latest knowledge in their works.

With regards

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Forthcoming Issues

October 2016 Vol-11 No-10

David Berman Accessible design thinker, expert speaker, author (Do Good Design), UN advisor on IT accessibility, GDC ethics chair. Communications strongly believes that we can design a better world that leaves no one behind. We've been leaders in the online accessibility field for over 15 years, and we're eager to help you gain from the benefits of inclusive design. David is a senior strategic consultant to the Canadian government, as well as other governments on four continents

November 2016 Vol-11 No-11

Prof NirajaTikku and Associate Prof Krity Geara of Industrial Design of School of Planning and Architecture Delhi will be the Guest Editor

December 2016 Vol-11 No12

Mainak Ghosh Assistant Professor Department of Architecture & Regional Planning, Indian Institute of Technology Kharagpur , India will be the Guest Editor . his research interest revolves around perception studies, cognition and learning, and urban design. Presently he is working on various facets of visual perception factors cutting across various media in an urban domain. Precisely this delves in understanding concepts between spatial design, Human Computer Interface, Robotics, Information and instructional design, interaction design etc. which could be proliferated at an urban design and urbanscape level. Completing his Bachelor in Architecture, he deep-dived into specialization of visual communication design in IIT Kanpur, Masters in Design. There after industrial experience as design consultant in one of the largest corporations in India. He has worked for various international and national clients working on the fronts of innovation, research & development and design interventions. He is well travelled with collaborations and connections in USA, Canada, UK, China and UAE. He is the founder of Undream Design, a holistic design hub. He has always been keen on academic pursuits, with publications of books, various journal papers and with attending conferences, mainly focusing on bridging the gap between communication design and space, architecture & urban forms. He has been invited speaker to Smart Cities and Countries Congress held in Paris last year. He has been visiting faculty in various institutions such as, Jadavpur University, School of Illumination Science, Engineering and Design, Kanpur University, Loreto College. Apart from his academic and professional expertise, as a hobby he is inclined towards artistic spurts. His art works has been exhibited in Berlin, Germany in 2012.

January 2017 Vol-12 No-1

Gerhard M. Buurman is the founder of a couple of programmes, initiatives and institutes at the Zurich University of the Arts (ZHdK). Hochparterre called him a steady initiator and Bernhard Bürdek commended his distinguished ideas on the university level. As theorist and vibrant researcher he worked in international groups at the ETH Zürich and Harvard Law School as a practitioner. He will be the Guest Editor.

Jim Harrison is a Lecturer at the Cork Centre for Architectural Education in Ireland, and has long experience of teaching, research and publication on aspects of Universal Design and user-friendly design for ageing as well as in integrating these topics into the architectural curriculum. He also has been a supervisor to PhD and Masters thesis candidates in related topics.

He has produced numerous publications on inclusive design related topics with over 50 papers and journal articles, a collection of which were successfully presented for his Higher Doctorate (LittD) at the University of Sheffield. Whilst teaching in Singapore (1984 – 2002) he became involved in UN ESCAP 'Training the trainers' accessibility workshops in the Asian Pacific Region, in which he is still active. Amongst many other achievements he contributed a section for the Singapore Access Code on the needs of older people and, as a UN Expert Resource Person, continues to participate in projects on Universal Design promotion. He will be the Guest Editor.
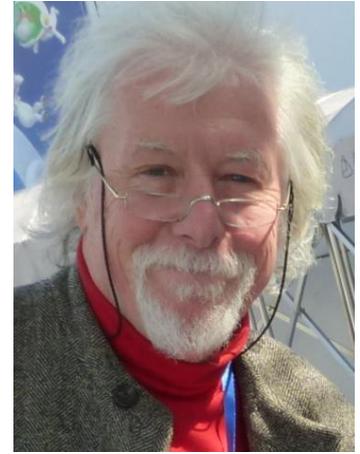
Bonollo, Emeritus Prof. Elivio Emeritus Professor, Industrial Design Faculty of Arts & Design ,is one of Australia's leading industrial design educators and researchers. In 2008 he was conferred with the Honour of Cavaliere by the President of the Republic of Italy in recognition of his collaborative work in design and education. He is emeritus professor of industrial design at the University of Canberra (UC), and recently visiting professor in the School of Design and Environment (2004 -2007), and the Department of Mechanical Engineering (2007) at the National University of Singapore (NUS) will be the Guest Editor

Dr. Sandeep Sankat (PhD, M. Ekistics, B.Arch.) Associate Professor,Department of Architecture , School of Planning & Arctitecure, Bhopal India will be the Guest Editor .

June 2017 Vol-12 No-6

Dr. Gaurav Raheja Associate Professor, Department of Architecture & Planning Joint Faculty, Centre for Excellence in Transportation Systems Indian Institute Of Technology (IIT) Roorkee, Uttarakhand State, India will be the Guest Editor

July 2017 Vol-12 No-7

Mark Watson was chosen from an international field of Designers to participate in the International Society of Councils of Industrial Design Interdesign Workshop, a two week workshop looking at Smart City solutions to social, environmental and economic problems in Mumbai .

Mark has a 15 year long engagement with Design in India presenting at leading Design Conferences on Design Thinking and Experience Design and is currently adviser to the Indian Design Festival.

Mark Watson MDIA Managing Director Design Providence http://www.designprovidence.com.au Lead Partner Design Thinkers Group Australia http://www.designthinkersgroup.com/

Co-Founder Indo Australian Design Research Alliance https://www.

New Books

Universal Design Tips: Lessons Learned from Two UD Homes:
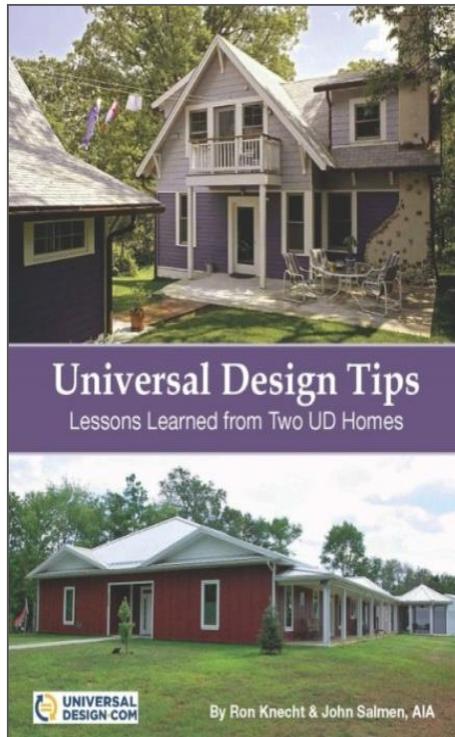
This new electronic book from UniversalDesign.com is filled with tips and ideas that will help guide anyone through the process of designing and constructing their own Universally Designed home. The book was co-authored by John Salmen, AIA, the publisher of *Universal Design News* and founder of UniversalDesign.com, 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.

China Design Index 2014:
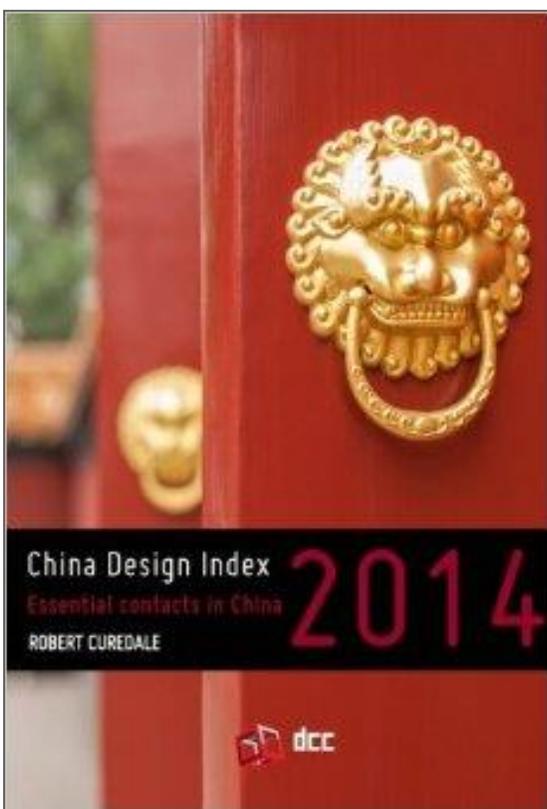
China Design Index 2014: The essential directory of contacts for designers Paperback – February 1, 2014 by Robert A. Curedale (Author)

The Road Ahead, Transition to Adult Life for Persons with Disabilities:
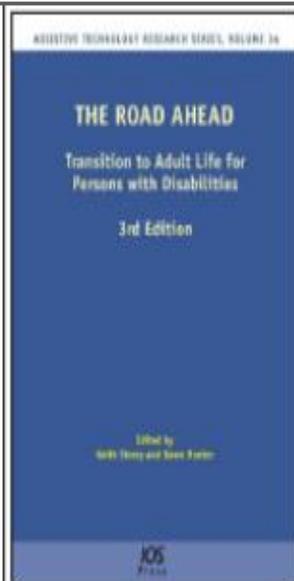
The Road Ahead

Transition to Adult Life for Persons with Disabilities

Volume 34 Assistive Technology Research Series
Editors: Storey, K., Hunter, D.
December 2013, 318 pp., hardcover (revised 3rd edition)
ISBN 978-1-61499-312-4 (print)
ISBN 978-1-61499-313-1 (online)
Price: €69 / US$100 / £59

Successful transition from school to adult life has always been difficult for people with disabilities, especially in the area of employment. The vast majority of people with disabilities are either unemployed or underemployed with low wages and few benefits, and many governments are struggling to find a way of providing employment and benefits to people with disabilities without creating disincentives to work.

This book provides strategies and ideas for improving the lives of people with disabilities, exploring new ways of enabling a successful transition to an integrated adult working life by providing effective instruction and support. Following an introduction which outlines the importance of transition services and meaningful outcomes, topics covered in the remaining chapters include: person centered transition planning; enhancing competence and independence; employment assessment and career development; collaboration between agencies for a seamless transition; independent living and supported living; and community functioning skills.

The book will be of interest to all those who work with transition age students as well as those who work with adults with disabilities and want to enable them to have the best life possible. To paraphrase Helen Keller: "People with disabilities not only need to be given lives, they need to be given lives worth living."

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Design for All, Aree DiRistoro:
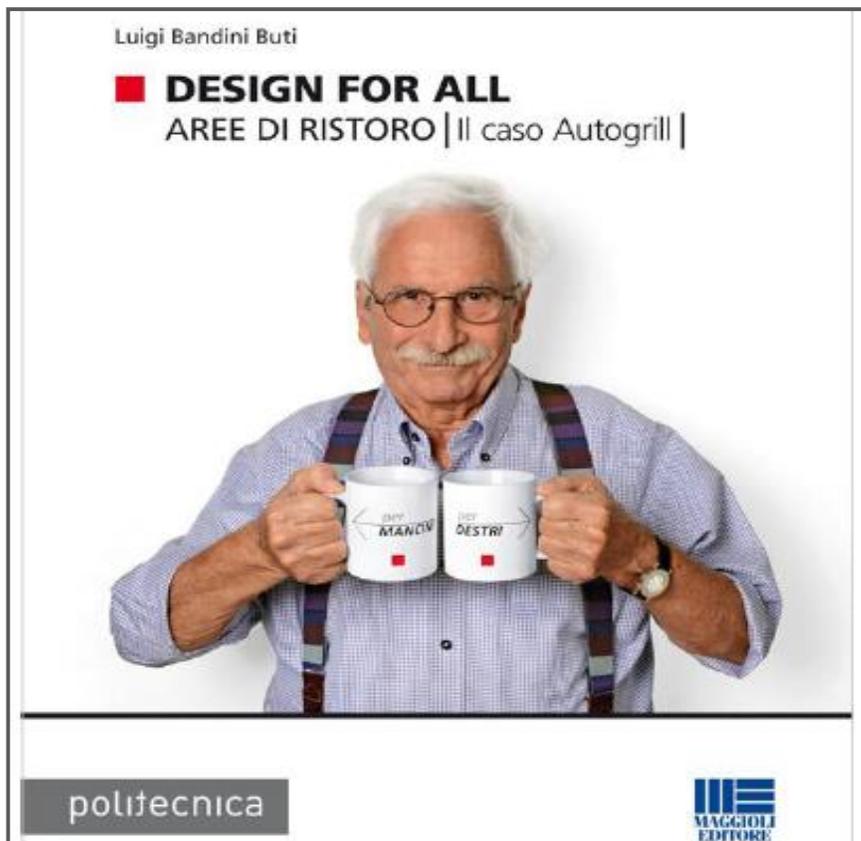
Luigi Bandini Buti
DESIGN FOR ALL | AREE DI RISTORO | il caso Autogrill |
Maggioli Editore, 2013
http://shop.wki.it/risultatoricerca.aspx?indizioricerca=luigi+bandini+buti

This book has been born following the collaboration with Autogrill that, for its new facilities "Villoresi Est", has developed an innovative, Design for All oriented project. We then realized that the cares foreseen for "all" would not be noted by "the majority".
If you are not on a wheel-chair, or blind, or you are not travelling with a large family or you don't have to look after your old grand-father, you will not be able to appreciate many of the attentions included into the project. It was therefore necessary to make more visible the virtuosity of the planning process and its results, which may not appear obvious to many people.

This publication is not meant to be a mere description, it is rather a critical analysis of the Villoresi Est rest area, included in a context that wants to examine in depth the methods and the means of Design for All.
Its main objective is therefore to use the "Autogrill case" to investigate the necessary steps to develop projects Design for all oriented, hopefully in an authoritative way.

Accessible Architecture, A Visit from Pops:
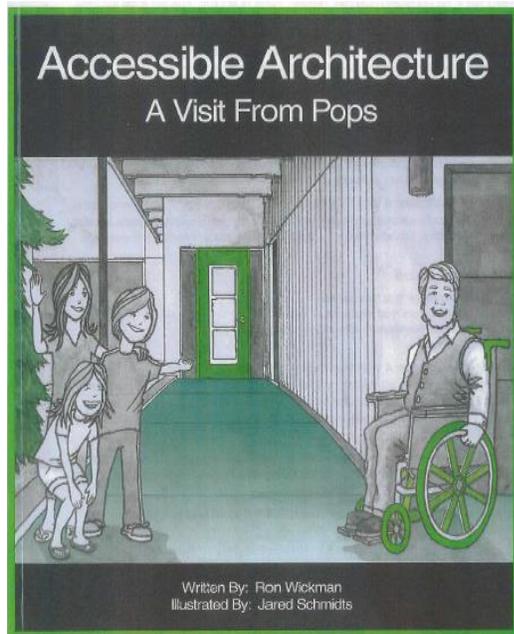
Edmonton Architect publishes - Adult Children's Book—Accessible Architecture: A Visit From Pops.

Edmonton Architect Ron Wickman launches his first book titled: *Accessible Architecture: A Visit From Pops* at the City Room in City Hall, Tuesday, March 18 at 6 p.m. Ron, son of the late Percy Wickman, MLA Edmonton-Rutherford 1989-2001, is a story written on the focus of Percy and his 3 grandchildren. Ron is best known for his accessible design. His most recent endeavor published by Gemma B. Publishing draws on this knowledge. Edmonton draughtsman Jared Schmidts illustrates with wit and precision the need for a house to be visitable by everyone.

As a child, Ron Wickman learned firsthand about the need for accessibility. His father became paraplegic after being injured by an industrial accident. Ron wheeled his father into many inaccessible places. A longtime Edmonton City Councilor Percy Wickman advocated for people with disabilities throughout his life.

Ron Wickman studied architecture in Edmonton and in Halifax, Nova Scotia, specializing in barrier-free design, designing houses and public spaces that were both beautiful and accessible.

Accessible Architecture: A Visit From Pops—is an adult children's book, which demonstrates the three principles for ensuring a house can be visited and enjoyed by everyone equally, including those with a disability. Following Wickman's design and renovation also enables homeowners to age in place.

Visitability principles include

- the front entrance must have no steps;
- all main floor doors must be at least 36" wide
- an accessible washroom must be on the entrance floor.

Accessible Architecture: A Visit From Pops, by Ron Wickman, illustrated by Jared Schmidts and edited by Sarah Yates, is published by Gemma B. Publishing, a Winnipeg-based publisher. Gemma B. Publishing creates heroes and heroines living with a disability, in both fiction and non-fiction. The book will be launched at Edmonton City Hall, March 18 at 6 p.m. and available later at Audrey's Books in Edmonton.

Ron Wickman will be available for interviews after the press conference at City Hall. His lecture at the Buildex Conference, Edmonton Expo Centre, Northlands will be held Wednesday, March 19 at 2:30 p.m.

Accessible Architecture: A Visit From Pops ISBN978-0-991697-0-8 sells for $20.

– 30 –

For additional information, contact:
Ron Wickman
Architect
780-430-9935
E-mail: rwickman@shaw.ca

The Politics of Disability by Peter Gibilisco:
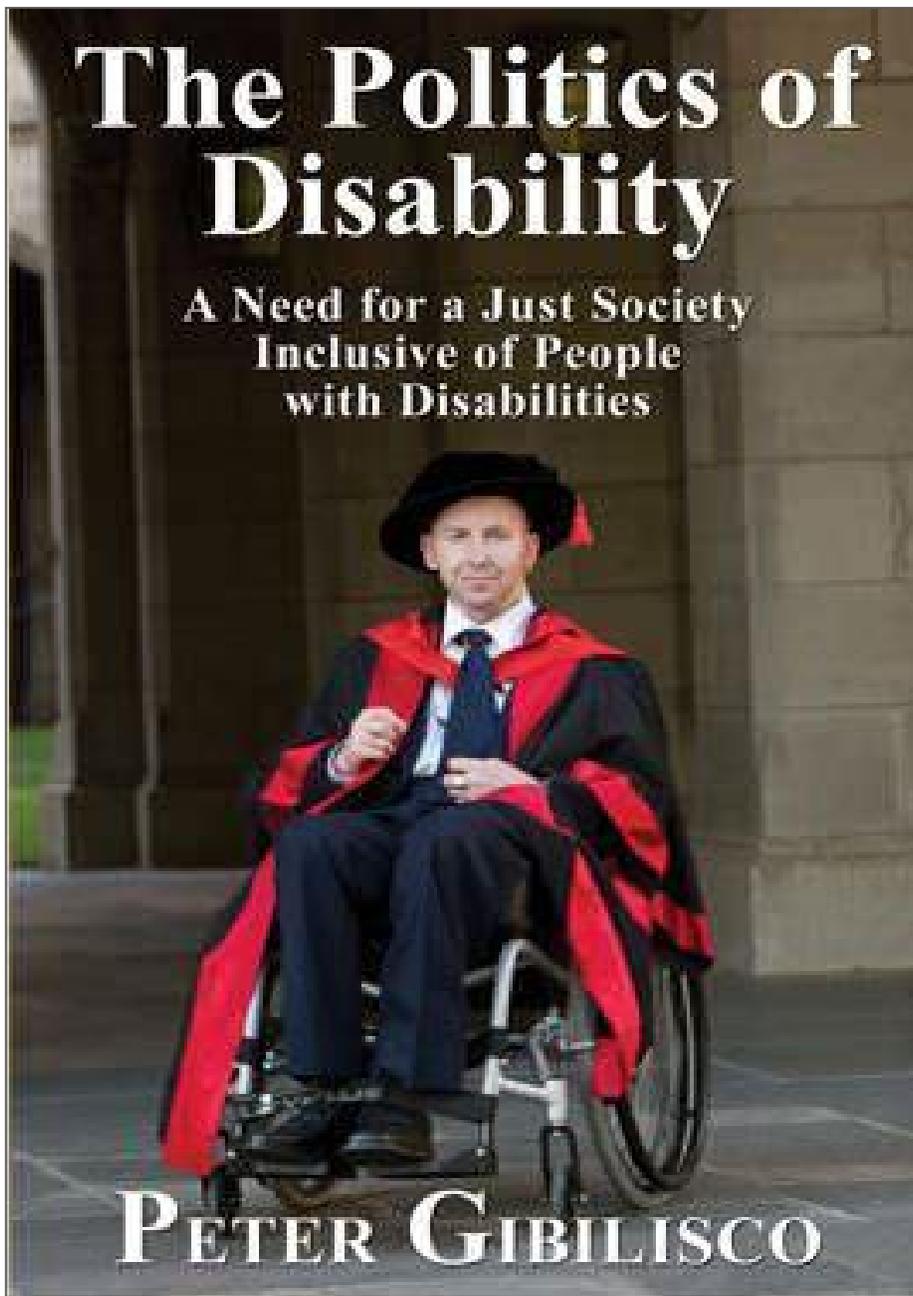
This book will retail for a recommended price of $19.95 USD ISBN 978-1-77143-155-2, with an ebook version also available at a recommended price of $7.95 USD ISBN 978-1-77143-156-9. You'll be able to buy it from all the usual places - Angus & Robertson, Bookworld, Fishpond, Amazon, Kobo, iBookStore, and Google's Play Store, amongst others.

Cultural Revolution by Maurice Barnwell (Author):
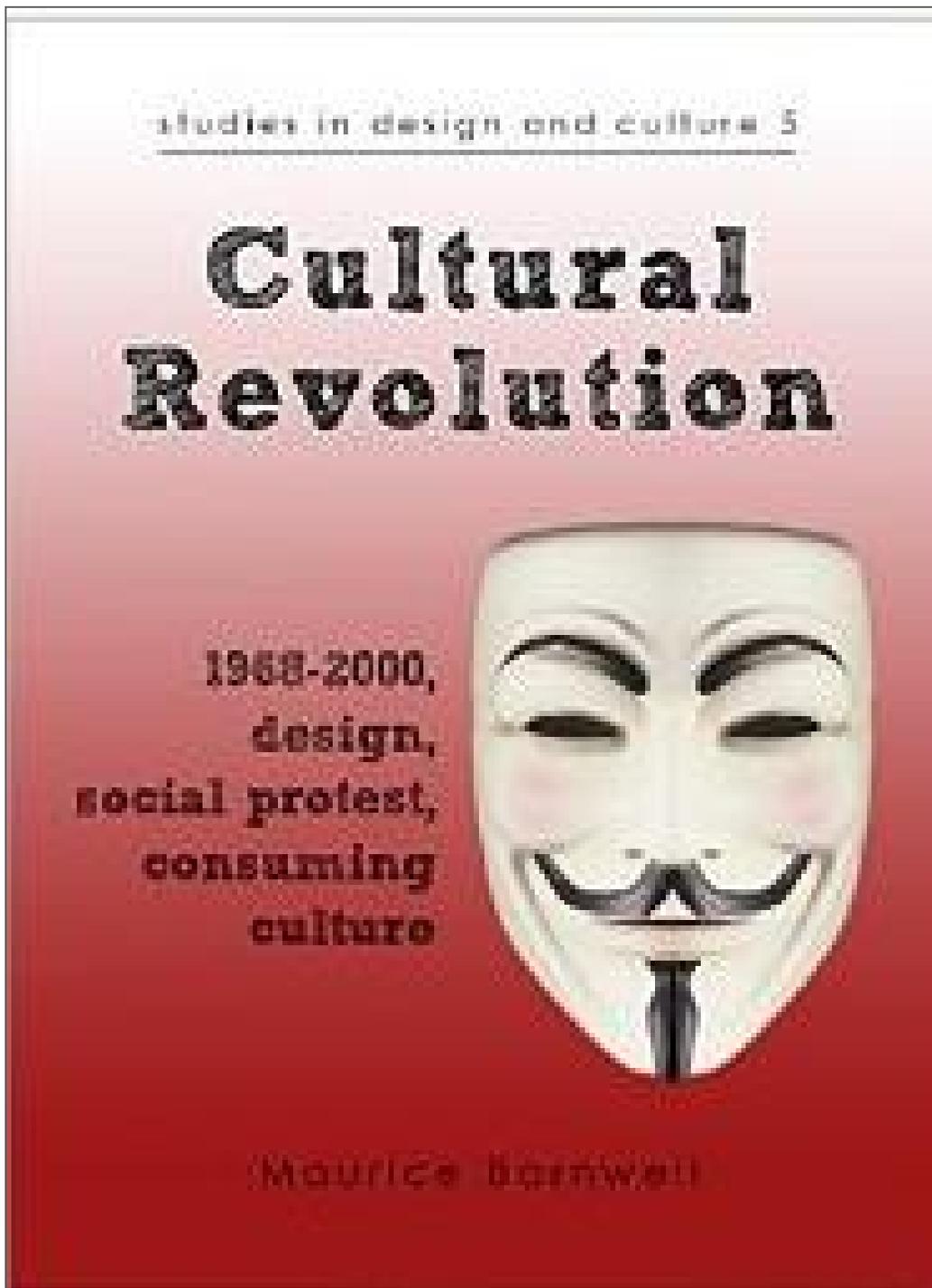
Methods, tools, applications. Volume 1–2 (Steffan, 2012):

Design for All — the project for everyone. Methods, tools, applications.
Volume 1- 2 (Steffan, 2012)

The publication highlights the multidisciplinarity and cross-disciplinarity of the Design for All approach, both in terms of issues addressed and of field of application. The accessibility of places and objects is nowadays a minimum requirement: it is only the starting point to allow their use by the widest range of people possible. Through professional experience and research, the paper tackles problems, methodologies and working tools, benchmarks.

The first volume covers the main areas of research and presents some examples at urban scale; the second volume illustrates examples of architectural design, products, services, university education.

The lack of compliance of the built environment and of the products, with needs that can be very different, causes a state of handicap. The lack of ability is a handicap only if the project has not taken it into account.

With these books we intend to stimulate debate, in-depth research, specialized studies, so that Design for All can be increasingly known and applied in more and more research and professional areas.
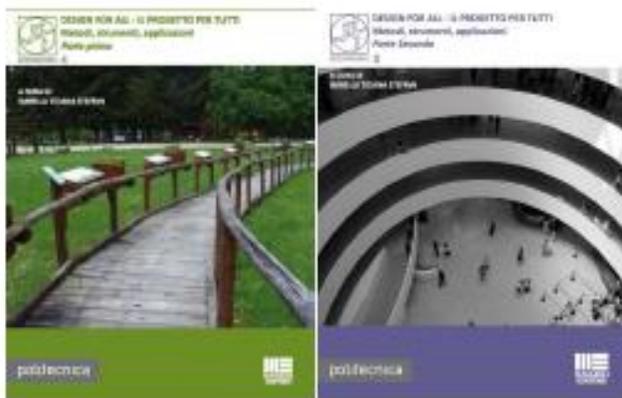
Published in Italian in December 2012 by Maggioli Editore (Santarcangelo di Romagna RN, Italy).
http://ordini.maggioli.it/clienti/product_info.php?products_id=8832 Volume 1
http://ordini.maggioli.it/clienti/product_info.php?products_id=8831 Volume 2
The on-line English version is also available since October 2014:
http://www.maggiolieditore.it/ebook/tecnica/design-for-all-the-project-for-everyone-first-part.html
http://www.maggiolieditore.it/ebook/tecnica/design-for-all-the-project-for-everyone-second-part.html

"Ideas, even good ideas, flourish only when practitioners commit to sharing their experiences, perspectives and aspirations. By organizing this publication and convening a distinguished international group of contributors, Editor Isabella Tiziana Steffan helps to establish the current state-of-the-art and affirms the significant potential of Design-for-All. She also delivers fresh inspiration to an expanded audience critically important to engage if Design-for-All/Universal Design is to realize its promise in the coming years.(…)We salute Editor Steffan for her passion, focus and hard work to bring this valuable contribution to fruition." (Valerie Fletcher)

Universal Design in Higher Education:

Disability, Rights Monitoring and Social Change:

DISABILITY, RIGHTS MONITORING, AND SOCIAL CHANGE
Building Power out of Evidence

Edited by
Marcia H. Rioux,
Paula C. Pinto,
and Gillian Parekh

Amazon.co.uk

Amazon.com

Product Description

In this book, Elivio Bonollo takes us on a 'learning journey' about design including a scholarly explanation of the characteristics and power of the design process. It provides valuable insights into the attitudes, knowledge and skills that underpin the design discipline at an introductory level of expertise, and has been developed to meet the needs of aspiring designers in many areas including industrial design, design and technology, art and design and architecture. Elivio uses an operational model of the design process - along with related educational strategies, learning outcomes and an ordered set of design briefs - to develop a systematic, problem-based method for learning design from a first principles viewpoint. The beauty of this approach is that it brings structured learning to aspiring designers whilst being mindful of diverse cultures and backgrounds. Each part of this book encourages self-expression, self-confidence and exploration: it is has been carefully designed to take the reader on a highly motivating journey of design thinking and creativity, supported by excellent sample solutions to design problems, lucid discussions and extensive references. These solutions, developed by design students, serve as novel examples of how to solve real problems through innovative design without restraining creative freedom and individual personality. The design learning method and strategies in this book will greatly assist design and technology teachers, students of design, aspiring designers and any individual with an interest in professional design practice.

I cannot recommend this book highly enough, it was a complete lifesaver throughout my undergraduate studies and honours degree and now continues to serve me well as I move into industry practice. The content is easy to understand and follow, providing a practical guide to understanding design principles and every aspect of the design process. It includes great project examples and reflects the wealth of knowledge and experience possessed by this accomplished educator. I have purchased multiple copies of this book for peers and would suggest any student who is studying a design discipline to pick up their own copy as this has quickly become the most useful book in my design collection.

Comment | Was this review helpful to you? Yes No Report abuse

⭐⭐⭐⭐⭐ **A 'Must Have'.**
By Amazon Customer on 7 April 2016

As a Design Education professional of many years standing, I endorse this book without reservation. It is comprehensive, lucid and above all, useful in a very accessible level at the coalface. Professor Bonolo has an enorrnous cache of experience as an engineer, designer and design educator and his experience is well demonstrated in this book. A 'must have' for anyone in the business of educating or being educated in the product design arena.

The Failure Project: The Story of Man's Greatest Fear
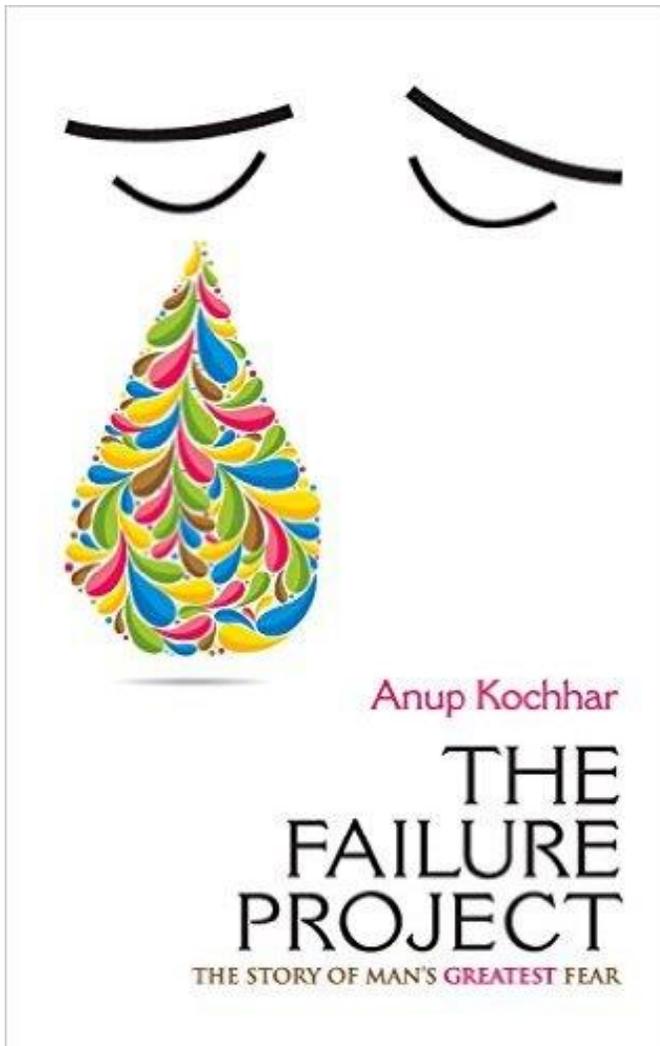
This amazing, comprehensive and compassionate book helps us understand the anatomy, psychology and management of failure - the greatest, and often the most secret, fear of Man.

Failure destroys lives. It damages confidence and crushes the spirit. Throughout our lives we endeavour to manage our thoughts, actions and results so as not to be branded as failures. Despite our best intentions, life does have a way of throwing curve balls and surprising us. Things do not always go the way we planned or wished for. Failure happens. And it will continue to happen. For most people failure is akin to a dreaded disease that must be prevented at any cost.

Failure is like fire - it has the power to singe or destroy completely. Few of us remember that failure can also be harnessed creatively. All that it requires is a different perspective.

What do we know of failure? More importantly, how much do we know about it? The first step to overcoming our inherent fear of failure is to know the enemy - inside and out.

The book is now available in paper back and as an e-book from Amazon

http://www.amazon.in/Failure-Project-Story-Mans-Greatest/dp/9352015789/ref=sr_1_1?ie=UTF8&qid=1461578229&sr=8-1&keywords=the+failure+project

http://www.amazon.in/Failure-Project-Story-Mans-Greatest/dp/9352015789/ref=sr_1_1?ie=UTF8&qid=1461578229&sr=8-1&keywords=the+failure+project

TAPPING INTO
HIDDEN
HUMAN CAPITAL

How Leading Global Companies Improve their
Bottom Line by Employing Persons with Disabilities

DIS ABILITY

DEBRA RUH

GOOD
PRACTICES OF
ACCESSIBLE
URBAN DEVELOPMENT

*Making urban environments inclusive
and fully accessible to ALL*
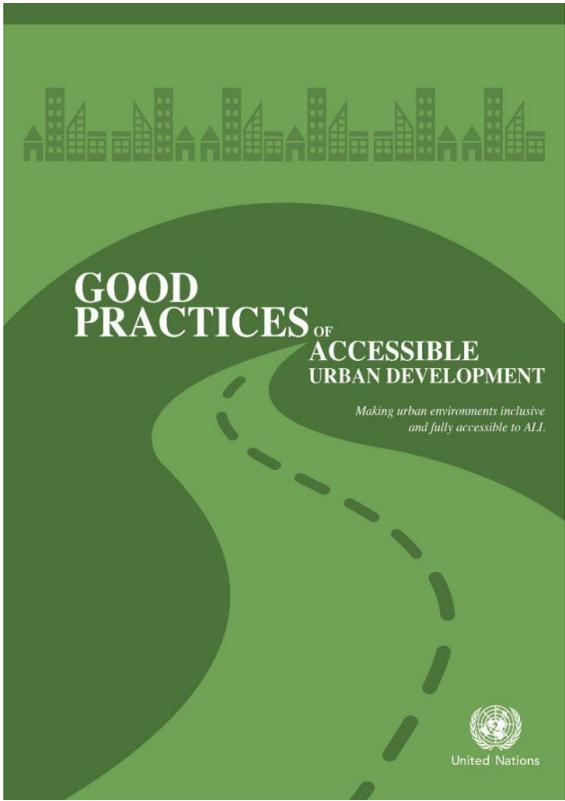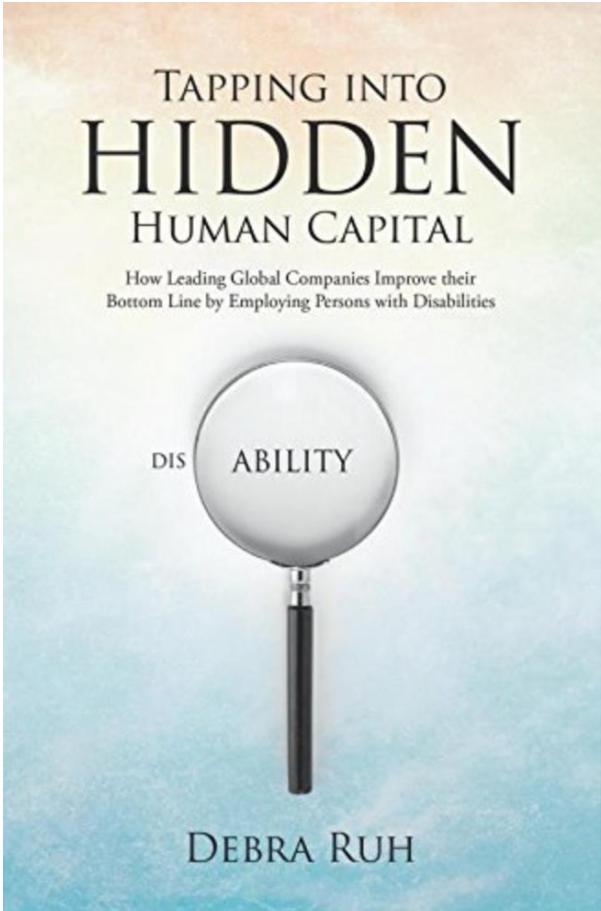
United Nations

In light of the forthcoming United Nations Conference on Housing and Sustainable Urban Development (HABITAT III) and the imminent launch of the New Urban Agenda, DESA in collaboration with the Essl Foundation (Zero Project) and others have prepared a new publication entitled: "Good practices of accessible urban development".

The publication provides case studies of innovative practices and policies in housing and built environments, as well as transportation, public spaces and public services, including information and communication technology (ICT) based services.

The publication concludes with strategies and innovations for promoting accessible urban development.

The advance unedited text is available at:http://www.un.org/disabilities/documents/desa/good_practices_urban_dev.pdf

Appeals

ave a glance at " https://www.canvasflip.com/index.php " .

CanvasFlip enables prototype presentation, efficient collaboration between design and engg teams(design handoff
) as well as quick usability testing.

Give it a shot and awesomize UX.

Also please do share your opinion and feedback.

Here is a quick Introduction link, " Quick introduction to CanvasFlip - Remote user testing and rapid app prototyping "

Quick introduction to CanvasFlip - Remote user testing a...

News

1.

Inclusive education vital for all, including persons with disabilities: UN rights experts

Inclusive education is central to achieving high quality education for all learners, including those with disabilities, and for the development of inclusive, peaceful and fair societies, UN human rights experts have said in authoritative new guidelines on the Convention on the Rights of Persons with Disabilities.

"Millions of persons with disabilities are denied an education, and for many more, education is available only in settings where they are isolated from their peers," the experts from the Committee on the Rights of the Persons with Disabilities said in the guidelines published today, according to a news release issued by the Office of the UN High Commissioner for Human Rights (OHCHR).

Education of persons with disabilities is often poor quality, sets low expectations and limits learners' opportunities, the Committee noted in the news release, adding that by contrast, a truly inclusive learning environment values the contribution and potential of persons with disabilities, and equips them with essential life, language and social skills.

"The right to inclusive education means transforming culture, policy and practice in all formal and informal educational environments to ensure education is for all learners," said Committee Chairperson Maria Soledad Cisternas Reyes in the news release. "Inclusive education is important not only for persons with disabilities but the societies they live in, as it helps to combat discrimination, and to promote diversity and participation."

The guidelines – technically referred to as a General Comment – provide guidance for the 166 States that have ratified the Convention on meeting their obligations under Article 24, under which "States Parties shall ensure an inclusive education system at all levels and life-long learning."

"Enabling inclusive education requires an in-depth transformation of education systems in legislation, policy and the way education is financed, administered, designed, taught and monitored," said Ms. Cisternas Reyes. "We hope our General Comment will guide and aid States toward achieving this goal."

The General Comment stated that placing students with disabilities in mainstream classes without accompanying structural changes to organisation, curriculum and teaching and learning strategies, does not constitute inclusion.

Rather, the General Comment said, inclusive education focuses on the full and effective participation, accessibility, attendance and achievement of all students, especially those who, for different reasons, are excluded or at risk of being marginalized.

It means the entire education system, whether state-run or private, must be accessible, including buildings, information and communication, education materials, teaching methods, assessment, language and support services, school transport, water and sanitation facilities at schools, school cafeterias and recreational spaces, the General Comment stated.

 2.

Ras Al Khaimah to host UAE World Tourism Day Conference

Ras Al Khaimah will host the UAE's World Tourism Day Conference under the theme 'Tourism for All – Promoting Universal Accessibility'. This is the second World Tourism Day conference being held in Ras Al Khaimah.

The conference is associated with the 2016 United Nations World Tourism Organisation (UNWTO) World Tourism Day focus on 'Accessible Tourism', which is being held on 27 September in Thailand. An annual UNTWO organised event, World Tourism Day seeks to promote responsible, sustainable and universally accessible tourism.

The half-day conference, which will be held on Thursday 29th September at the Ras Al Khaimah Convention Centre, will include a keynote address from H.H. Sheikh Saud bin Saqr Al Qasimi, Supreme Council Member and Ruler of Ras al-Khaimah.

The UAE's World Tourism Day Conference will bring together international leaders in tourism to stand before an audience of key industry stakeholders from across the UAE to discuss important matters that strengthen the tourism industry in Ras al Khaimah and in the UAE.

Among the keynote speakers is Ivor Ambrose, Managing Director of the European Network for Accessible Tourism (ENAT) and one of the world's leading experts in policy and research into disability and ageing, ccessible tourism and its social-economic impact.

"Ivor is flying direct from the UNTWO World Tourism Day event in Bangkok to attend the Ras Al Khaimah conference and has expressed his keen support of our commitment to open the debate on accessibility for all within the UAE," noted Haitham Mattar, CEO, Ras Al Khaimah Tourism Development Authority, who will also address the conference.

Since its inception in 1980, World Tourism Day is celebrated annually to foster international awareness of the importance of tourism, its social, cultural, political and economic value, and its potential to contribute to reaching the Sustainable Development Goals which address some of society's most pressing challenges.

The UNWTO strongly encourages nations to guarantee that all tourist facilities, products and services are accessible for all people. This accessibility is crucial to attain sustainable tourism policies.

Ras Al Khaimah Tourism Development Authority also sees the conference as an opportunity to demonstrate the emirate's capabilities in staging high profile meetings. "We are supporting the development of our MICE profile with the creation of an events calendar for the destination, which we anticipate will act as a spur to attract additional meetings, convention, incentives and exhibition business," added Mattar.

(Source: menafn)

Programme and Events

Photo: Delfino Sisto Legnani. Graphic Design: Groupa Ee

FARAWAY, SO CLOSE
25th Biennial of Design
Ljubljana, Slovenia
25. 5.. 29. 10. 2017

The 25th edition of the Biennial of Design in Ljubljana is set to strengthen its role as an interdisciplinary collaborative platform where design is employed as a catalyst for change.

BIO 25, under the title *Faraway, So Close*, will be curated by Angela Rui, a Milan- and Rotterdam-based design critic and curator, and Maja Vardjan, curator of Museum of Architecture and Design (MAO).

In line with their focus on the humanistic side and expression of design, they will use the Biennial to decode through design the effects of environmental changes, asset migration, and reactions to the systemic crises.

In the face of the total failure of the theory of Positivism, we are now forced to confront the crucial and still largely hidden meaning of the consequences of "post-modernization", for which the city seems to have lost its authority as the territory where we look to find the source of quality existence.

Small changes are already taking place and gaining ground, and new inputs are slowly modifying our urban and rural environments. New frictions emerge out of the co-habitation of remote meanings and contemporary habits, as we look for new territories to signify, places to re-inhabit, ancient relations to re-enact, basic coexistences to re-imagine. Can this friction between distant conditions produce new scenarios for a different present time?

Along with the main subject-themes of the biennial, BIO 25 will de-centralize and will be interpreted as a shift towards new territories to be seduced by research and discourse, as well as by the idea of an event with which to produce knowledge. In the age of super information consumed in real time, the challenge of a biennial becomes increasingly closer to real conditions of everyday systems; to provoke and challenge the paradigms related to design and architecture through their pragmatic application, acting as a "permanent work in progress".

Slovenia, in accordance with its geographical conditions, will perform as a paradigm to stimulate, discuss and test the status of this global shift.

SAVE THE DATE FOR THE 25TH BIENNIAL OF DESIGN

Open Call   **12 May - 5 July 2016**
Kick-off event **15 September 2016**
Process   **Autumn 2016 – Spring 2017**
Exhibition   **25 May – 29 October 2017**

Typography Day 2017

Department of Integrated Design,
University of Moratuwa, Sri Lanka.

23rd - 25th Feb 2017

WORLD HUMANITARIAN SUMMIT

WE WANT TO HEAR FROM YOU

1 8 4 5 people have participated from
1 5 7 countries

The World Humanitarian Summit is seeking ways to better meet the needs of people affected by conflicts and disasters.
Show your support for the actions needed to make humanitarian action fit for future crises.
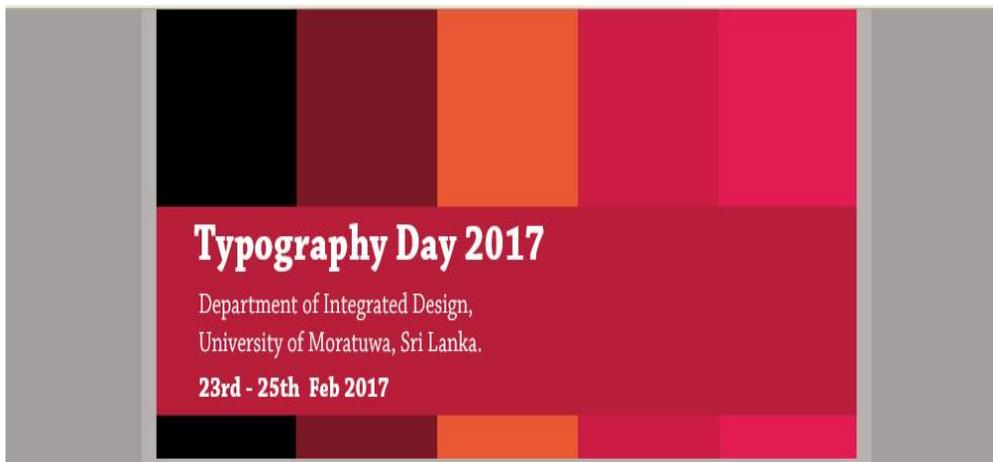
DESIGN EXPERIENCE is an initiative conceived by designers, made possible through designers and directed to designers.

We organize **a one-week intense seminar in Barcelona** where we explore the main concepts of Office Management, Project Management, Teamwork, Customer and Space Psychology, Creative Process, Sustainable and Ethic Design.

Important Barcelona designers will open the doors of their offices for us, will show us their construction sites and will tell us about the way they work.

We organize visits and round trips in the most important factories, showrooms, retails, places and sites in the area of Barcelona.
We discuss in a design environment about the most advanced topic about the design process

International Labour Organisation (ILO) – Ministry of Tourism – Red Sea Governorate – Egyptian Hotel Association

Red Sea Accessible Tourism Competition 2016
"Tourism for All"

India

FOCUS

Typographic Culture

TYPE OF CAMP

Cultural Immersion Learning

GROUP SIZE

12

PRICE

SPECIFIC DATES
January 2017

LOCATION

Chennai and Delhi

Registration starts on

September 1, 2016 @ 12:00 AM

Joseph Binder Award 2016

6th IFIP TC.13 International Conference on Human-Computer Interaction - INTERACT 2017
Theme: Global Thoughts, Local Designs
at IDC, IIT Bombay25-29 September, 2017http://interact2017.org/

Cybathlon 2016 Homepage

Cybathlon Symposium, October 6, 2016

14TH PARTICIPATORY DESIGN CONFERENCE
15-19 AUGUST 2016 | AARHUS, DENMARK

The 13th International Conference on Cooperative Design, Visualization and Engineering Oct. 24-27, 2016, Sydney
Email: cdve2016@cdve.org
Web: [CDVE2016: The 13th International Conference on Cooperative Design, Visualization and Engineering](#)

Dedicated to M P Ranjan

INDIA'S BEST DESIGN STUDIO AWARDS 2016

Now endorsed by

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International
CONFERENCE ON DESIGN
CODE
2016

International Conference on 3D Printing and Rapid Manufacturing
at the School of Fashion and Design, GD Goenka University, Sohna, Gurgaon, Haryana,

17- 18December2016
http://www.designconference.in/

Universal Design: Live & Learn (UDLL2017) is a collaborative conference offered in partnership with PATHS, Create West Virginia, RL Mace Universal Design Institute, CAST, WVU Center for Excellence in Disabilities and the Northeast Regional Center for Rural Development.

UniversalDesign.Today
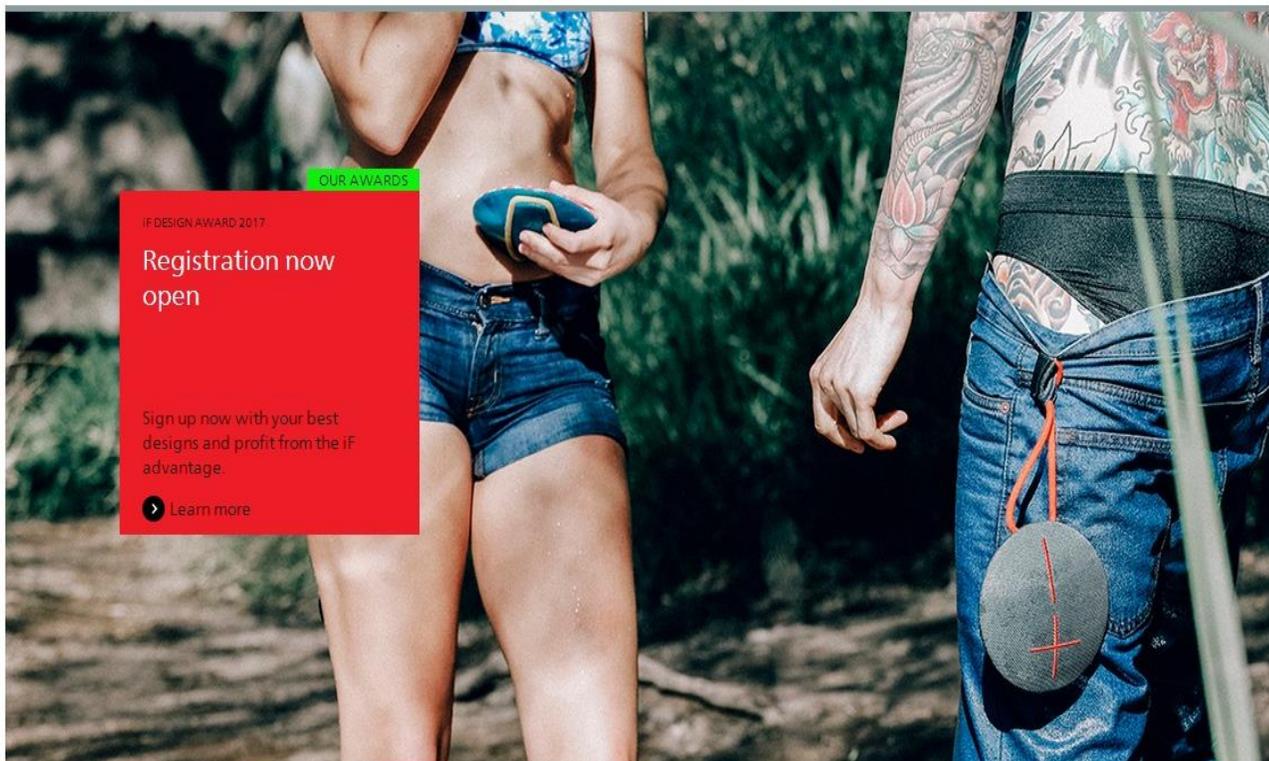
OUR AWARDS

iF DESIGN AWARD 2017

Registration now open

Sign up now with your best designs and profit from the iF advantage.

Learn more
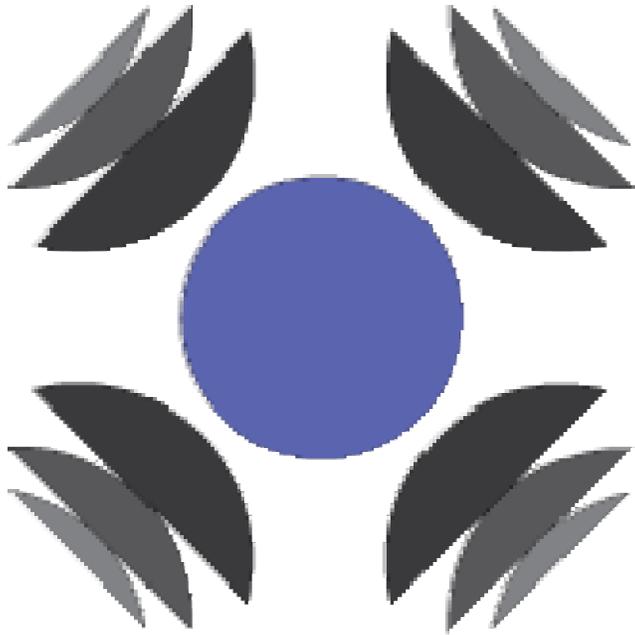
3 Day Workshop:
'Exposure to Product Design and Innovation'

25 - 27 August 2016 at IDC, IIT Bombay
http://www.idc.iitb.ac.in/events/expo-pd-in-2016.html

TypographyDay 2017 Focus on 'Typography and Diversity'

23- 25 February 2016

by **Department of Integrated Design**, **University of Moratuwa**, **Sri Lanka at**

Colombo, Srilanka Call for Abstract for Papers (deadline 31 August 2016)

Call for Poster Design (deadline 31 October 2015) **http://www.typoday.in**

The 3rd Edition of Alpavirama Asian Short and Documentary Film Festival (http://www.nid.edu/alpavirama/index.html), organised by the Film & Video department of the National Institute of Design is going to be held between 4-8 October, 2016 at its Paldi, Ahmedabad campus.

Entries are invited from students/amateurs/professionals below 30 years of age for the SOUTH ASIAN COMPETITION section of Alpavirama 2016. Short fiction and documentary films, not-less-than 5 minutes and not-more-than 30 minutes long are eligible to participate. The film(s) should have been produced on or after 1st August, 2014 and should have been directed by a citizen of any of the following countries: Afghanistan, Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, Pakistan and Sri Lanka. Animation films are not eligible.

The last date for receiving the completed entry form along with the preview material is 1st July, 2016.

Principal Faculty & HOD, Film & Video, NID
Festival Director: Alpavirama 2016

PADES
Pennsylvania Disability Employment and Empowerment Summit

PADES, PA Disability Employment & Empowerment Summit, aims to bring together employers, related government agencies, service providers and people with disabilities, to discuss challenges, opportunities, case studies of programs of excellence, advancements in adaptive technology, supports, suggestions for systems improvements, and other important topics.

Registration Now Open!

General Registration   Exhibitors Registration

Monday, October 17 & Tuesday, October 18, 2016
Bayfront Convention Center
Erie, PA

core77
conference
designing
here/now

2016   SEPTEMBER 29 – 30
        LOS ANGELES, CA

The Core77 Conference returns to L.A.'s vibrant design community — same venue, more activity. This year, we've put together two days of panels and presentations, workshops and tours, catered meals, and fabulous evening receptions. Come join designers, scientists, entrepreneurs, and business leaders in exchanging innovative ideas on working and tools for cultivating exceptional interdisciplinary success.

THE BERKELEY PRIZE 2017

Essay Competition
Travel Fellowship Competition

ARCHITECTURE REVEALS COMMUNITIES

ARCHITECTURE IS A SOCIAL ART

The BERKELEY PRIZE supports the study and teaching of the *social art of architecture*.
The online, two-stage Essay Competition (in English) is open to undergraduate architecture majors in accredited schools of architecture throughout the world. The Travel Fellowship Competition is open to the Essay Competition semifinalists.

PURSE

Essay Competition: 25,000 USD; 5,750 USD first prize; Multiple prizes
Travel Fellowship Competition: Stipend and airfare; Multiple prizes

2017 JURORS

Sangeeta Bagga-Mehta
Architect; Professor, Chandigarh College of Architecture, Chandigarh, India where she has conducted multiple collaborative student workshops focused on the examination of urban landscapes, environmental design and social issues; Internationally-recognized figure in modern heritage conservation and urban social history studies of Chandigarh; and Member, BERKELEY PRIZE Committee.

Mark L. Gillem
Architect (FAIA) and Planner; Professor, architecture and urban design, University of Oregon, Eugene, U.S.A.; Director, School of Architecture's Ph.D. Program and the Urban Design Lab; Director of the International Association for the Study of Traditional Environments (IASTE); Principal of The Urban Collaborative, LLC, Eugene; and author of *America Town: Building the Outposts of Empire*.

Omar Khattab
Architect; Dean, College of Architecture and Chair of the Department of Architecture, Kuwait University; Responsible for major design projects including the Care Centre for the Mentally Disabled and the Kuwait Autism Centre; elected representative on the managing board of the RIBA Gulf Chapter; and co-author of *Cities in Transition: Transforming the Global Built Environment*.

Faiq Mari
Architect; Former student, teacher and BERKELEY PRIZE Associate Teaching Fellow, Birzeit University, Palestine; current Fulbright scholar at the University of Michigan, Ann Arbor, U.S.A., studying the role of the built environment under settler colonialism in Palestine; Second Prize, 2013 BERKELEY PRIZE Essay competition; and Member, BERKELEY PRIZE Committee.

BEGIN ONLINE: WWW.BERKELEYPRIZE.ORG

Job Openings

1. Job Opening

UNBOX creative studio is looking for passionate industrial design and graphic design interns for it's Pune studio. Interested candidates may get in touch with me at kunal@unboxstudio.in. Freelance designers with 1 year experience may also apply.

2.Job Opening

The Design Research team at Dropbox is looking for a Research Manager to direct research activities across our new collaboration products. Paper is one of the products this team is working on, but there are other early-stage initiatives as well. This product area is full of interesting design challenges, and we need a research leader to partner with this talented, cross-functional team.

You don't need to have management experience to be considered for this role, but you must be passionate about supporting and training other researchers.

Apply! And feel free to reach out to me via email with any questions about the team or the role.

3.Job Opening

We have 2 open positions for Interaction Designer (4+ years exp)

Interested candidate please send your resume to ajadhav@opentext.com, mentions subject as "UX - Interaction Designer position @OpenText - Hyderabad - 2016"

Position Description: OpenText Enterprise Information Management (EIM) technologies and business solutions allow organizations to take full advantage of enterprise information to gain better business insight, capitalize on opportunities to positively impact the business, improve process velocity, reduce risks related to information governance, and protect sensitive information and intellectual property from internal leaks and external threats. With growing volumes and a host of formats to manage and leverage, organizations need to bring structure to the unstructured. By doing so, they will be unleashing the power of information to drive faster decision making, improved agility, strong security policies, and an increased ability to both exploit the opportunities and control the risks of enterprise information.

OpenText provides solutions across the entire range of core EIM capabilities – sophisticated, secure, high-value, and cost-effective – onsite, via mobile devices, private cloud, or in the cloud.

User Experience Designers at Open Text research, design, prototype and test software products that solve critical business needs of our customers. Through a sound understanding of the underlying architecture, product vision and requirements, we create compelling, usable user interfaces for complex enterprise software applications across desktop, web, tablet and mobile platforms. We work as essential development team members in a highly collaborative, agile environment to create industry leading Enterprise Information Management software solutions.

Must be self-motivated with ability to work both independently and in conjunction with other UX team members and product groups. Enthusiasm and flexibility to work on a variety of projects are necessary, as well as the ability to rapidly acquire new

domain knowledge. Must have the ability to balance business needs and usability / design ideals within a fast-paced, agile software development environment.

 Responsibilities

- Maintain sound understanding of the underlying architecture of the system being developed in order to create designs that are both supported and work within defined technical constraints.

- Conceptualize, design and deliver intuitive and compelling designs for a complex, multiplatform (windows desktop, mac desktop, iOS mobile, iOS tablet, Android mobile, Android tablet, blackberry mobile, web/browsers, Java, etc.) product suite that clearly support customer needs and business objectives.

- Work with R&D leadership, Product Management, and Architecture teams to create a shared understanding of the impact of technical, architectural, and platform decisions on the user experience.

- Create interactive prototypes as proof of concept of the software product solution, serving as the starting point for requirements validation, conceptual design validation and basis for iterative development activities.

- Work within product development teams to guide and support day to day technical decision making that impacts the user experience.

- Support Program and Product Management by performing user research, developing ongoing relationships with customers to build a shared understanding of their problems and needs.

- Work with Product Management in helping to define requirements that create the product backlog and define the user experience vision for the product.

- Act as subject matter expert on the user experience capabilities, limitations, and tradeoffs presented by various platforms, technologies, and frameworks.

- Identify and create user personas, buyer personas, and usage scenarios.

- Advocate user needs throughout the development lifecycle in an agile/iterative environment to ensure the team develops the right product.

- Validate designs with customers and other stakeholders through usability testing and statistical analysis of results in order to drive iterative improvements throughout the development lifecycle, as well as establish usability test measurements through a standardized scorecard.

- Coordinate among multiple designers supporting a suite of products, line of business or business unit.

- Maintain a cohesive user experience strategy for area of immediate responsibility and coordinate with other designers on cross-company UXD strategy. Researches and evaluates new product UXD support opportunities.

- Participate in customer site visits, beta test visits, customer briefings, customer councils, user group meetings, technical conferences, seminars, etc. as appropriate and as budget permits. Creatively engage with customers via virtual councils, webex sessions, and other remote technologies, especially when limited budget opportunities persist.

- Mentor peers, stakeholders, and teammates on customer-centered design principles and methodologies.

- Contribute to and help champion User Experience Design team initiatives, such as creation of design guidelines, process enhancements, toolkits, etc., fostering a customer-centered culture.

- Bring awareness of competitive software and emerging advances in the User Experience field, including interaction design, usability, user-centered design methods and state-of-the-art user interface technology into the company.

Position Requirements:

Education

- Degree in HCI, Human Factors Engineering, Cognitive Science, Interaction Design, Computer Science, Industrial Design, Graphic Design or related experience. Master's preferred.

Minimum of 5 plus years of strong software interaction design experience reflected through portfolio / work samples demonstrating the following skills:

- 5+ years working with an experience design team... applicants with eclectic backgrounds welcome

- Prototyping (paper and click-through interactive)

- Usability test creation, including scripts, metrics and standard testing protocol.

Desired:

- Passionate about creating products that best serve the needs of the user

- Effective at influencing and convincing colleagues, and highly motivated to effect change

- Strong analytical and problem solving skills, with the ability to conceptualize complex systems

- Demonstrated results-oriented work ethic and consistent record of meeting deadlines

- Excellent listener, facilitator, communicator, and team player

- Self-reliant, used to taking initiative, and great at follow-up

- Creative, with solid understanding of interaction design best practices / principles

- Requirements gathering and analysis

- Creation of user personas

- Task and workflow analysis

- Heuristic evaluation and expert walkthroughs

- Statistical analysis of results and creation of reports including a standardized usability test scorecard.

- Good analytical and organizational skills including the ability to organize and prioritize tasks

- Ability to work both independently and in a highly collaborate environment as part of a global User Experience Design team

- Ability to shift among multiple projects as needed in rapid, agile software development environment

- Goal driven; plans and manages toward achieving goals, anticipates problems and issues and proactively drives their resolution

- Prior experience doing UX within an Agile environment would be an asset

- Experience with a variety of UI design and prototyping tools, e.g. Visio, Photoshop, Dreamweaver, Axure, Balsamiq, Flash, etc.

- Web Development (HTML, CSS, PHP, JavaScript) and Flash experience a plus

- Knowledge of GUI accessibility standards (Section 508, WCAG, etc.) a plus

- Knowledge of Enterprise Content Management (ECM) products would be an asset

- Strong technical background with the ability to quickly understand complex technical, architectural, and platform tradeoffs and provide guidance on their impact on the end user experience.

- Experience designing complex enterprise applications

- Experience in ECM, SAP, RM, BPM, ERP, WCM preferred

- UI development experience on web, desktop, or mobile platforms a plus

- Knowledge of UI development languages and tools (e.g. HTML, CSS, JavaScript, Flash, Java, C++) an asset

4. Job Opening

Tata Elxsi is looking forward to hiring Industrial designers for the Product/ Packaging Design Team in Bangalore.

Designers with an experience of 1- 3 years. Freshers with a decent portfolio and good CAD modelling skills are also welcome to apply.

The Product Design team at Tata Elxsi work on a wide range of Products across Industry verticals, which are in turn used by millions of people. Tata Elxsi has been recently awarded the Best Industrial Design Studio by POOL magazine.

Please mail your portfolio and resumes to prasadnimbalkar@tataelxsi.co.in

5.Job Opening

Great Learning is looking for a Graphic Designer to work with their marketing team and provide creative and design support for marketing campaigns, web and collateral design as well as revamp our web and social presence.

Please direct all queries and communication to - harish@greatlearning.in

For free Registration: write to
subscribe@designforall.in

Write to us about change of
e-mail address:
address@designforall.in

Contact *Design for All Institute of India*

Advertising:

To advertise in digital Newsletter

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Acceptance of advertisement does not mean our endorsement of the products or services by the Design for All Institute of India

News and Views:

Regarding new products or events or seminars/conferences/ workshops.

News@designforall.in

Feedback:

Readers are requested to express their views about our newsletter to the Editor

Feedback@designforall.in

Dear Friends,
We need your feedback on our publication and your support for popularizing the concept of our social movement of Design For All/ Universal/ Barrier free/ Inclusive Design. It is our further request kindly submit your latest articles, research findings , news and events with us for publication in our newsletter.
With regards
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Forthcoming Events and Programs:

Editor@designforall.in

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