

QUARTERLY OF THE INDUSTRIAL DESIGNERS SOCIETY OF AMERICA **SUMMER 2012**

INNOVATION

Wounded Warriors + Design

BIOMIMICRY ■ SHOWCASE ■ OBSOLESCENCE





radiuspd.com



smart watching

The e-sync watch gives you the freedom of motion, by instantly displaying all notifications from your smartphone.



Concept by Radius Senior Designer Mario Gonzalez

QUARTERLY OF THE INDUSTRIAL DESIGNERS SOCIETY OF AMERICA

SUMMER 2012

INNOVATION®



Publisher

Roxann Henze
IDSA
555 Grove Street, Suite 200
Herndon, VA 20170
P: 703.707.6000 x102
F: 703.787.8501
roxannah@idsa.org
www.innovationjournal.org

Executive Editor

Mark Dziersek, FIDSA
Managing Director
LUNAR | Chicago
mark@lunar.com

Advisory Council

Gregg Davis, IDSA
Alistair Hamilton, IDSA

Managing Editor & Designer

Karen Berube
K.Designs
3511 Broadrun Dr.
Fairfax, VA 22033
P: 703.860.4411
k.designs@cox.net

Contributing Editor

Jennifer Evans Yankopolus

Advertising

Katie Flegler
IDSA
555 Grove Street, Suite 200
Herndon, VA 20170
P: 703.707.6000 x104
F: 703.787.8501
katief@idsa.org
advertising@idsa.org

Annual Subscriptions

Within the US	\$60
Canada & Mexico	\$75
International	\$110

Single Copies

Fall/Yearbook	\$35+ S&H
All others	\$17+ S&H

The quarterly publication of the Industrial Designers Society of America (IDSA), *Innovation* provides in-depth coverage of design issues and long-term trends while communicating the value of design to business and society at large.

WOUNDED WARRIORS

- 24 Doing It by Design**
by Patricia Moore, FIDSA
Guest Editor
- 26 Redesigning the Great American Pastime: Play Ball!** by Jason Billingsley and David Van Sleet
- 28 A Rehabilitation Center Design Project for Wounded Warriors: *Daring to Care***
by Vibhavari Jani
- 32 Support from a High-Tech Lab—or the House Next Door: *From a Myoelectric Mouse to a Hammer and Nail*** by Stephen Karl and Julie Fisher
- 35 Arming Our Veterans**
by Dean Kamen
- 38 The Wounded Warrior Homes: *An Agile Discourse Between Dualities***
by Altay Sendil and Hilary Hoerber
- 42 An In-Depth Look**
by Michael Graves & Associates
- 45 An Inclusive Consumer Research Perspective: *Coming Home***
by Brian McMahon and Joyce Chung

- 48 Extreme Learning for Everyday Design: *Lessons from the One-Handed World***
by Kelley Styring

FEATURES

- 13 Design Obsolescence: *A Thing of the Past*** by Tony Kawanari, IDSA and Gabriel Botkins
- 16 Biomimicry & Design Education: *Shaking Hands with a Sloth*** by Adelheid Fischer
- 22 Consumer Collaboration: *Setting Off an IdeaStorm™***
by Gary Grossman, IDSA

IN EVERY ISSUE

- 4 From the Executive Editor**
by Mark Dziarsk, FIDSA
- 6 Business Concepts**
by Ravi Sawhney, FIDSA
- 8 Letters to the Editor**
- 10 Design Defined**
by Scott Summit
- 12 Book Review**
by Scott Stropkay, IDSA
- 53 Showcase**
- 64 Signposts**
by Alistair Hamilton, IDSA

PATRONS OF INDUSTRIAL DESIGN EXCELLENCE

INVESTOR

IDEO, Palo Alto, CA; Shanghai, China; Cambridge, MA; London, UK; San Francisco; Munich, Germany; Chicago; New York
Jerome Caruso Design Inc., Lake Forest, IL
Masco, Taylor, MI
Procter & Gamble, Cincinnati, OH
Webb deVlam Chicago, Chicago, IL

CULTIVATOR

Altitude, Somerville, MA
Cesaroni Design Associates Inc., Glenview, IL
Continuum, Boston; Los Angeles; Milan, Italy; Seoul, South Korea; Shanghai, China
Crown Equipment, New Bremen, OH
Dell, Round Rock, TX
Design Concepts, Madison, WI
Eastman Chemical Co., Kingsport, TN
Hewlett-Packard, Palo Alto, CA
IDI/Innovations & Development Inc., Edgewater, NJ
Lunar Design Inc., Palo Alto, CA
Metaphase Design Group Inc., St. Louis, MO
Nokia Design, Calabasas, CA
Smart Design, New York; San Francisco; Barcelona, Spain
Stanley Black & Decker, New Britain, CT
Teague, Seattle, WA
Tupperware, Worldwide

Charter Patrons indicated by color.

For more information about becoming a Patron and supporting IDSA's communication and education outreach, please contact Dawn Hatzer at 703.707.6000 x119.

“The Wounded Warrior Complex helps injured combat veterans to find independence and new hope.”

Wounded Warrior Complex, Camp Pendleton, CA (left) designed by Parron Hall Office Interiors for US Marine Corps; www.dirtt.net



Cover photo: Marine Captain and Iraqi Vet Jonathan Kuniholm wearing a prototype of a neurally controlled prosthetic arm developed by the DARPA Revolutionizing Prosthetics project. Mike McGregor / Contour by Getty Images

Innovation is the quarterly journal of the Industrial Designers Society of America (IDSA), the professional organization serving the needs of US industrial designers. Reproduction in whole or in part—in any form—without the written permission of the publisher is prohibited. The opinions expressed in the bylined articles are those of the writers and not necessarily those of IDSA. IDSA reserves the right to decline any advertisement that is contrary to the mission, goals and guiding principles of the Society. The appearance of an ad does not constitute an endorsement by IDSA. All design and photo credits are listed as provided by the submitter. *Innovation* is printed on recycled paper with soy-based inks. The use of IDSA and FIDSA after a name is a registered collective membership mark. *Innovation* (ISSN No. 0731-2334 and USPS No. 0016-067) is published quarterly by the Industrial Designers Society of America (IDSA)/*Innovation*, 555 Grove Street, Suite 200, Herndon, VA 20170. Periodical postage at Sterling, VA 20164 and at additional mailing offices. POSTMASTER: Send address changes to IDSA/*Innovation*, 555 Grove Street, Suite 200, Herndon, VA 20170, USA. ©2012 Industrial Designers Society of America. Vol. 31, No. 2, 2012; Library of Congress Catalog No. 82-640971; ISSN No. 0731-2334; USPS 0016-067.

Advertisers' Index

- c3** 2012 IDSA Conference
7 Conwed
1 LaFrance Corp.
c4 Lunar
8 MIT Press
c2 Radius PD
9 Stratyasys

Far Left: More Showcase submissions on page 53.





By Kelley Styring

kelley.styring@insightfarm.com ■ www.insightfarm.com ■ www.theonehandedworld.blogspot.com

Consumer strategist Kelley Styring is a Procter & Gamble and Frito-Lay market-research veteran whose firm, InsightFarm, consults with Fortune 100 companies. Styring (née Schofield) interned at Black & Decker with Carroll Gantz, FIDSA, while earning a degree in industrial design from the University of the Arts in Philadelphia under Dr. Noel Mayo, IDSA.

Extreme Learning for Everyday Design

LESSONS FROM THE ONE-HANDED WORLD

In the world of market research, studying extreme populations isn't a popular idea. The problem, we're told, is that the extreme populations are too small and difficult to find (i.e., expensive) and that we can't extrapolate our findings to the general population (i.e., not profitable). I don't believe this.

As a researcher for Procter & Gamble, I traveled around the world learning how different people diaper their babies so that the company could design, produce and market better diapers. As part of that, I studied what I consider to be an extreme population: mothers of triplets. As a mother myself, I know that having one baby is challenging. Having *three*? Yikes. But I found that these mothers of multiples become extremely efficient and develop shortcuts that are helpful for all mothers. That's because they learn to improvise and make products work that weren't designed for their particular situation. We call this a compensatory behavior, one critical element in identifying next-generation products.

And do you remember the metrosexuals, those men in the 1990s who were deeply invested in personal grooming and used products made for women? Another extreme population studied. As a result, beauty-care companies were inspired to create an entirely new category of skincare and styling products aimed at men, an entirely new market. Today, some very manly sports figures are pitchmen for men's grooming products, made by companies that used to only make products for women.

So when I became intrigued by the dramatic rise in smartphone usage, I started to think about one-handedness. My own experiences include failures like dropping my cellphone into an open cup of latte while driving and triumphs like opening, applying and successfully recapping a lipstick—all one-handed—during a telephone conversation. People have been multitasking for years, but I wondered: **Is the constant use of the handheld mobile device changing us?** And if so, what are the implications for consumer products and packaging? How to find out?

Photos: John C. Thomas, Fisheye

WOUNDED WARRIORS

Then it hit me: Who better to teach us about living in a one-handed world than the ultimate extreme population? Arm amputees live elegantly and efficiently with only one hand, every day. By understanding the challenges of living in the one-handed world, I could discover some of the solutions and compensatory behaviors as well. And that could lead us to design and create better products and packages for everyone.



Illustration: Geoff Marko, Brandhouse Inc.

Indeed, while studying an extreme population can provide insights that can benefit all consumers, in the One Handed World study I found that it could take us a step further. While most market research captures the consumers' past, this study provides us with a very rare glimpse into the consumers' future—in a word, providing us with *foresight*. With this study, smart designers have the opportunity not only to understand where consumers are headed in the future but also to get there first with new designs to meet the consumers' new needs.

My career as a designer both led me down the path to becoming a market researcher and informed my consumer strategy practice. At Black & Decker, and later as a human factors designer at NASA, I discovered that my design work was always enhanced by people called market researchers. More recently, I have found that being a designer has made me a better researcher. My role is to inspire creativity and innovation on behalf of the consumer and help companies not just see their products and services as they are, but to reimagine them as they could be.



Logo: Mark Hilvert

Fascinating Findings

One of the greatest barriers to studying extreme populations in the past was how difficult it was to simply find and recruit them. Reaching arm amputees, while not a simple effort, was made much more feasible through technology and social networks. Leveraging one contact to create three, InsightFarm was able to tap into an insular population and build the relationships needed to gain access and collect information. Within a year, we created a community of amputees willing to participate in the One Handed World study.

Participants reported how they interacted with and were challenged by nearly 250 everyday products and packages across 18 different categories, along with specific moments of interaction that are difficult and the reasons they are difficult. The same measurements were made among the two-handed population for comparison, along with questions about how they spend their days. The results were surprising.

Overall, one-quarter of amputee respondents found everyday products difficult to operate with one hand, with the degree of difficulty increasing with the complexity of the task. I was stunned at the number of products that two-handed consumers reported difficulty opening or using—even when both hands were fully available. And they reported difficulties in the majority of the same categories as the one-handed consumers, which means the issue isn't with the consumer, it's with the *product* or the *package*.

Additionally, I discovered that two-handed consumers now spend the majority of their waking hours, 40 percent, with one hand occupied. As a result, they attempt to interact with a variety of other products and packages using a single hand or finger. While multitasking itself isn't a new activity, the dramatic surge in the use of handheld technology is driving a permanent change in human behavior. The cellphone was identified as the second most common item occupying the hand, behind only carrying things.

Basically, we are living in a one-handed world. People are on the go and trying to get more done in less time, so they desperately need products and packages designed to accommodate that lifestyle. The One Handed World study

has found that one-handed convenience creates delight and engenders loyalty in consumers. A product that is easy to use with a single available hand creates a tremendous competitive advantage for itself in the marketplace. It is also an opportunity to boost profits, since consumers will pay a premium for convenience.

Reimagine the Ordinary

It is time for products and packaging to change. This imperative isn't about specialized high-tech gadgets or \$100 shoelaces for amputees. In fact, it is even more important for low-tech products. Items people use every day—adhesive bandages, ketchup packets, tape, yogurt cups, cereal boxes and more—could greatly differentiate themselves from competitors by being easier to use with one hand.

This concept is actually different from universal design, which provides access to everyday products and packages for those with special needs. Interestingly, this study sug-



Most Difficult Categories of Products to Open or Use

One-Handed Consumers

Rank	Category	Percent
1	Tools	49%
2	Other Foods	46%
3	Health/Medical	39%
4	Package Types	38%
5	Snacks	33%
6	Cooking and Eating	30%
	Beverages	30%
8	Sports/Recreation	27%
9	Electronics	21%
10	Personal Care	18%

Two-Handed Consumers

Rank	Category	Percent
1	Tools	58%
2	Health/Medical	48%
3	Package Types	44%
	Cooking and Eating	44%
5	Apparel	42%
6	Snacks	37%
7	Sports/Recreation	36%
8	Other Foods	33%
	Beverages	33%
10	Personal Care	27%

Of the top ten categories identified as most difficult, nine of them were *identical* between one-handed and two-handed people. According to the research, that means the issue isn't with the consumer, it's with the item they are trying to open or use.

gests that arm amputees are actually *more* capable than two-handed people in this emerging one-handed world and, as such, lead the way to the future of product and package design for everyone. Certainly not what one would expect from a study of an extreme population.

Those of us with two hands are constrained by our own experience, since we've never had to think about how we would open a package or use an item with only one hand. We assume that two hands will be available. **Studying this extreme population provides the knowledge—the foresight—that allows designers to do what they do best: step outside reality and truly experience another perspective in order to reimagine the ordinary.**

I experienced this at NASA. For the first time, we had to account for women as flight controllers. It became an incredible challenge because women presented totally different human factors. It required those of us designing (even the women) to change our perspective so as to meet the needs of everyone.

A Place to Fish

I grew up in Florida, and we fished a lot. Now, there's a lot of ocean out there, so how can you be most efficient at finding the fish? Well, you look for the birds. The birds eat the little fish, so they follow them. The little fish are also eaten by the big fish, so find the birds and you've found the best place to find the big fish. It's the same with ideas. You need to find a place that's rich with the opportunity to help you catch the big ones.

While hands-free remains the gold standard for ease of use with our extreme population, that's not always possible.

The One Handed World study has developed 17 different innovation platforms designers can use to create or improve their products or packaging. For example:

- **One-handed stabilization and manipulation:** This platform identifies products that require one hand to do two different jobs: stabilize an item and manipulate it at the same time, such as opening a jar. Can the palm be used to stabilize an item while the fingers or thumb of the same hand open it?
- **Toothiness:** Much to dentists' dismay, the third hand is often the teeth. While it may be unsafe and socially unacceptable, teeth are being used to compensate for packages that are difficult to open. Designing packages to be opened safely and hygienically with the teeth would be paradigm-breaking, rather than incisor-breaking, for consumers.
- **Air as a propellant:** What if air could be used to loosen or open a package, especially something that currently causes such difficulty for so many consumers, like cereal boxes?
- **Packages with predictable opening results:** It doesn't matter how many hands you have available to use if you can't count on a particular package to open in exactly the same way twice. Consistency counts with, and creates delight in, consumers.

In essence, it's all about facilitating usage, whether the user is an amputee, a college student on a smartphone or a busy mom trying to hang onto a toddler's hand. And thanks to the extreme users in the one-handed world, we can design a new future that makes life easier for everyone. ■

THE FUTURE IS...

IDSA 2012 INTERNATIONAL CONFERENCE • BOSTON 8.15.12 • PEOPLE TECHNOLOGY BUSINESS

Register Now.

LAURENCE GARTEL
SYD MEAD
LESLEY MOTTLA
STEFAN ANDREN
TOM DIERKING
SAM AQUILLANO
DEREK CASCIO
VALERIE FLETCHER
BOB SCHWARTZ
DAVID WALLACE
KUNPYO LEE
HARRY WEST
TED ACWORTH
MIKE & MAAIKE
NATE BALL



Snap to register or visit:
www.idsa.org/thefutureis



@idsaboston2012

WINNER.



LUNAR.COM



LUNAR'S JUNGGI SUNG
WINNER OF FAST COMPANY'S PORSCHE DESIGN CHALLENGE.



PORSCHE

FAST COMPANY



CO-DESIGN