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Tel: +1-510-601-0994, Fax: +1-510-527-1994
Web: www.AMandA.com

**Experience Design IntelliIgence**
User-Interface Development
Information Visualization

# Cross-Cultural User-Interface Design for Work, Home, Play, and On the Way

Half-Day Course Handout-Notes
SIGGRAPH 2011 Asia
Hong Kong, China
12-15 December 2011

**Aaron Marcus, President**
**Aaron Marcus and Associates, Inc., (AM+A)**
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**Facebook:** http://www.facebook.com/AMandAssociates
**LinkedIn:** http://www.linkedin.com/company/aaron-marcus-and-associates-inc-
**YouTube:** http://www.youtube.com/user/AMandAssociates
**Twitter:**
http://www.twitter.com/amandaberkeley

# Instructor's Biography

**Aaron Marcus, President, AM+A**
Mr. Marcus received a BA in Physics from Princeton University (1965) and a BFA and MFA in Graphic Design from Yale University Art School (1968). He is an internationally recognized authority on the design of user interfaces and information visualization. Mr. Marcus has given tutorials at CHI, HCII, SIGGRAPH, SIGGRAPH/Asia, and UPA, and business/university workshops around the world. He co-authored/edited *Human Factors and Typography for More Readable Programs* (1990), *The Cross-GUI Handbook* (1994), and MobileTV (2010), and authored *Graphic Design for Electronic Documents and User Interfaces* (1992), Mr. Marcus was the world's first graphic designer to do computer graphics (1967), to program a desktop publishing system (for the AT&T Picturephone, (1969-71), to design virtual realities (1971-73), and to establish an independent computer-based graphic design firm (1982). In 1992, he received the National Computer Graphics Association Industry Achievement Award. In 2000, ICOGRADA named him a Master Graphic Designer of the Twentieth Century. In 2007, the AIGA named him a Fellow. In 2008, he was elected to the CHI Academy. In 2009, UPA awarded him a service award for his five years as Editor-in-Chief of *User Experience.* He was an advisor to the AIGA Center for Cross-Cultural Design 2004-08.

Mr. Marcus is President and Principal Designer/Analyst of Aaron Marcus and Associates, Inc., a user-interface and information-visualization development firm with more than 29 years of experience in helping people make smarter decisions faster at work, at home, at play, and on the way. AM+A), has developed user-centered, task-oriented solutions for complex computer-based design and communication challenges for clients on all major platforms (client-server networks, the Web, mobile devices, information appliances, and vehicles), for most vertical markets, and for most user communities within companies and among their customers. AM+A has served corporate, government, education, and consumer-oriented clients to meet their needs for usable products and services with proven improvements in readability, comprehension, and appeal. Working with either client R+D or marketing groups, AM+A uses its well-established methodology to help them plan, research, analyze, design, implement, evaluate, train, and document metaphors, mental models, navigation, interaction and appearance. AM+A's clients include BankInter, BMW, DaimlerChrysler, eBay, The Getty Trust, HP, LG, McKesson, Microsoft, Motorola, NCR, Nokia, Oracle, Qwest, Sabre, Samsung, Siemens, Tiscali, US Federal Reserve Bank, Virgin America, Visa, Wells Fargo Bank, and Xerox. AM+A helped design the first user interfaces for America Online, Sabre's Travelocity, Microsoft's ThreeDegrees.com, and LiveScribe's SmartPen.

# Agenda for the Tutorial

| Time | Topic |
|---|---|
| **00:00** | **Workshop begins** |
| 00:00-00:15 | Lecture 0: Introduction to Content and Speaker |
| 00:15-01:15 | Lecture 1: Cross-Cultural User-Experience Design |
| 01:15-01:30 | Exercise 1: Analyze Cross-Cultural Conversations |
| **01:30-01:45** | **Break for Refreshments (approximate time)** |
| 01:45-02:00 | Lecture 2: Applying Cultural Models to UI Design |
| 02:00-02:15 | Lecture 3: Culture UI Testing Case Study |
| 02:15-02:30 | Lecture 4: Auditing Culture of Software before Localization |
| 02:30-02:45 | Lecture 5: Analyzing International Teams' Country Cultures |
| 02:45-03:00 | Lecture 6: Culture and Mobile UI Design |
| 03:00-03:15 | Lecture 7: Web 2.0 UI Design and Culture |
| 03:15-03:30 | Lecture 8: Social Network Sites and Culture |
| 03:30-04:00 | Closing Discussion/Exercise: Time permitting |
| **04:00** | **Tutorial ends (approximate time)** |

# Detailed Description and Time Allocation

**Lecture 0: Introduction to instructor and tutorial (15 minutes)**
This period will introduce the presenter(s) and to discuss how the techniques that will be discussed fit into the user-interface development process, including an introduction to globalization/localization issues. We'll show several examples of questionable cross-cultural communication and discuss several cultural anthropological theories briefly. We'll ask for participants' own experiences in difficulties of communicating across cultural boundaries.

**Lecture 1: Cross-Cultural User-Experience Design (60 minutes)**
Illustrated lecture will introduce culture theories, culture models, and culture dimensions, then discuss five exemplary dimensions of culture: (power distance, individualism *vs.* collectivism, masculinity *vs.* femininity, uncertainty avoidance, and long-term time orientation. For each dimension, we shall explain the characteristics and their potential impact of work, education, and family life, and show examples of Websites from different countries, but with the same subject matter that demonstrate indigenous cultural characteristics. Brief summary of analysis of corporate Web-design's influence by culture follows. Closes with discussion of best-of-breed culture dimensions and other dimensions that interact with culture, such as persuasion, trust, and cognition;

**Lecture 2: Applying Cultural Models to UI Design (15 minutes)**
Illustrated lecture will summarize the research of Dr. Pia Honold, Siemens Corporation, in using cultural models to predict how German and Chinese consumers gain information about mobile phone usage. This information impacts the design of documentation, online help, etc. Dr. Honold's presentation shows how the results of her study generally fit the predictions, but offer some surprises, also. We shall also show portions of a case study of developing a phone for Chinese users and a portion of a video study of mobile phone users in four countries.

**Lecture 3: Culture Website UI Testing Case Study (15 minutes)**
This lecture shows results of testing a public facing Website among users from 11 different countries. Some of the similarities and differences encountered are discussed.

**Lecture 4: Conducting a Culture-Audit of Software before Translation (15 minutes)**
This lecture describes a project to audit the graphics, icons, terminology and concepts of software being localized from English to Arabic for Saudi Arabia, and the results of the audit.

**Lecture 5: Analyzing the Counry Cultures of International Software Development Teams (15 minutes)**
This lecture describes a project that analyzed the cultures of six cities in six different countries of a client's software development teams to improve collaboration, communication, and co-operation.

**Lecture 6: Mobile UI Design and Culture (15 minutes)**
This lecture focuses on recent developments of mobile products and services in China, Japan, Korea, and Taiwan. Some current trends are illustrated. Examples show the influence of different cultures on mobile products and services. The differences among Asian countries as well as differences from USA products and services are highlighted. We shall also briefly refer to a video-based ethnographic study of mobile phone users in four different countries.

**Lecture 7: Web 2.0 and Culture Differences (15 minutes)**
This lecture discusses characteristics of Web 2.0 sites and begins a discussion of differences among some Web 2.0 sites from USA, Japan, Korea, and Taiwan.

**Lecture 8: Social Networking Sites and Culture (15 minutes)**
This lecture discusses some of the similarities and difference observed among social-networking systems user-interfaces among North-American, European, and Asian services.

**Exercise 1 (30 minutes)**
Each group in the tutorial will study one of approximately eight cross-cultural textual dialogues and attempt to understand the hidden cultural messages. Then, the participants will examine the explanation of what is happening between two people and report their findings and their misconceptions to the rest of the participants. Discussion will follow depending on the findings.

**Exercise 2 (30 minutes) (Optional)**
Each group in the tutorial will study one of the cultural dimensions and analyze how this dimension might affect fundamental UI components (metaphors, mental models, navigation, interaction, and appearance). They will report to the rest of the participants on their findings. Discussion will follow depending on the findings.

**Exercise 3 (30 minutes) (Optional)**
Each group in the tutorial will be assigned one target culture and design a home screen and one or two other screens that demonstrate awareness of the impact of culture on aspects of functions and data. The Website is intended to be a medical information Website provided by the government for its citizens. Each team will report to the rest of the participants about their intentions and their results. Where possible, comparisons will be made with actual Websites from different countries. Discussion will follow on issues that arise.

**Optional Parallel Exercise 3 (30 minutes) (Optional)**
Each group will be assigned one target culture and design a home screen and one or two other screens that demonstrate awareness of the impact of culture on aspects of functions and data for a mobile device that enables users to view maps for trips. Each team will report to all participants their intentions and results. Discussion will follow on issues that arise.

# Learning Objectives and Abstract

## Learning Objectives

Participants will learn new terms and concepts to understand culture theory, models, and dimensions. One of several models of culture will be discussed (Geert Hofstede's dimensions of power distance, individualism/collectivism, masculinity/femininity, uncertainty avoidance, and long-term orientation), and how these dimensions relate to the design of user-interface components (metaphors, mental models, navigation, interaction, and appearance). In addition we shall introduce additional dimensions that must be conducted in relation to culture (persuasion, trust, intelligence, cognition). We shall examine the practice and tradeoffs of several multi-national companies' Web efforts and culture's impacts on user-interface design across several platforms, products, and services.

## Abstract

User interfaces for game, desktop, Web, mobile, and vehicle platforms reach across culturally diverse user communities, sometimes within a single country/language group, and certainly across the globe. If user interfaces are to be usable, useful, and appealing to such a wide range of users, user-interface /user-experience developers must account for cultural aspects in globalizing/localizing products and services. In this tutorial, participants will learn practical principles and techniques that are immediately useful in terms of both analysis and design tasks. They will have an opportunity to put their understanding into practice through a series of exercises, where time permits.

# Tutorial Slides, Publications, and Bibliographies

Presentation slides appear on the following pages, after which appear publication resources with bibliographies.

AM+A

Aaron Marcus and Associates, Inc., www.AMandA.com, 1

## AM+A: What We Do, How We Do It, How We Add Value

**Aaron Marcus, President**
**Aaron Marcus and Associates, Inc. (AM+A)**

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LinkedIn: http://www.linkedin.com/company/aaron-marcus-and-associates-inc-
YouTube: http://www.youtube.com/user/AMandAssociates
Twitter: http://www.twitter.com/amandaberkeley

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## Objectives

- What is AM+A like?
- How can we work together?
- What are the benefits of our collaboration?

AM+A

Aaron Marcus and Associates, Inc., www.AMandA.com, 3

## Our Company

- 28 Years of experience in user-interface and information-visualization design/analysis
- Multi-disciplinary, multi-cultural Associates
- Experienced with most platforms, user groups, and vertical markets
- Strong brand and client base: BMW, Daimler, Cisco, eBay, HP Labs, Kaiser, Microsoft, Motorola, Nokia, Oracle, Samsung, Siemens, US Federal Reserve Bank, Visa, Wells Fargo
- President and founder: Aaron Marcus

AM+A

Aaron Marcus and Associates, Inc., www.AMandA.com, 4

## Aaron Marcus, Founder, President, Principal Designer/Analyst

- First graphic designer to use computers
- Visionary, pioneer, professional, teacher, researcher, author/co-author of 6 books, 250 publications
- Award winner: NY Art Directors Club, NY Type Directors Club, ID Magazine, NCGA Industry achievement award, ICOGRADA, AIGA Fellow, CHI Academy, BFMA Lifetime Contribution Award, UPA
- Past Member, Motorola Visionary HI Board
- Past Co-Principal Investigator, DARPA research in program visualization

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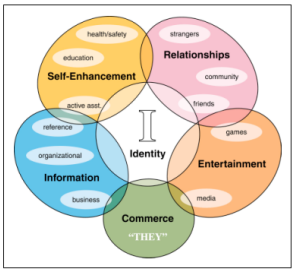
## Research: User-Experience Spaces = Opportunity Spaces




- I-ware = Me-ware, My-ware
- You-ware = Love-are
- Fun-ware
- Buy-ware = Sell-ware
- Know-ware = Who-ware, What-ware, Why-ware, Where-ware, When-ware
- Be-ware

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## Publications: Books

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## Publications: Chapters in Books


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## Publications: UX and Interactions

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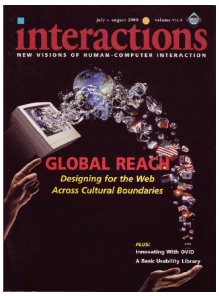


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## Our Vision and Mission

**AM+A helps people**
**make smarter decisions faster**:
anyone, any time, any place,
any technology, any market,
any subject matter

AM+A shapes the way technology affects everyday life
**through effective and compelling user-interface and information-visualization** development

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## Our Objectives

- Assist or help build centers of excellence for user-interface development
- Engage satisfied users via user-centered user-interface (UI) development that cost-effectively optimizes UIs
- Ensure usability, usefulness, and appeal in the user experience

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## UI Development Process

- **Planning:** brainstorming
- **Research:** technology, design issues, strategies
- **Analysis:** user profiles, use scenarios, prototypes
- **Design:** content, applications, branding, storyselling
- **Implementation:** scripting, coding, final production
- **Evaluation:** focus groups, user tests, heuristic evals.
- **Documentation:** guidelines, patterns, specifications
- **Training:** courseware, tutorials, mentoring
- **Maintenance:** continuing client relations

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## UI Components

- **Metaphors:** Clear concepts via words, images, sounds, music
- **Mental Models:** Easy assimilation of data, functions, tasks, and roles of people at work, play, or on the way
- **Navigation:** Efficient movement in menus, windows
- **Interaction:** Effective input/output, feedback
- **Appearance:** Quality perceptual characteristics, including visual, verbal, auditory, haptic, etc.

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## Powerful User Experience via User-Centered Development

- Focus on usability
- Attend to user experience and branding
- Attend to technology
- Consider culture/globalization issues
- Look for opportunities related to visualization and sonification
- Look for opportunities to cross-sell our services

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## Our Clients' Managers

- Managers who understand that product usability and aesthetic appeal directly impact profitability
  - Corporate product managers, marketing directors, business managers
  - Corporate software and hardware developers
  - Start-up entrepreneurs
- Managers who value design as process

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## Some Past and Current Clients

**13 of 30 Dow Jones Industrial Average™ Firms**

**Am Express**
**AT&T**
**Bank of America**
BMW
**Cisco**
Citigroup
**DuPont**
Kodak
eBay
Epson
Fujitsu
**GE**
**GM**
**Honeywell**
**HP**
**IBM**
**Intel**
J. Paul Getty Trust
Kaiser
Learning Company
Livescribe
**Microsoft**
Motorola
Nokia
Oracle
Ricoh
Sabre
Samsung
SAP
Siemens
**3M**
US Fed R Bank
Virgin America
Visa

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## Our Projects: Designing/Evaluating UIs and Information Visualizations

- Applications: mainframe, desktop, Web, mobile, vehicle, appliances
- Websites
- Prototypes and demos
- Executive presentations
- Icons, symbols, logos
- Tables, forms, charts, maps, diagrams
- Publications, documents

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## Nokia Projects

- 1996: Nokia Finland
  - Reviewed Nokia documentation for technical documentation group
  - Reviewed UI for Communicator 9000 before intro to USA
  - Tutorials in Helsinki and Oulu
- 2000: Nokia Finland
  - Reviewed Christian Lindholm's lecture at HCI UK
- 2002: Nokia Finland
  - Designed Powerpoint presentation to explain UI philosophy to third-party developers worldwide
- 2005: Nokia UK
  - Designed future UI concepts for Nokia Design Center

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## Visa USA, International, and Inovant

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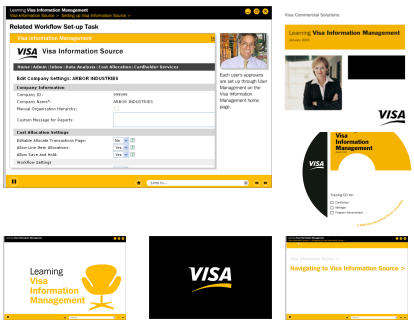
## Visa: Visa Information Source, 1/2

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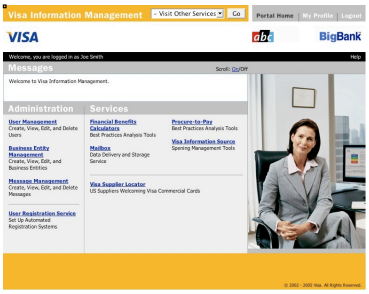
## Visa: Visa Information Source, 2/2

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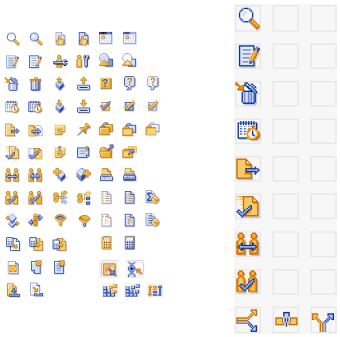
## Visa: Icons



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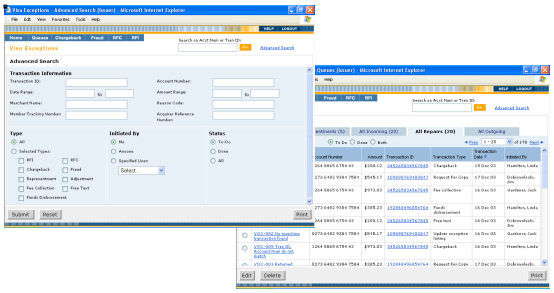
## Visa: Exceptions Reporting UI Design



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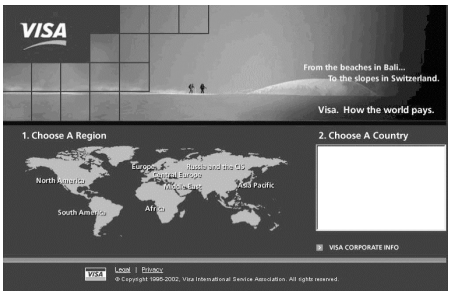
## Visa: Visa.com Global Gateway Usability Analysis and Strategy

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## Legal Case Management: Before

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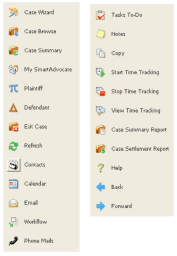
## Legal Case Management: After



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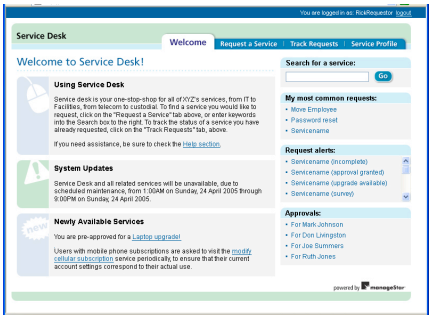
## IT Services Management Portal, 1/2

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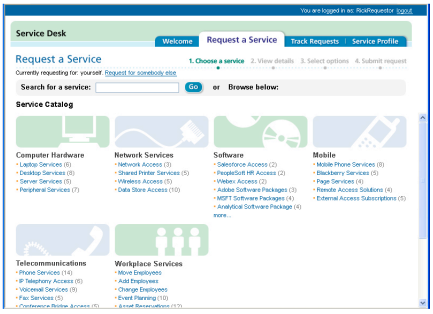
## IT Services Management Portal, 2/2

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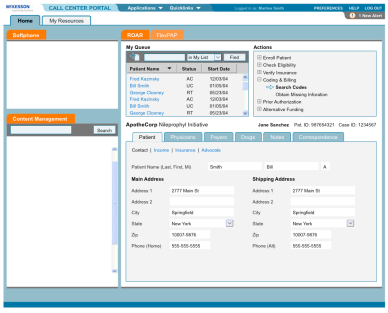
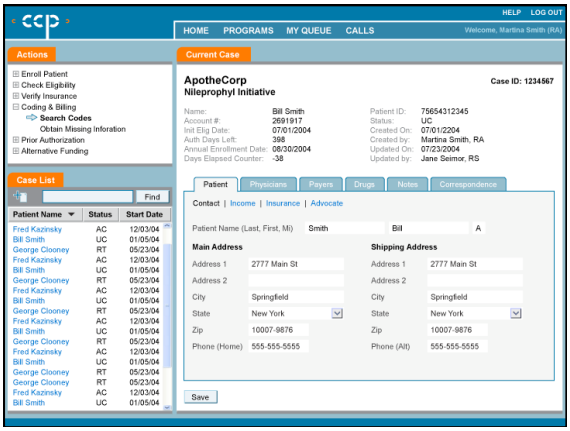
## McKesson Call Center Portal, 1/3



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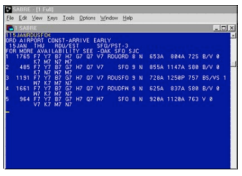
## Application Example: Sabre Travel Booking Development



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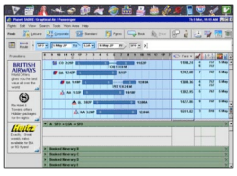

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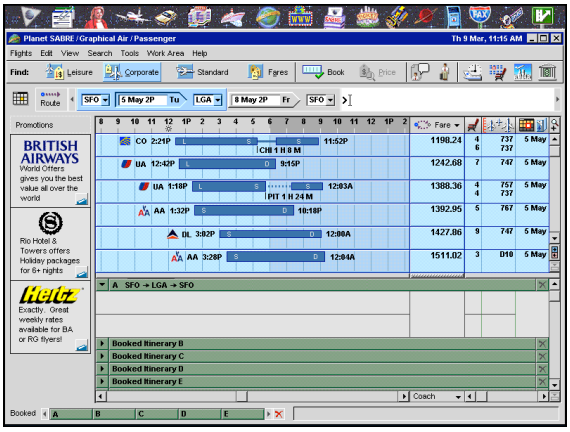
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World Offers gives you the best value all over the world
Rio Hotel & Towers offers Holiday packages for 6+ nights
Hertz
Exactly. Great weekly rates available for BA or RG flyers!
Booked Itinerary B
Booked Itinerary C
Booked Itinerary D
Booked Itinerary E


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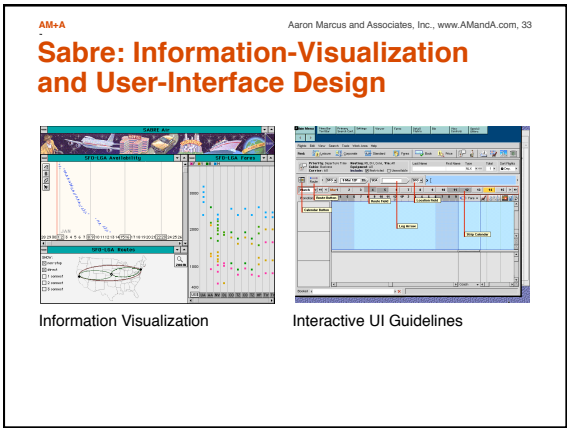
Sabre: Launch Screen Development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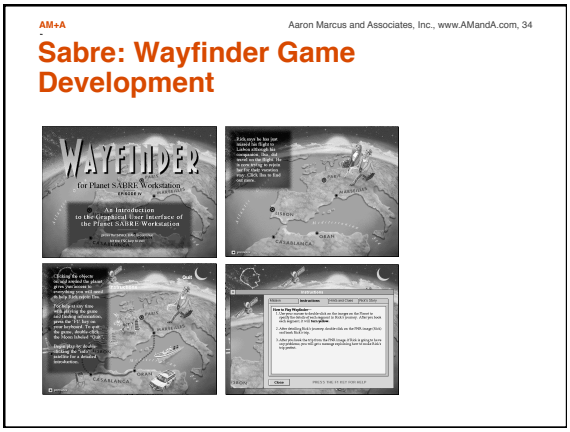
Sabre: Information-Visualization and User-Interface Design
Information Visualization
Interactive UI Guidelines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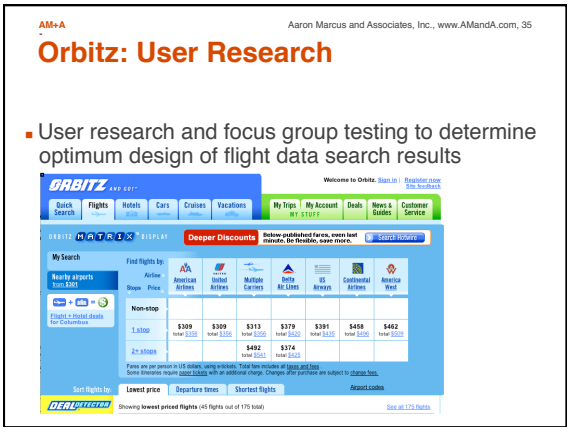
Sabre: Wayfinder Game Development
WAYFINDER
for Planet SABRE Workstation
An Introduction to the Graphical User Interface of the Planet SABRE Workstation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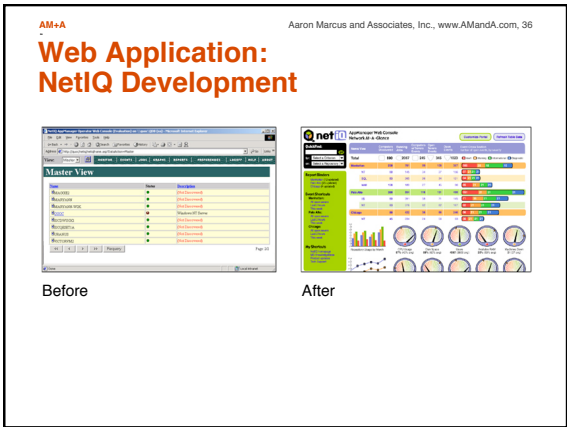
Orbitz: User Research
User research and focus group testing to determine optimum design of flight data search results
ORBITZ
Deeper Discounts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Web Application: NetIQ Development
Master View
Before
After

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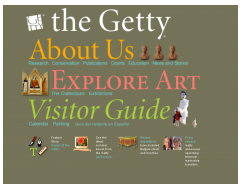
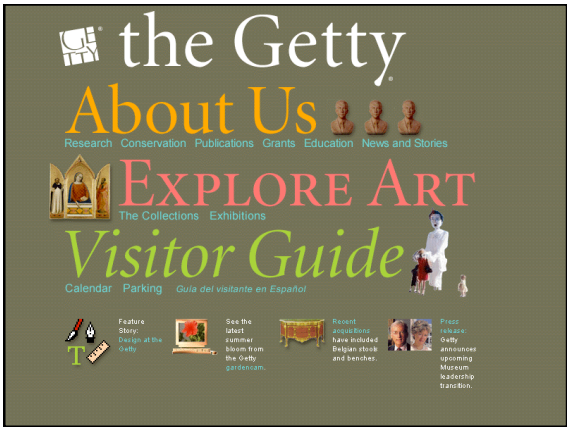
## Website: J. Paul Getty Trust Portal and Museum Website Development




Home Page


Visitor Guide Page

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## www.ThreeDegrees.com: Web-based Messaging, File-Sharing for Teens

Targeted to "Net Generation, Microsoft's first user-centered UI development, which led to a new division, now absorbed int Microsoft's latest .net offerings

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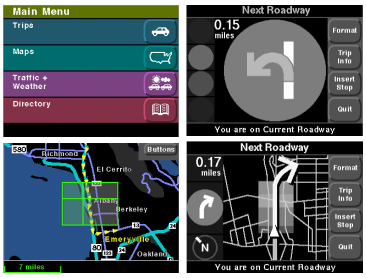
## Mobile Products: Motorola Smart-Car User-Interface Design

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## Prototype: Samsung Advanced Mobile Device Concepts


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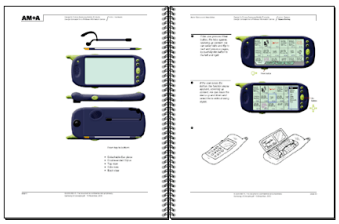
## Samsung Wireless Information Device: Design Concepts



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## Samsung Wireless Information Device: User Observation


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## Prototype: Message Manager For a Wrist-top Device

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## Microsoft Smart Watch: Prototype Channels

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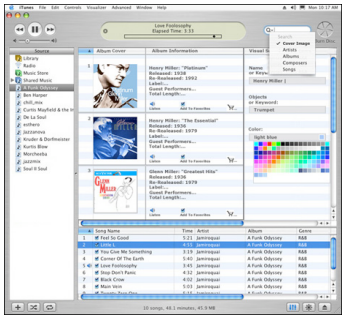
## Visual Search via Album Art



- Find music via keywords and visual perception

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## BMW: Human Factors of the Driver Experience

- Design for safety
- Avoid cognitive and sensory overload
- Reduce complexity
- Use graphical UI interface only when necessary
- Allow customization of information
- Use of physical controls
- Follow driver-centered design process

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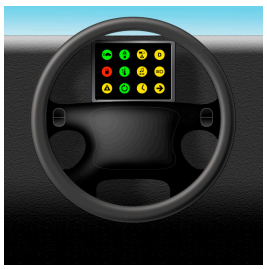
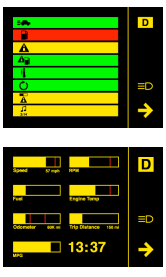
## Prototype: Vehicle Dashboard Information-Visualization





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## HP Labs: Executive Storyselling Presentations, Scenarios

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## HP Halo

- http://www.hp.com/halo


High-resolution, high-speed, broadband video meeting rooms for executive communication

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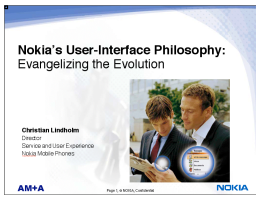
## Nokia: Marketing Presentation to Software Developers Worldwide

- Presented UI philosophy to attract and cultivate community of loyal developers, operators, and journalists

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## Anoto (LiveScribe's Smartpen): Next Gen of Leapfrog's Fly Pentop

- Fly was successful Leapfrog toy
- Tool can speak, translate, play music, record, recognize writing marks, compute, communicate

Smartpen

Fly pen

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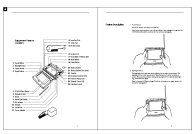
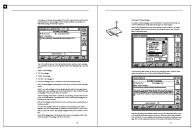
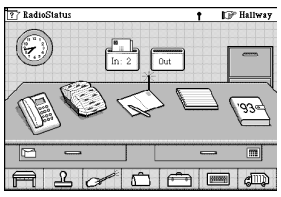
## Paper Prototypes: Motorola Personal Messenger User Manual





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## Demo/Presentation and UI design: Tradiant (GT Nexus) Shipping


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## Training Products/Services

- Cogito-Learning Media: designed and produced over 30 award-winning computer-based training products in three business lines
- Oracle Worldwide Training: designed and produced CD-ROM training products, including one AM+A wrote/illustrated about UI design; designed first-ever UI guidelines for Web-based training
- Tutorials: 1–15 days at conferences, universities, on-site at corporations worldwide, and via the Web


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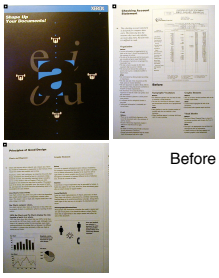
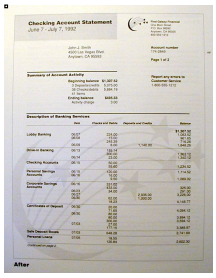
## Documentation and Training: Xerox Font Center Sales Literature



Before



After

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## Education: Tiscali European Web Portal on European Hand Gestures

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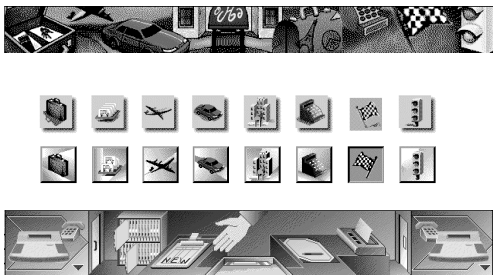
## Icon Designs, 1/3



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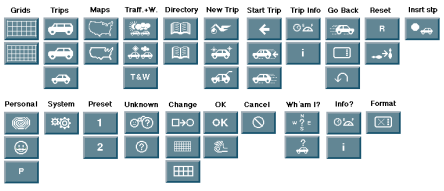
## Icon Designs, 2/3



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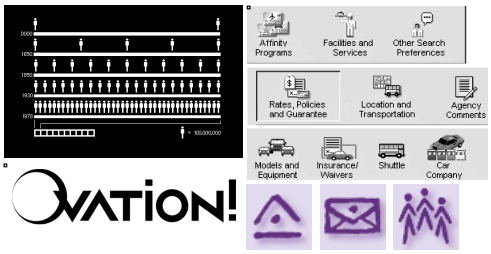
## Icon Designs, 3/3, Logo

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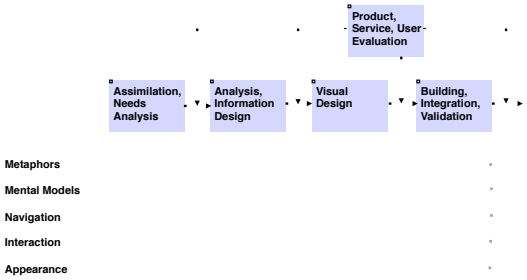
## Our Process

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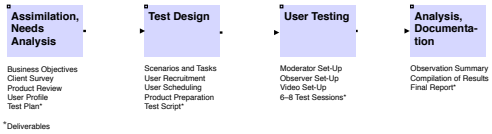
## Our Testing Process




Business Objectives
Client Survey
Product Review
User Profile
Test Plan*

Scenarios and Tasks
User Recruitment
User Scheduling
Product Preparation
Test Script*

Moderator Set-Up
Observer Set-Up
Video Set-Up
6–8 Test Sessions*

Observation Summary
Compilation of Results
Final Report*

*Deliverables

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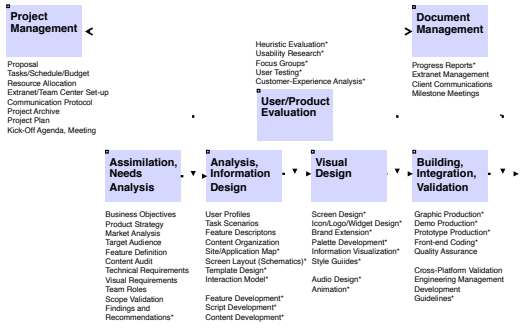
## Our Deliverables*

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## Design Process Artifacts

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## User Research

## User Models, User Profiles

**Customer Support Representative**

*"I like to talk, but I hate to write"* Susan, 27

| My Goals | My Environment | My Behaviors | Design Implications |
|---|---|---|---|
| Needs, desires or job responsibilities | Working circumstances, organization's culture or customs | Characteristics, psychographics, expectations, or usage patterns | Efficiency, learnability, or satisfaction |
| • I'm willing to contribute to Knowledge Base (KB), but want to spend as little time as possible in authoring content and get credit.<br>• Sometimes the number of documents I submit is used for performance evaluation.<br>• The manager encourages us to report document errors. | • Typically five other applications open during support<br>• I have a small monitor. | • I'm a SME for my area.<br>• I hate to write, but I don't mind writing an email.<br>• I have a writing block. I can't spend more than 10 to 30 min in writing.<br>• I hate complicated interface.<br>• 99% of times, I just extract the wisdom from a case resolution.<br>• Sometimes I start a document after a case resolution and leave a stub for later. Then I batch them up in a particular time of the day or week. | • Use email metaphor which is the most familiar to CSR.<br>• Make the user interface as simple as taking notes to remove any obstacles.<br>• Provide the My Draft link which allows a user to store, retrieve, and finish stub documents.<br>• Minimize use of pop-up windows because a user is already overloaded with many other open windows. |

User Model Example 1

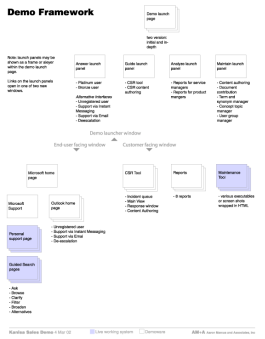




## Participatory Design

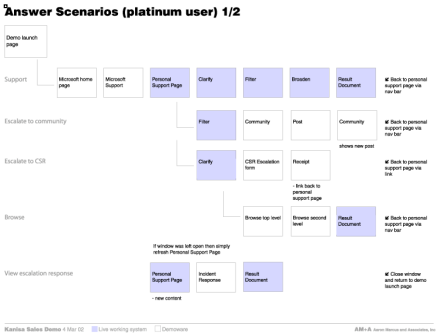



## InfoArchitecture Diagram: Framework






## InfoArchitecture Diagram: Scenarios

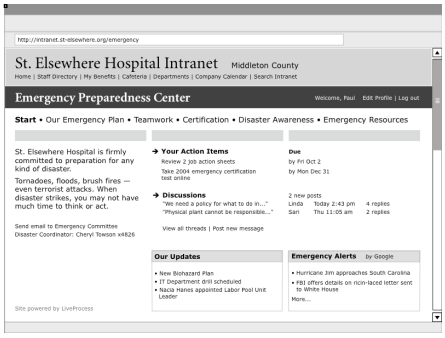





## UI Design Sketches



## Schematics



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## Visual Design Exploration


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## Visual Design: Screens, Layout, Typography, Color, Icons/Symbols


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## Visual Design: Examples


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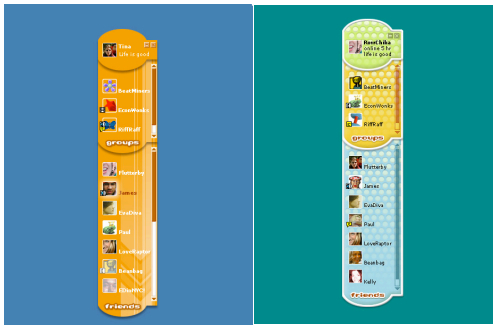
## Visual Design: Examples



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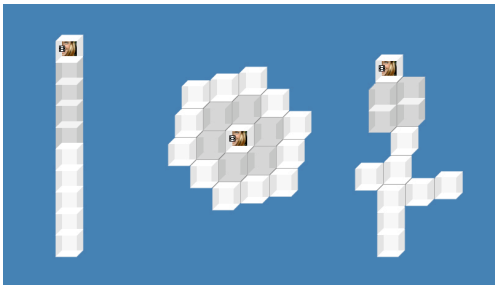
## Visual Design: Examples



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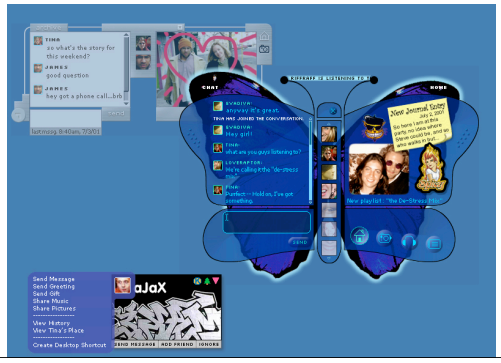
## Visual Design: Examples



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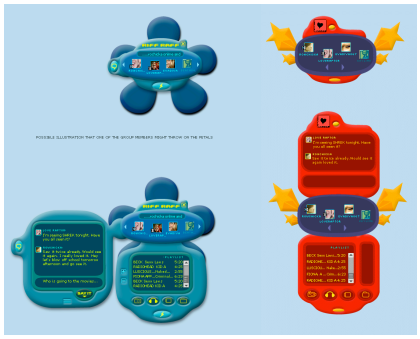
## Visual Design Examples



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## Visual Design Examples

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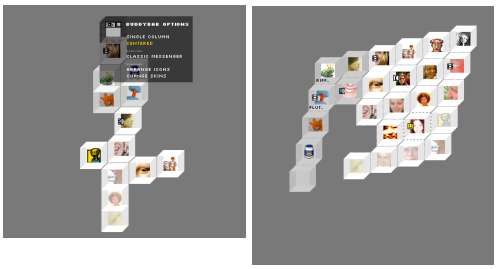
## Visual Design Examples



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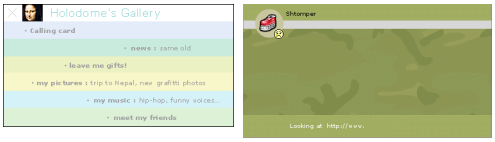
## Visual Design Examples

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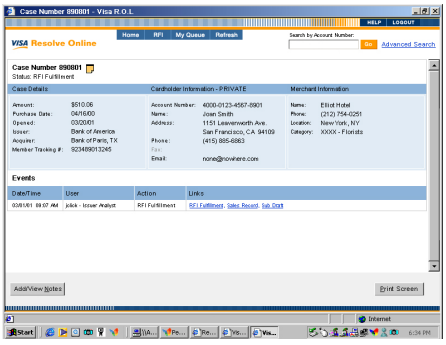
## Visual Design: Examples

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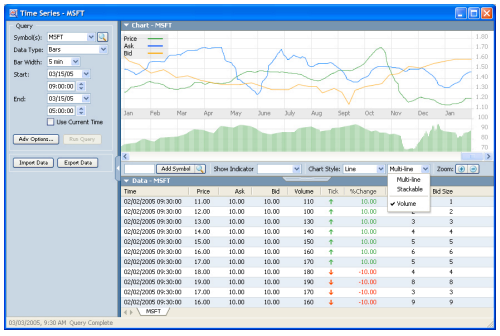
## Visual Design: Examples



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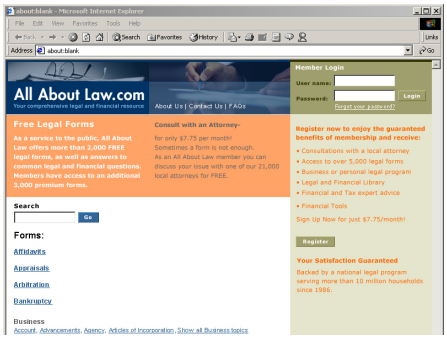
## Visual Design: Examples

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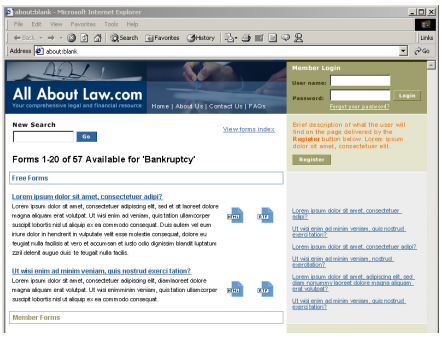
## Visual Design: Examples

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## Visual Design: Examples

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## Visual Design: Examples

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## Visual Design: Examples

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## Our Services

- User-interface and information-visualization design
- Design-strategy consulting
- Usability research, context analysis, ethnography
- Design guidelines development
- Training: UCD, UI, mobile, culture, info visualization
- Heuristic evaluations, focus groups, user testing
- User experience/brand analysis
- Improving corporate centers of excellence

## Our Value: Improving Usability, Usefulness, and Appeal

- Increase
  - Appeal
  - Sales
  - Productivity
  - Return on investment (ROI)
- Decrease
  - User errors
  - Training costs
  - Late design-change costs
  - User support costs, e.g., for call centers



## Our Advantage

- Emphasis on users
- Rigorous, thorough approach
- International, proven experience
- Flexible, focused teams
- Industry thought leader with 45 years of experience



## Let's Move Forward Together!

- What is AM+A like?
  - Smart, trustworthy, rigorous, experienced, flexible, team-oriented
- How can we work together?
  - Planning, research, analysis, design,evaluation, implementation, documentation, training
  - Improve existing centers of excellence and corporate methodology
  - Stimulate new approaches, lines of business, strategies, methods
- What are the benefits of our partnership?
  - Assist in developing your quality deliverables
  - Add to your profitability through design-strategy planning, design
  - Assist in improving your centers of excellence: process, requirements, testing, client satisfaction
  - Assist in developing your user profiles,use scenarios, prototypes, and presentations



## AM+A: What We Do, How We Do It, How We Add Value

**Aaron Marcus, President**
**Aaron Marcus and Associates, Inc. (AM+A)**

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LinkedIn: http://www.linkedin.com/company/aaron-marcus-and-associates-inc-
YouTube: http://www.youtube.com/user/AMandAssociates
Twitter: http://www.twitter.com/amandaberkeley

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## Cross-Cultural User-Experience Design: What? So What? Now What?


**Aaron Marcus, President**
Aaron Marcus and Associates, Inc. (AM+A)

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LinkedIn: http://www.linkedin.com/company/aaron-marcus-and-associates-inc-
YouTube: http://www.youtube.com/user/AMandAssociates
Twitter: http://www.twitter.com/amandaberkeley

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## Presentation Summary

- Introduction and some definitions
- Culture and user-experience (UX) design: theory and practice
- Some challenges ahead: evolution and revolution

June 25, 2005
**Bill Gates as Anthropologist**
By PAUL B. BROWN

MARGARET MEAD. Louis Leakey. Bill Gates?

Grouping the founder of Microsoft <http://www.nytimes.com/redirect/marketwatch/redirect.cfx?MW=http://custom.marketwatch.com/custom/nyt-com/html-companyprofile.asp&symb=MSFT> among great anthropologists is not as strange as it first sounds, according to the current issue of Fortune Small Business.
In an effort to grow ever closer to its customers, Microsoft has hired numerous social scientists, including anthropologists, to help it understand the natives, who in this case are the small-business owners who use its software.

The research is part of Microsoft's effort to produce its Office Small Business Accounting software, although this approach to understanding customers would seem applicable not only for other Microsoft products, but also for just about every other company that sells a product.

Microsoft's idea behind going into the field to study customers is simple, as Richard McGill Murphy writes in the article "Getting to Know You": the better you understand how your customers work, the easier it becomes to design products and services to meet their needs.

And the more you understand where the market is heading, the easier it is to get there first.

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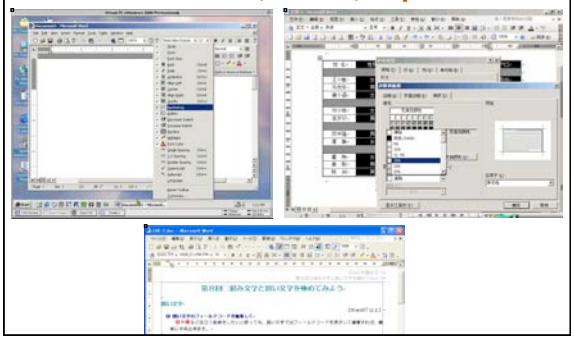
## Microsoft Applications: What's Different in USA, China, Japan?



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## Introduction

- Modern technology and commerce permit global distribution of products, services to increasingly diverse users
- Traditional user-interface (UI) design and usability disciplines: Improve performance and productivity
- User-experience (UX) design issues: Even more complex and challenging
- **Culture analysis** offers *a* way to understand, even measure, **differences** and **similarities** of **UX**

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## Some Definitions: User Interface and Information-Visualization

- User-interface components
  - **Metaphors:** Essential concepts in words, images, sounds, touch
  - **Mental Models:** Organization of data, functions, tasks, roles, of people at work or play, static or mobile
  - **Navigation:** Movement through mental models via windows, dialogue boxes, buttons, links, etc.
  - **Interaction:** Input/output techniques, feedback
  - **Appearance:** Visual, verbal, acoustic, tactile
- Information visualization/sonification
  - Representations of **structures and processes**
  - Abstract vs. representational
  - Classical: Tables, forms, **charts, maps, diagrams**
  - Innovations: Hyperbolic browser, Tree maps, Table lens

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## Some Definitions: User-Experience (UX) Design

- Enlarged scope of objectives for products/services
  - **Usability**: Efficient, effective, satisfying (ISO definition)
  - **Usefulness**: Fits the user's needs/desires well
  - **Appeal**: Delight, fun, engagement, emotions, branding
- Experience covers all stakeholder "touch-points"
  - Buyer, customer, user, learner, expert, advocate, staff, investor
- Focus on content, brand, emotions
  - Example: Apple iPod success, from zero to hero in one year
- Evaluation techniques shift
  - Ethnographic analysis, shadowing, as well as focus groups, tests
  - Underlying emotional motivations of "non-rational" customers
  - Users involved within socio-cultural context

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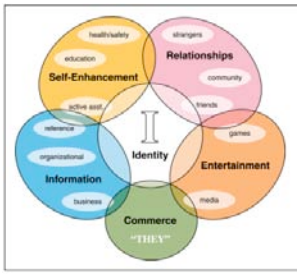
## User-Experience Spaces: Opportunity Spaces




- **I-ware** = Me-ware, My-ware
- **You-ware** = Love-ware
- **Fun-ware**
- **Buy-ware** = Sell-ware
- **Know-ware** = Who-What-Why-Where-When-ware
- **Be-ware** = Self-aware

Marcus, Aaron (2004). "Six Degrees of Separation," *User Experience*, June 2004, pp. 16

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## UX Development Process + Culture and Globalization Awareness

- **Plan:** brainstorming information sonification
- **Research:** technology, design issues, strategies
- **Analyze:** user profiles, use scenarios, prototypes
- **Design:** content, applications, brand, storyselling
- **Implement:** scripting, coding, final production
- **Evaluate:** focus groups, user tests, heuristic evals.
- **Document:** guidelines, patterns, specifications
- **Train:** courseware, tutorials, mentoring
- **Maintain:** continuing client relations

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## Culture as a Context and Technique

- Culture interested in large-scale and small-scale group behaviors (rituals), leaders/followers, values, artifacts, signs
- Many culture models exist as bases for analysis, design, evaluation
- Culture analysis related to **semiotics**/***semiologie***, the science of signs: what do things "mean"
- Culture affects every aspect of tool-, sign-making
- **Culture-centered design** seems "inevitable"

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## Culture-Centered Design

- Designers aware of culture
- "Meaning" derives both from the designer *and* what the user brings to the artifact
- In era of instant, global media, cultures are always being affected and evolving
  - Remember: Chinese culture was not always "Confucian"
  - Remember: USA golf sport imported to Japan is more like a religion
- Designers cannot escape being biased culturally
- All designed artifacts are cultural objects

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## The Web: an Example of Culture-Centered UX Design

- Immediate global communication, interaction, and UX
- Web = Cultural artifact
- Localization issues far beyond translation

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## Should every Website look like this?

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## Which Website for Saudi Arabia is Better?



"Saudi king tells newspapers to not run photos of women." [*San Francisco Chronicle*, 17 May 2006, p.A2.]

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## Arabia On.Line


Original


Revised

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 15

## Yahoo.com vs. Maktoob.com


- 165m (04): Most in world
- 4m (05): Most in Arab World

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## Examples of South Africa, India: Many Challenges, Opportunities

- Many races, ethnic groups, languages

Beckwith and Fisher, *Rituals of Africa*, Abrams, New York, 2000

[*BusinessWeek*, 5 July 2004, p. 14]

*Greg Horn, Devi*, Liquid Comics, Bangalore, 2006 Exhibit at LACMA, 1109-0210

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## International/Intercultural Issues, 1/3

- Geographic, political, linguistic
  - Example: ISO CRT-color, icon, and UI standards
  - Example: Canadian bilingual requirements
  - Example: Currency, time, physical measurements

Apple iLife Website Country/Language Switcher

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## International/Intercultural Issues, 2/3

- Religious, historical, aesthetic:
  - Calendars, "Le weekend" = Thu/Fri in some Islamic nations
  - Color/type/signs/terms

[*Wall Street Journal*, 21Jan04, p B7]

[Iraq issue = http://www.npr.org/templates/story/story.php?storyId=4540715]

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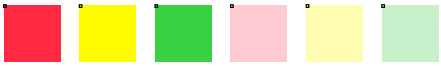
## International/Cultural Issues: Color Sets, 3/3

- Sacred Colors

- High- vs. Low-Chroma Colors



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## Example: Flag's Colors Refer to Cultures, Religions, Histories

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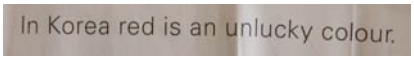
## Example: Aesthetic Differences of Dionysus/Apollo

- Cultural preferences exist for color, layout, textures, and patterns
- Europe/USA/Chinese/Japanese/Indian architecture, painting, sculpture exhibit typical preferences
- Traditional vs. popular styles:
  Japan: Highest = B+W, asymmetric balance
- Specific attitudes: Body parts, Harel, Prabhu research in China, Japan [IWIPS99 *Proc.*]

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## Localization

- Small-scale communities with preferred jargon, signs, rituals:
  - Affinity group example: USA Saturn owners
  - Social group example: Japanese housewives
  - Web group example (geo-dispersed): MP3.com
  - Not lifestyle groups: Clausen, *Faded Mosaic,* 2000
  - Resources: LISA, Hoft, Sapient.com, etc.

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## Business Challenges: How to Account for UX and Culture?

- Determine optimum characteristics: Relies on market and user data
- Assist and appeal to target markets: Achieves short-term and long-term success
- Avoid too many variations: Wastes time and money

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## Culture Theorists, Models, and Dimension

- Benedict,Ruth, *Patterns of Culture*, 1939
- Hall, Edward: Context and time
- **Hofstede, Geert: 5 dimensions for 50+ countries**
- Kluckhohn and Strodtbeck: Value orientations
- Schwartz, Shalom H.: 7 dimensions for 39 countries
- Trompenaars Fons (including Parson's Pattern Variables): *Riding the Waves of Culture*
- Victor, David: Cultural features

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## Geert Hofstede's Cultural Dimensions

- *Cultures and Organizations: Software of the Mind*, Geert Hofstede, McGraw-Hill, 1997
- Hofstede examined **IBM employees** in 50 countries, 1978–83; analyzed statistical data
- Culture: **Patterns of thinking, feeling, acting** programmed by a particular group, not "refinement of the mind," civilization
- Differences of cultural manifestations: **rituals**, **symbols**, **heroes/heroines**, **values**

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## Hofstede's 5 Dimensions of Culture

- Power-distance
- Collectivism *vs.* individualism
- Femininity *vs.* masculinity
- Uncertainty avoidance
- Long- *vs.* short-term orientation

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## Power Distance (PD)

- Extent to which less powerful members expect, accept unequal power distribution
- **High** PD countries
  - Centralized power in few hands; tall hierarchies
  - Ideal boss = benevolent autocrat, good father
  - Subordinates expected to be told what to do
- **Low** PD countries
  - Subs and Supers consider each other equals
  - Changeable roles; decentralized, flat hierarchy

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## Implications for Global UX Design: Examples for High Power Distance

- **Structured**, guided **access** to information
- **Emphasis on** larger **social/ moral order** (e.g. nationalism/ religion brought into Web context)
- **Focus on expertise** (authoritative content) **and leaders** (rather than customers/employees)
- Integrated security, unhidden "restrictions"
- **Importance of certifications**, awards, logos
- Social role used to organize information (e.g. special managers' sections)

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## Examples of PD Index (PDI) in Web

Contrasting University Websites:

- **Malaysia** (PDI rating of 104; highest in Hofstede's index)
  - www.uum.edu.my (Universiti Utara Malaysia)
- **Netherlands** (PDI = 38; 40/53)
  - www.tue.nl (Technische Universiteit Eindhoven)

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## Examples: University Home Pages

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## Examples: University Home Pages


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## Examples: Univ. Home Pages (2011)


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## Examples: Univ. Home Pages (2011)


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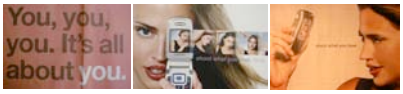
## Individualism *vs.* Collectivism

- **Individualism:** Ties between individuals loose: everyone expected to look after one's self or his/her immediate family (nuclear families)




  - **Samsung ads: appealing to egotists**
- **Collectivism:** People from birth integrated into strong, cohesive in-groups, which continue to protect them in exchange for unquestioning loyalty (extended families)

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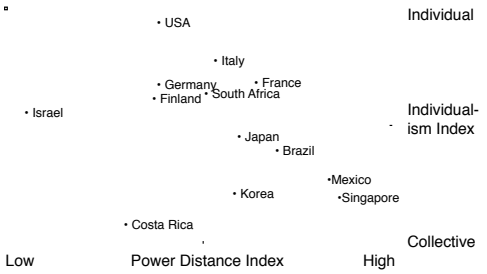
## Power Distance *vs.* Individualism-Collectivism

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## Examples of Individualism vs. Collectivism

- **Work:**
  - Individual: Personal time, freedom, challenge, external motivation, material rewards
  - Collective: Training, physical conditions, use of skills, internal motivation
- **Family:** Honesty/truth vs. harmony
  - Individual: Honesty/truth, talking, guilt, self-respect
  - Collective: Harmony, not talking, shame, losing face
- **Education**
  - Individual: Private schools
  - Collective: Public schools

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## Key Differences: Individualism vs. Collectivism

- Individualism
  - **Individual** social/economic **interests** dominate
  - **Right to privacy**; private opinions expected
  - Strong political power of voters; greater **press freedom**
  - **Ideology of freedom, self-motivation**
- Collectivism
  - **Collective** soc/econ **interests** dominate
  - **State dominates** economy, press,
  - **Consensus** = ultimate goal
  - **Ideology of equality, harmony**

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## Implications for Global UX Design

- Individualism
  - Focus on **maximizing personal achievement**
  - Materialism and **consumerism demonstrate individual success**
  - Controversial **speech** and **extreme claims** encourage "truth"
  - Images of **youth/activity,** rather than age/wisdom/"being")
- Collectivism
  - Individual roles downplayed (e.g., just product); **group focus**
  - **Preference for socially supportive** and constrained **claims**
  - **Controversy discouraged**: tends to divide people
  - **Respect for tradition** (historical focus)

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## Examples of Individualism/ Collectivism on the Web

National Parks:

- **Individualism**: **United States** (IDV = 91; highest rating)
  - www.nps.gov/glba/evc.htm (Glacier Bay National Park)
- **Collectivism**: **Costa Rica** (IDV = 15; 46/53)
  - www.tourism-costarica.com/ (National Parks of Costa Rica)

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## Examples: Website Home Pages


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## Examples: Website Home Pages


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## Examples: Website Home Pages

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## Gender: Femininity vs. Masculinity

- Traditional Gender Roles (not physical differences)
  - Men: Assertive, **competitive**, **tough**
  - Women: Home/children, **people-oriented**, **tender**
- Hofstede's Culture Definition:
  - Masculine: roles distinct; feminine: roles overlap

[*Time*, 12 Apr 04, p23; *The Hindu*, 28 Mar 04, p1]

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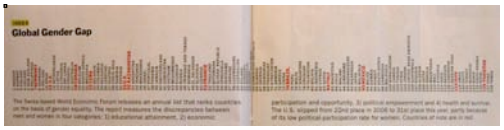
## Masculinity Index Values for Selected Countries

- 95 Japan
- 79 Austria
- 62 USA (South Africa 63)
- 53 Arab countries (inc SA)
- 47 Israel
- 43 France
- 39 South Korea
- 05 Sweden




[*Time*, 26 November 2007, pp. 8–9]

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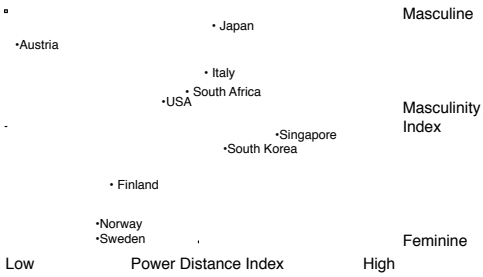
## Power Distance vs. Masculinity

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## Traditional Work Goals

- Masculine (**achievement**)
  - Earnings
  - Recognition
  - Advancement
  - Challenge
- Feminine (**relations**)
  - Manager: Good working relation with direct supervisors
  - Cooperation: Work with people who cooperate well
  - Living area: Live in desirable location for one's self and family
  - Employment security: Physically safe and be able to work for as long one wishes

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## Implications for Global UX Design

- Masculine
  - Traditional gender/ family/ age **distinctions emphasized**; work tasks/ roles given preference
  - **Mastery** most **important**; Websites designed for exploration, control
  - **Games/competitions** held grab attention
  - **Artwork** may be **utilitarian**/ instrumental
- Feminine
  - **Gender**/work **roles blurred**
  - **Mutual** exchange and **support** more important than master
  - Website task-oriented and provide quick results for limited task
  - More **emotional/aesthetic appeal**

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## Examples of Masculinity/ Femininity on the Web

Gender-oriented sites:

- **Masculinity**: **Japan** = 95 (highest MAS)
  - woman.excite.co.jp – women's site
  - www.isize.com/top – site for young adults
- **USA** = 52 (15/53)
  - www.chickclick.com
- **Femininity**: **Sweden** = 5 (lowest of 53 nations)
  - se.excite.com

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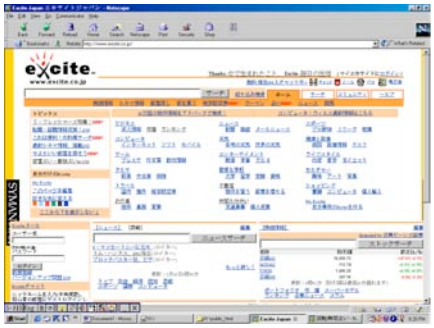
## Excite/Japan for Males, Females



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## Excite/Japan for Males, Females

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## USA and Sweden

- USA: Chickclick.com for chicks
- Sweden/Excite: no gendered sites

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## Uncertainty Avoidance

- Feeling threatened by uncertain/unknown
- Fear/risk *vs.* **anxiety**: Known *vs.* **unknown**
- Countries vary in formality, punctuality, certainty requirements
- Extreme uncertainty creates intolerable anxiety; law, religion seek to reduce it
- **Intolerance of ambiguity**

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## High *vs.* Low Uncertainty Avoidance

- High
  - People seem busy, emotional, **aggressive**, active
  - What is **different is dangerous, dangerous and dirty related**
  - Students expect **teachers** to be **experts** with all the answers
  - **Shun ambiguous situations**; prepared to engage in risky behavior to reduce ambiguities, like starting a fight, instead of waiting
- Low
  - Quiet, **easy-going**, indolent, controlled, lazy
  - What is **different is curious** (or ridiculous)
  - Students respect **plain language**, teacher who may not know all
  - Definitions of clean/dirty; safe/dangerous differ widely by country

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## Implications for Global UX Design: High UA

- High
  - Keep it **simple**
  - Reveal results/ implications of actions
  - Make attempt to prevent looping/ becoming "lost in cyberspace"
  - Use constraints/task animations/models to reduce "user error"
  - **Carefully encode meaning** through multiple redundant cues
- Low
  - **Complexity and risk** more **valued**: less protection from failure
  - **Less controlled navigation:** Links may open windows, change site
  - Help system focuses on information; task orientation secondary
  - Coding of color/ shape/ texture cues used to maximize information; **need not be** so **redundant**

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## Examples of Uncertainty Avoidance on the Web

Airline Companies:

- **Belgium** = 94 (5+6/53)
  - www.sabena.com
- **UK** = 35 (47/53)
  - www.britishairways.com

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## Examples: Airline Home Pages


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## Examples: Airline Home Pages


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## What Happens Over Time? Airline Home Pages Change…But…


Sabena


British Airways

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## Comparison of UA for 2003 Airline Websites

- **Inside** travel booking pane
  - Sabena, Belgium: 19
  - British Airways, United Kingdom: 16
- **Outside** the travel booking pane
  - Sabena, Belgium: 23
  - British Airways, United Kingdom: 43
- **Culture differences survive** design improvements!

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## Long- *vs.* Short-Term Time Orientation: Confucian Dynamism

- **Stable society** requires unequal relations
- **Family** is prototype of all social organizations
- **Virtuous behavior** to others = not treating others as one would not like to be treated
- **Virtue** re one's task in life = trying to acquire skills and education, working hard, being frugal, being patient, **persevering**
- **Practice oriented**, not belief (truth) oriented

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## Long-term orientation (LTO) Ranking for Some of 23 Countries

- 01 China
- 04 Japan
- 17 USA
- 22 Nigeria
- 23 Pakistan

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## Implications for Global UX Design: Long-Term Orientation

- **Practice** more **important** than theory
- Accomplishing the task sufficient; expertise not required
- **Personal network** provides resources for achievement (*cf.* Chinese **Guanxi** principle)

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## Examples of Long/Short-Term Time Orientation on the Web

Siemens:

- **Germany** = 31 (14/23)
  - www.siemens.com/de
- **China** = 118 (highest LTO)
  - www.siemens.com.cn

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## Examples: Germany and China

Siemens Germany

Siemens China

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## Summary: China *vs.* Germany

- **Germany**
  - Design that is appropriate just for now (will be outdated in a certain amount of time)
  - Concentration on just **showing task or product**
  - **Function**, **mastery**, organization-oriented
- **China** (Long-term time orientation):
  - Soft focus
  - **Warm, fuzzy images**
  - Timeless, classic design
  - Emphasis on **people images**

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## Cautions with Hofstede's Culture Model

- Old data, pre-post-modern (no emphasis on media, sociology of culture, politics of culture)
- Corporate subjects only
- Assumes one culture per country
- Assumes fixed, unchanging relationships
- Gender roles, definitions debatable
- Seems too general, stereotypical
- Nevertheless: use widespread

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## How to Work with Cultural Models: Examples from China and Germany

- Honold, Pia
  - "Learning How to Use a Cellular Phone: Comparison Between German and Chinese Users," *Jour.* STC, Vol. 46, No. 2, May 1999, pp. 196–205. (now Pia Quaet-Faslem)
- Lee, Ook
  - "The Role of Cultural Protocol in Media Choice in a Confucian Virtual Workplace," *IEEE Trans.Prof. Comm.*, 43:2, Jun 00, pp. 196–200.
- Choong and Salvendy
  - *Internat. J. of HCI*, 1999. Studied Chinese/USA mental models of house: thematic vs. functional/categories; better performance/memory with own model. See: Carroll, J. M., "Using Design Rational to Manage Culture-Bound Metaphors for Internat. UIs," IWIPS 99, *Proc., p 125-132.*

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## AM+A Used Hofstede to Study Web Design and Culture

- 12 corporate, global Websites
  - Long case study in Visible Language: 38:1, 2004, 64pp.
  - Short report: *Proceedings* of IWIPS 2003, 10 pp.


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## Websites Analyzed

- Used Hofstede, but could have used other models
- "Mature" company Websites with parallel content in multiple countries
- Consumer (B2C) and business-to-business (B2B) sites

| | US | EU | Asia |
|---|---|---|---|
| Business | Sapient (S) | Siemens (SIE) | Hitachi (HIT) |
| | Peoplesoft (PEO) | SAP (SAP) | |
| Consumer | McDonalds (McD) | IKEA (IKE) | Sony (SON) |
| | Coca Cola (COC) | Mercedes (MER) | Mazda (MAZ) |

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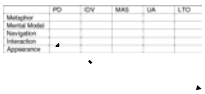
## Cross-Cultural Matrix: UI Components vs. Culture Dimensions



Hofstede Culture Dimension: Power Distance (PD)

User-Interface Component: Appearance

| | Low PD | High PD |
|---|---|---|
| **Appearance** | Images of people, groups; daily activities; popular music, symbols, typefaces, layouts, colors; informal speech | Images of leaders; national/corporate/govt themes, slogans, insignia, logos, symbols, typefaces, layouts, colors; official anthems, formal speech |

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## Example: Power Distance *vs.* Metaphors

- **Siemens Website:** Personal images vs. official buildings
- Netherlands (PD 38) Malaysia (PD 104)

Metaphor for "Home": the face / eyes of a person

Metaphor for "Home": an official building

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## Example: Power Distance *vs.* Navigation

- **Sapient Website:** amount of options provided
- Germany (PD 35) India (PD 77)

*How do I apply for a position at Sapient?Send your complete application with CV, picture and job reference to our hiring team in Düsseldorf or Munich. Furthermore you have the possibility to apply via email. Fill out the online form or send your own digital application to: Karriere@sapient.com. It does no matter, how you apply, we try hard for a quick handling and you will hear from us soon.*

Open access, multiple options

*How do I apply for a position at Sapient?Register now to set up your profile and apply for jobs right away, or search jobs now.*

Restricted access and choices, prescribed routes

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## Example: Femininity/Masculinity *vs.* Appearance

- **Mercedes Benz Website:** Use of "soft" design
- Sweden (MAS 5)


Softer edges and shapes

Germany (MAS 66)

Clear structure, no cuteness

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## Patterns Power Distance

- Patterns found
  - All countries with **no picture** on the front page have **low PD** value.
  - The eight countries with the **highest PD** value show a picture of a **male person**.

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## Patterns: Collectivism *vs.* Individualism

- Patterns found
  - The "**individualism**" of the pictures at the PeopleSoft Website **increases with** the amount of **IDV value**
  - The arrangement of the pictures of the **low IDV** countries is very **symmetrical**.
  - Among the 15 lowest rated countries regarding IDV, there are no people shown on the Siemens localized Website imagery, but one can find images of people in those countries that have a higher ID.

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Aaron Marcus and Associates, Inc., www.AMandA.com, 76

## AM+A Studied Other Models: Best-of-Breed Culture Dimensions

- Surveyed: **11 Authors in 9 Sources**
  - Adler, Nancy J.
  - Condon, John C.
  - Hall, Edward T.
  - Hofstede, Geert
  - Kluckhohn, F. R.
  - Parsons, Talcott
  - Strodtbeck, Fred
  - Trompenaars, Fons
  - Victor, David A.
  - Wright, Quincy
  - Yousef, Fathi S.
- Published survey
  - Baumgartner, Masters thesis, **http://mavas.at/val**
  - Marcus, Baumgartner, APCHI 2004 *Proceedings*, Summary

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Aaron Marcus and Associates, Inc., www.AMandA.com, 77

## 29 Dimensions in 9 Sources

- Achievement *vs.* ascription
- Activity orientation
- Affective *vs.* neutral
- Authority conception
- Context
- Degree of power
- Economic progress
- Experience of technology
- Face-saving
- Gender roles
- Human nature orientation
- Individualism *vs.*collectivism
- Instrumental *vs.* expressive
- Internal *vs.* external control
- International trade, community
- Long *vs.* short time orientation
- Meaning of life
- Non-verbal communication
- Political decentralization
- Power distance
- Property
- Resources
- Space
- Specific *vs.* diffuse
- Technological development
- Time orientation
- Time perception
- Uncertainty avoidance
- Universalism *vs.*particularism

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## Best-of-Breed Dimensions Based on Surveying 57 experts

- Context
- Technological development
- Uncertainty avoidance
- Time perception
- Authority conception

- All others ranked, for use when time, money, circumstances permit further analysis

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## UI Usability + Culture: Is "Usability" Itself Culture-Biased?

- "Usability" may not have same attributes worldwide
  - "Non-Universal Usability? A Survey of How Usability Is Understood by Chinese and Danish Users," Frandsen-Thorlacius, *et al.*, CHI 09 *Proc*, pp. 41–58. (limited study, noting possible objections)
- Impact on Usability Practice (per paper)
  - May affect usability testing and user-centered design
  - Findings on perceived usability not transferable across all cultures
  - For international usability work assume universalism cautiously
  - Authors skeptical about using/comparing results from standardized satisfaction questionnaires across different cultural backgrounds
  - Tests must account for potential differences in perception of usability
  - Give priority to different aspects of usability to develop systems to be perceived as usable by users with different cultural backgrounds

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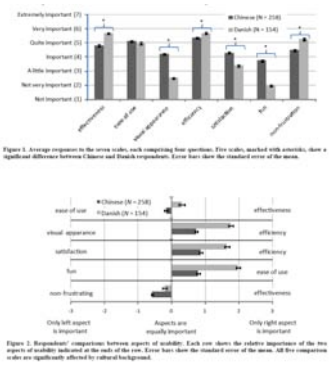
## Usability and Culture: China *vs.* Denmark

["Non-Universal Usability? A Survey of How Usability Is Understood by Chinese and Danish Users," Frandsen-Thorlacius, *et al.*, CHI 09 *Proceedings*, pp. 41–58]



AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 81

## Proving Culture Differences

- Using Eye-Tracking of Website Designs
  - Dong, Ying, "A Cross-Cultural Comparative Study on Users' Perception of the Webpage: With the Focus on Cognitive Style of Chinese, Korean, and American" Masters Thesis, Korea Advanced Institute of Science and Technology, 2007
- Studies track differences between US (analytic) viewers who stop at "monuments" before "diving" and Asian viewers who "survey" the page before diving

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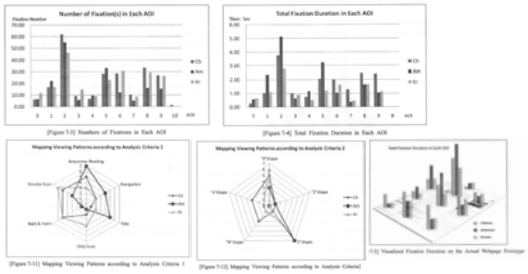
## China, Korea, and US Differences of Web-Page Viewing



[Dong, Ying, "A Cross-Cultural Comparative Study on Users' Perception of the Webpage: With the Focus on Cognitive Style of Chinese, Korean, and American" Masters Thesis, Korea Advanced Institute of Science and Technology, 2007.]

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## Where do We Go from Here in Thinking about Cultural UX?

- Alternate models: Redo studies using them
- Rethink **development steps**, *e.g.*, evaluation
- Rethink **UI components**, *e.g.*, metaphors
  - New approaches proposed for **China, India**
- Rethink platforms, *e.g.*, mobile devices
  - Sony-Ericsson Wukong with **Guanxi**; new Chinese metaphors
- Consider **additional sources of insight**
- **Educate** corporations/professions/users re culture
  - UN Bookstore: no books on culture models, only tourist interest
  - Many studies, theories, books do not include culture

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## Increasing Presence of "Culture," Anthro/Ethnography in UI/UX Design

- CHI 2009–11: Many culture-oriented sessions, plus many more papers, posters, abstracts-
- UPA 2009–11: Increasing number of sessions
- HCII 2009, 11, DUXU11: Eight sessions in 2009, plus many more papers, posters, abstracts
- AIGA, XC Design Center: Exhibits, publications, blog
- At AnthroDesign, Google, Yahoo, Facebook, and other discussion forums: Informed, passionate debate
- IWIPS 1999- : Always sessions, papers on culture

## Culture in Business: New Activities in Decade of Change, 1/2

- More articles and books in recent years
  - House, *et al* (2005). "Cross-Cultural Research on Organizational Leadership"
  - Livermore, David (2010). *Leading with Culture Intelligence*
  - Jacques, Martin (2010). *When China Rules the World*
  - McCracken,Grant (2010). *Chief Culture Officer: How to Create a Living, Breathing Corporation*
- More studies undertaken by product/service developers
  - Culture audits of software prior to translation into languages/cultures
  - Culture research of one's own corporation to learn lessons of communication, sharing, cooperation, team building, networking
  - Culture research of one's customers/markets to learn lessons of product/service innovation, absorption, appeal



## Culture in Business: New Activities in Decade of Change, 2/2

- Examples: Avoiding cultural gaffes
  - Business meeting mistakes: "Russian culture fosters smiling in private settings and seriousness in business settings."
  - One driving training company expanded into 20 countries before realizing product's culture flaws, then spent $1m to correct them
  - [Malby, Emily (2010). "Expanding Abroad?Avoid Cultural Gaffes." *Wall Street Journal*, 19 January 2010, p. B5.]
- Need for new thinking about leadership, teamwork, cooperation, sharing, privacy, innovation
  - Can not take for granted that multi-disciplinary teams members think and act alike, even with corporate culture policies and slogans
- Need for Chief Culture Officer, culture leadership
  - Who will support CCO? Engineering, business, marketing, HR?



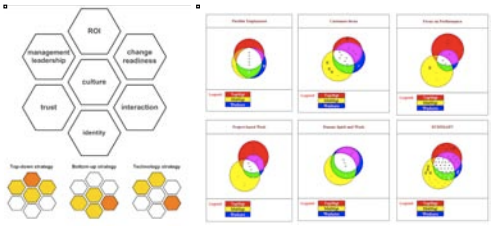
## Culture in Business: New Approaches to Research/Evaluation

- Eye-tracking studies to discover culture differences
  - KAIST research in Korea
- Varying techniques to relate to participant's culture
  - Individual vs. collective interview
  - Test-Lab vs. on-the-street interview and ethnography
  - Storytelling vs interrogation
- Cross-cultural heuristic evaluation guidelines
  - AM+A has begun, but not finished one
- New resources/references for global research
  - Schumacher, R., Ed. (2008). *Handbook of Global User Research.*
  - Stephanidis, C., Ed. (2009). *Universal Access Handbook.*



## Country Culture *vs.* Corporate Culture

- How does country culture corporate culture, especially for global, international firms?




[Images: http://farm4.static.flickr.com/3222/3049140640_f7c68be652.jpg, http://winnersatwork.com.au/images/diagrams/VenniDiagramRepresentations.gif]



## Culture in Business: New Approaches to Corporate Culture

- Are corporate cultures truly global? TBD.
- Consider Cisco example: Are there biases?
  - Collaboration Teamwork
  - Continuous Improvement/ Stretch Goals
  - Customer Success
  - Drive Change
  - Empowerment
  - Fun
  - Giving Back/ Trust/ Fairness/ Integrity
  - Inclusion
  - Innovation
  - Market Transitions
  - No Technology Religion
  - Open Communication
  - Profit Contribution (Frugality)
  - Quality Team



## Culture in Business: How Does Culture affect Development Teams?

- How does culture affect collaboration, communication, cooperation, sharing, delivery?
- How do teams work together?
  - India: Teams often work together start to finish, mentor newbies
  - USA: Individual groups work on pieces, then assemble the whole
- What is leadership like?
  - Japan: Strong boss, even with consensus (ringi) model
  - Netherlands: More democratic, lower power distance
  - US vs EU models

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## Culture in Business: New Contexts Require new Approaches

- Next decade will be more sensitive to culture in all people-centered development process:
  - Planning, research, analysis, design, evaluation, documentation, implementation, training
  - All stakeholders: engineering, marketing, business, employees, investors
  - All markets for products/services, not just "exotic" cultures
- Culture issues cannot/should not be secondary

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## UX Evaluation and Culture: How does Culture affect…

- User profiles (personas) and scenarios?
  - Culturally appropriate people, tasks, stories
- Testing, questionnaires?
  - Culturally appropriate people, tasks, test environments, questions, techniques
- Video monitoring and ethnographies?
  - Culturally appropriate persons, inquiries, behaviors, environments
- Measurement of objective and subjective "facts"
  - Culturally appropriate collection, emotional reactions
- What about Web 2.0? Social network sites?

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## Challenges to the Classic Culture Models

- **Ethnographic** approaches
  - Local groups, behaviors, "situated practice," action-oriented
- **Post-modernism**, media studies, **sociology of culture**, production of culture, **politics of culture**
  - Critique of sociological phenomena, *e.g.*, power, inequality, social construction of technology, other patterns of social organization
  - Michèle Lamont, Princeton Univ., contemp. sociological theory: http://www.princeton.edu/~sociolog/grad/courses/fall1995/soc502.html. **Towns in two countries more similar than town to city in each country or two cities to each other.**
  - David Brain, New College, Florida, sociology of culture course: http://www.ncf.edu/brain/courses/culture/culture_syl05.htm

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## Additional Sources of Insight into UX and Culture

- Persuasion
- Trust
- Intelligence
- Personality
- Cognition

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## Cultural UX Issues to Consider: What do You Think?, 1/5

- Are basics of **usability culture-biased**? Efficiency, productivity, simplicity, usefulness...for what?
- How can **culture models** be **added** to theories of utility, sociability, community, entertainment, design?
- How **map UI components** to culture dimensions?
- How can **corporations and organizations** include more **cultural theory** in development process?

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## Cultural UX Issues to Consider: What Do You Think? 2/5

- How does **culture affect Web 2.0, social network, and blog-related** products/services?


How Netlog Leaps Language Barriers

Social Networks Go Global

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## Culture UX Issues to Consider: What do You Think? 3/5

- Online training: **Friend/guru**? Tradition/skills?


- **Virtual Web Boyfriends/Girlfriends** OK?
  - WebKare.jp: Users choose animated characters who tell you how great you look, per Lisa Katayama, Tokyo Mango blog report [Kane, Yukari Iwatani, *WSJ*, 2 June 2009, p. Digital-2]

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## Cultural UX Issues to Consider: What do You Think?, 4/5

- **Interaction styles**: informal vs. formal, harmony vs. honesty, sincerity *vs.* scheming?
- **Conflict**: Frequent *vs.* seldom? Chatroom flaming OK? Clashing opinions OK?
- Would you send your **virtual representatives** on vacation (see Korea)?


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## Cultural UX Issues to Consider: What do You Think?, 5/5

- What attitudes toward **advertising** or **privacy**? Personal Webcams OK?
- Different **men, women sites/apps**?
- **Management training** biased to individualism?
- SMS messages impolite? (e.g., India, China)


[*Bangalore Times*, 30 Mar 04, p1]

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## Your Actions will make the Future: Evolution *or* Revolution

- Computer-mediated communication and interaction occurs in a **culture context**
- UX development must account for culture
- Models, methods exist; many research issues
- Design professionals cannot ignore the issues
- Future development of **tools, templates**, treasure chests of **patterns**, **body of knowledge**

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## Body of Knowledge: Resources

- ACM/SIGCHI: chi-intercultural@acm.org, www.HCIBib.org//SIGCHI/Intercultural
- AIGA/Center for Cross-Cultural Design: http://www.xcd.aiga.org
- American Anthropological Association's Internet Resources: http://www.aaanet.org/resinet.htm
- AM+A URL and publication list

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## Cross-Cultural User-Experience Design: What? So What? Now What?


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# How to Work with Cultural Models: Examples from China and Germany

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## Overview

- Mobile phone study: Objects and methods
- Assumptions about cultural models in Germany and China
- Empirical results
- Lessons learned



## Cultural Models: An Overview

- Geert Hofstede:
  - Individualism/ Collectivism
  - Power Distance
  - Uncertainty Avoidance
  - Masculinity/Femininity
  - Confucian Dimension *
- David A. Victor:
  - Language
  - Environment and Technology
  - Social Organization
  - Contextualizing
  - Authority Conception
  - Nonverbal Behavior
  - Temporal Conception



## Cultural Models: An Overview

- Edward Hall:
  - High Context/ Low Context
  - Fast Message/ Slow Message
  - Monochronic/ Polychronic
  - Sense of Space
- Fons Trompenaars:
  - Universalism/ Particularism
  - Individualism/ Collectivism
  - Neutral/ Emotional
  - Specific/ Diffuse
  - Achievement/ Ascription
  - Attitudes to time
  - Attitudes to the environment



## Practical Examples: The Use of Mobile Phones in Germany (Munich) and China (Shanghai), 1/2



## Practical Examples: The Use of Mobile Phones in Germany (Munich) and China (Shanghai), 2/2

- Objectives
  - Finding out more about the way, people use a mobile phone in different cultures
  - Finding out, how people learn to use a mobile phone
- Methods
  - Focus Groups (4 groups with 5-7 persons in each country)
  - Usability Testing (12 test persons in each country)

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## Assumptions about cultural models in Germany and China

- Objective of learning
- Traditions of learning
- Information gathering strategies
- Learning material

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## Objective of Learning

**China: Pragmatism**

"Master only the directly useful features. Improve learning time/ efficiency ratio"

**Germany: Idealism**

"Master all relevant or maybe relevant features. Enlarge possibilities of usage"

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## Traditions of Learning

**China: Rote Learning**

"Knowing by heart"

"Learning by imitating"

**Germany: Understanding**

"Knowing the principles"

"Learning by exploring"

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## Information Gathering Strategies

**China: Collectivism**

"Gather information by a network of relationships"

**Germany: Individualism**

"Gather information by formal information source (books, timetables, etc.)"

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## Learning Material

**China: Pictorial Orientation**

"Pictures are important, because Chinese is a pictorial language"

**Germany: Text Orientation**

"Trust in the written word"

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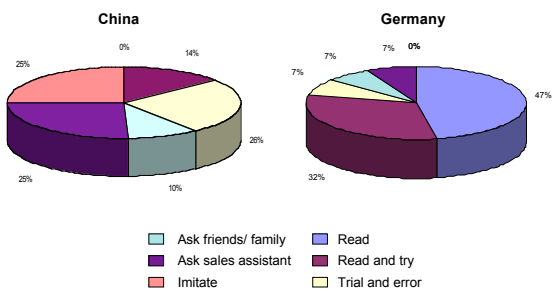
## Empirical Results



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## Objective of Learning

| China: Pragmatism | Germany: Idealism |
|---|---|
| "Master only the directly useful features. Improve learning time/ efficiency ratio" | "Master all relevant or maybe relevant features. Enlarge possibilities of usage" |

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## Traditions of Learning

| China: Rote Learning | Germany: Understanding |
|---|---|
| ~~"Knowing by heart"~~ | "Knowing the principles" |
| "Learning by imitating" | "Learning by exploring" |

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## Information Gathering Strategies

| China: Collectivism | Germany: Individualism |
|---|---|
| "Gather information by a network of relationships..." | "Gather information by formal information source (books, timetables, etc.)" |
| But think of face saving!! | |

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## Learning Material

| China: Pictorial Orientation | Germany: Text Orientation |
|---|---|
| "Pictures are important, because Chinese is a pictorial language" | "Trust in the written word" |
| Pictures are necessary to create context | |

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## Suggestions for Informing Strategies

| | |
|---|---|
| Improve sales material and training for sales persons.<br>Animated instructions on CD-ROM are well accepted.<br>Online Help must be available, because it often substitutes for user manuals | "Traditional" user manual is still the main information source. |

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## Suggestions for Informing Strategies

| | |
|---|---|
| Start with "Step by Step" information about basic functions.<br>Stress pictorial information about procedures.<br>Size of characters should correlated with importance of information. | Start with a clear overview of all possible functions<br>Stress pictorial information which gives an overview<br>Provide a detailed index. |

## Lessons Learned

- Cultural models help to focus on potentially culturally different user habits and requirements
- Cultural models must be made more concrete regarding the questions one wants to answer
- Cultural models are very context sensitive

The influence of cultural models on user requirements must be "tested" empirically!



## How to Work with Cultural Models: Examples from China and Germany

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[Honold, Pia (1999). "Learning How to Use a Cellular Phone: Comparison Between German and Chinese Users," *Jour.* STC, Vol. 46, No. 2, May 1999, pp. 196-205]

## Testing Impact of Culture Dimensions on HCI/UI Design

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[Marcus, Aaron, and Alexander, Chava, "Cultural Dimensions and their Impact on HCI Design," *Proc.*, HCII 2009, Beijing, China]



## Test Objectives

Which dimensions seemed to have strongest impact on affecting particular ethnic groups?

What considerations about culture must developers take into account when designing Websites for specific cultures/countries?

Test involved Website viewed by users from many countries

(Note: Client requested no identification)



## Best-of-Breed Culture Dimensions

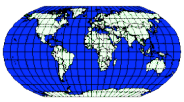
Context

Technology

Uncertainty Avoidance

Time Perception

Authority Conception





## Test Method: Developed Questionnaire with 3-Part Inquiry

Part 1: Demographic attributes

Part 2: Functionality and usability

Part 3: User experience, appeal, preferences



## Research Questions

How would you describe imagery of site, in your personal opinion?

Would Website appeal to people in your country?

What content is missing?

What features would you like to see included?



## Participants

Age Range of 20-50

All Residing in the San Francisco Bay Area
None have lived in the USA for more than 5 years

Countries of Origin Included:

| | | |
|---|---|---|
| Argentina | Italy | Russia |
| Canada | Mexico | Slovakia |
| France | Netherlands | United Kingdom |
| Germany | Poland | |

## Home Page for Testing


(Screen simulation, with some areas blocked out for confidentiality reasons)



## Some Results

Client requirement of confidentiality prevents showing actual screens



## When Designing Websites, Keep User in Mind, 1/3

Germans participants preferred a site that was more subdued and easy to navigate




## When Designing Websites, Keep User in Mind, 2/3

Mexicans preferred more colorful Website and tolerated more ambiguity




## When Designing Websites, Keep User in Mind, 3/3

Differences could be significant




## Imagery preferences

- Image of sports person was not culturally acceptable
- Canadians would have preferred ice fisherman
- Mexicans would have preferred soccer player

## Acceptable Amount of Text and White Space Varied

(Client references obscured)



## Preferences for Acceptable Amounts of White Space

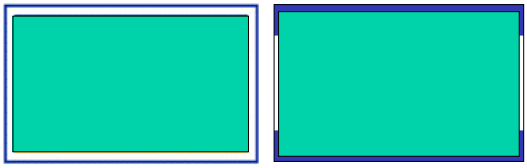
More white space
- Argentina
- France
- Mexico
- Russia
- Slovakia
- United Kingdom

Less white space
- Canada
- Germany
- Netherlands
- Poland



## Image and an Explicit Meaning

High level of uncertainty avoidance
- Requires explicit relationship between image and purpose
- Keep images close to what user expects
- (Images not shown for Client non-disclosure reasons)





## Environment and Technology

Technological skills of user must be taken into account



## Long-term vs. Short-term Time Orientation and Images

Germans preferred text, or images based from text




## Long-term vs. Short-term Time Orientation and Images

Japanese prefer images in place of text

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## Long-term vs. short-term time orientation and images

Differences can be significant


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## Animation and Navigation of Website: Canada

Participants from Canada did not prefer Flash, simpler navigation acceptable


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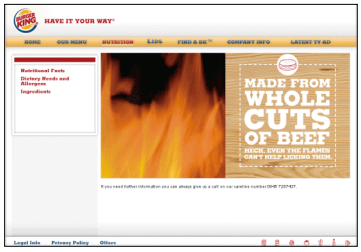
## Animation and Navigation of Website: UK

Participants from UK preferred Flash (e.g., moving flames and graphics) and more navigation options

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## Conclusion: Culture Seen as Impacting Key Design Attributes

Images (explicit *vs.* looser, more thematic)

Layout (simple, empty *vs.* full, complex)

Color ("lavish" *vs.* "tame")

Navigation (simple *vs.* complex)


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## Take-Aways

Differences are testable and in some cases may be significantly different

Designers need to be informed and remain aware of culture differences to avoid making assumptions that affect the resultant design negatively

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## Testing Impact of Culture Dimensions on HCI/UI Design

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[Marcus, Aaron, and Alexander, Chava, "Cultural Dimensions and their Impact on HCI Design," *Proc.*, HCII 2009, Beijing, China]

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## Culture: Centered Design: Culture Audit of Screen Designs for Arabic Software

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[Based on Marcus, Gould, and Wigham (2011). ""Culture-Centered Design: Culture Audit of Screen Design for Educational Software in Saudi Arabia." *Proc.*, HCII 2011, Orlando, Fl, July 2011]

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## Presentation Summary

- 1. Introduction
- 2. Cultural analysis: Education, cultural values
- 3. Visual analysis
  - Examples
  - Examples
  - Microsoft Office baseline
  - Icon usage
  - Visual themes and backgrounds
  - Text size
  - Dual language pages
- 4. Conclusions

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## 1. Introduction

- Client X, software translation/localization firm asked AM+A to conduct culture evaluation of their Client Y's educational software (library management) for Saudi Arabia
- Original focus on visual design, icons, graphics
- AM+A conducted culture audit of icons, graphics, terminology, concepts, with assistance of Saudi representatives

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## Culture Analysis, 1/2: Education Context

- Challenges: Central government influences software adoption, training
  - $32.6b (25% of total) budget for 1500 new schools, 2000 renovations
  - Emphasis on higher ed, men *and women*, diversification, employment
- Barriers to progress in using technology
  - Weak infrastructure, especially communication
  - Need for tech specialists, teachers/admins with tech knowledge
  - English language barrier; high cost of technology
- Limited progress
  - 5,300 Computer labs in primary/second schools (but 28K schools)
  - Boys, girls educated separately, unequally; new women's schools
  - 2014: plans for integrated solutions, 30K more teachers

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## Culture Analysis, 2/2: Culture Values

- Hofstede (1997): Useful as a start
  - Limited sampling (Western IBM staff), combined Arab countries
  - Hi power distance(respect for authority), med collectivism/masculinity
  - Saudi Arabia: very hi power distance, srong collectivism/masculinity
- Culture values influence educational system
  - Power distance: central, standardized, Islamic government-based education, 8–9h/w relig ed in primary and secondary schools
  - Moral values make censorship/surveillance OK: BlackBerry monitored, women limited in buying CDs/DVDs, Internet censored, porn distribution get 5y jail terms
  - Collectivism: strong nation/religious goals, *ummah concept* central, social conservatism
  - Masculinity: Gender segregation in professions, children educated separately, women covered after they become teenagers

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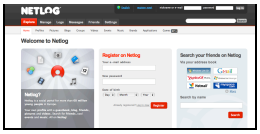
## Visual Analysis: Sophisticated, Attractive Websites, Per Saudi Opinion

- Saudi students considered these had good design
  - Saudi Arabian Airlines, King Saud Univ: Images used as buttons

## Visual Analysis: Popular Websites, Per Younger Saudis

- Simple appearance, limited colors
  - NETLOG is Euro equivalent to Facebook with many languages,
  - Kammelna.com offers card games
  - Hihi2 offers sports

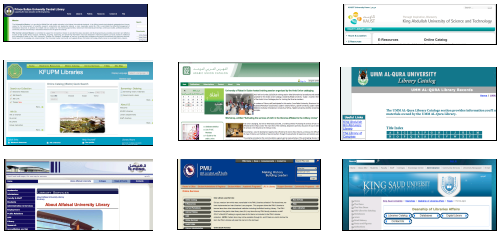






## Visual Analysis: Colors on Saudi College and University Library Websites

- Most use blue, green, gray
  - Green associated with Islam but acceptable for secular Websites





## Visual Analysis: Microsoft Office Baseline

- MS Office used throughout secondary education
  - Thus, MS Office products seem standard, best, icons can be used as basis for concepts, appearance
  - Translated MS products preferred, ability to switch languages enjoyed, may change in future as educ standads, local sw grows
  - Examples of MS Excel and Powerpoint:



## Visual Analysis: Icons, General Issues

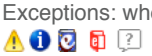
- Most buttons, tabs use text only, little use of icons
  - No cultural objection; may result from calligraphic tradition
  - Photographs widely used, including buttons
  - When both Arabic and English versions available, both use icons
  - Example of text-only in King Saud University:




## Visual Analysis: Icons with Specific Cultural, Linguistic Problems

- Avoid use of Roman alphabet or numbers:


- Exceptions: when sign is widely used:



- Avoid icons for other religions, witchcraft


- Avoid hand gestures
  - Social-networking thumbs up/down OK for young, not older Saudis
- Avoid gendered icons, immodest clothing for women



## Visual Analysis: Visual Imagery, Themes, Backgrounds

- People customize mobile phones and desktop backgrounds with photos
  - Preferred: soccer heroes, beaches, pleasant views, Angelina Jolie (!)
- Use of personal photos in social media problematic
  - Recent course case: possible damage to woman's reputation from Facebook photo
- Most images on Saudi Websites: men in authority or views of modern building reinforcing national pride

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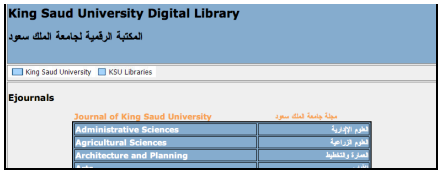
## Visual Analysis: Text Size on Buttons

- English *vs.* Arabic: 25%+ larger, if type size same
- User testing may be needed to keep buttons, labels, and text legible, readable
- Table shows issues: *http://digital.library.ksu.edu.sa*

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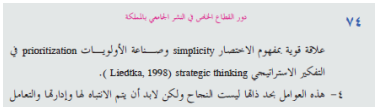
## Visual Analysis: Dual Language Pages

- Some Arabic library sites designed so page can show English on left, Arabic on right
  - Good for bilingual users who switch when searching bilingual texts
- Example of bidirectional input
  - R to L English words, names within L to R Arabic text
  - Users switch directions using standardized key combinations

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## Audit Conclusions: For Client X's Software Localization for Client Y, 1/2

- Translation was appropriate first step of localization
- To minimize further expense, basic visual layout and colors could be used with only minor changes
- For Middle-East market, product required cleaner look with more blues, more abstract, simplified icons

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## Audit Conclusions: For Client X's Software Localization for Client Y, 2/2

- Two levels of acceptance: end users and conservative government/religious institutions who must approve products for use in schools
- To pass initial review, UI for library admin may need to accommodate Saudi concern re info access
  - Saudi Ministry of Education restricts many types of books
- Now is unique, exciting, challenging time for US company to engage in process of educational change as system changes, opportunities for men/women change, modernity emerges (not only in Saudi Arabia)

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## Culture: Centered Design: Culture Audit of Screen Designs for Arabic Software

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[Based on Marcus, Gould, and Wigham (2011). ""Culture-Centered Design: Culture Audit of Screen Design for Educational Software in Saudi Arabia." *Proc.*, HCII 2011, Orlando, Fl, July 2011]

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## Analysis of Country Cultures to Improve Teamwork in Development Teams

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[Based on Gould, and Marcus ((2011). ""Company Culture Audit to Improve Development Team's Collaboration, Communication, and Cooperation" *Proc.*, HCII 2011, Orlando, Fl, July 2011]

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## Presentation Summary

- 1. Introduction
- 2. Recommendations
- 3. Analytical Criteria
  - Traditional Measures of Culture
  - Criteria: Tech Innovation and Globalization
  - Criteria: Equal Employment and Gender Ratio
  - Additional Considerations: Corp Culture and HQ Effect
- 4. Conclusions

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## Introduction

- California Client X asked AM+A to recommend 4 sites from 15 countries in 6 work regions for company-wide collaboration study
- Objectives: Greatest diversity re headquarters site, greatest opportunity for colaboration innovation
- Two sets of criteria initially
  - Traditional measures of culture applicable to teamwork
  - Technological innovation and globalization
- After review with Client, additional data on employee demographics led to additional criterion
  - Gender balance

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## AM+A Recommendations

- Four cities in addition to US corporate HQ

| | | |
|---|---|---|
| Amsterdam | Netherlands | Representative of North European, gender-balanced, egalitarian styles of collaboration |
| Bangalore | India | Representative of both S. Asian mentor-based collaboration and new modes of globalization |
| Dubai | United Arab Emirates | Representative of high power distance and new modes associated with globalization |
| Tokyo | Japan | Representative of East Asian, Confucian-based collaboration styles (high power distance and strong work group orientation) |

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## Additional Recommended Cities

- Feltham, UK, for Amsterdam:
  - US, UK share values; Amsterdam more egalitarian, gender-neutral
- Singapore for Dubai, UAE:
  - Dubai leads world pop growth, oil economy -> trade, finance, info
  - Singapore already successfully refocused economy on same objectives through more regulated, state-controlled process similar to Chinese values: strong leadership, high power distance, collectivism
- Seoul for Tokyo:
  - Seoul uses strong Confucian style of leadership that promotes group coordination and tends to limit individual action
- Optional (outside Client's sites): Shanghai
  - Western educ influence changing Chinese univs + Confucian culture; employees, less conservative than Japan, Korea, Singapore

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## Data Visualization of Recommendations

- AM+A recommended locations with 200+ employees so data statistically valid
- Values show HQ city as 1.0
- Black = max, White = min for criteria
- Cities provide strongly different culture attributes for study by Client of corporate culture and differences/ similarities in teamwork, which is objective of Client's research

## Data Visualization of Recommendations

**Cross-Cultural Comparisons with CA City**

| | CA City USA | Amsterdam Netherlands | Bangalore India | Singapore | Toyko Japan | Dubai UAE | Shanghai China |
|---|---|---|---|---|---|---|---|
| Power Distance, Hierarchy | 1.0 | 0.95 | 1.93 | 1.85 | 1.35 | **2.00** | 1.22 |
| Individualism | **1.0** | 0.88 | 0.53 | 0.22 | 0.51 | 0.42 | 0.94 |
| Digital Natives, Under 30 Years Old | 1.0 | 1.07 | **3.60** | 0.40 | 1.13 | 0.73 | 2.00 |
| High Growth, Newer Cities | 1.0 | 0.43 | 2.18 | 1.03 | 0.17 | **2.70** | 1.94 |
| Female/Male Gender Ratio | 1.0 | 0.90 | 0.58 | **1.10** | 0.61 | 0.42 | 0.81 |

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## Sources for Data

- **Power Distance**: With exception of Shanghai, data drawn from raw scores comparing 53 countries and national regions by Hofstede (1997)
  - Due to dependence on IBM data, Hofstede did not include China in original study, so China score drawn from Schwartz's comparison of 39 cultural groups (1994) for Hierarchy, normalized from a 9-point scale in ratio to US
- **Individualism:** As with Power Distance, all scores for individualism taken from Hofstede (1997) with exception of Shanghai
  - Shanghai score taken from Schwartz's score for Conservatism, reversed, normalized, and cross-validated against his scores for Egalitarian Commitment, Affective Autonomy, and Intellectual Autonomy
- **Digital Nativity:** This taken from employee demographic data
  - Variable defined as client employees 30 and younger
- **High Growth/ New Cities:** Data taken from urban agglomerations:
  - Average annual rate of change (%), *World urbanization prospects: The 2007 revision population database*, United Nations Population Division (esa.un.org/unup)
- **Female/Male Gender Ratio:** Data from client employee demographics



## Analytical Criteria: Traditional Measures of Culture, 1/10

- Since 1980s, variables from factor analysis:

| | |
|---|---|
| Hofstede's (1997) work dimensions (inc. Hofstede and Bond, 1988): | • Power distance<br>• Individualism *vs.* collectivism<br>• Long-term time-orientation (~ Confucian values) |
| Trompenaars and Hampden-Turner's (1998) cultural dimensions: | • Universalism *vs.* particularism<br>• Communitarianism *vs.* individualism<br>• Neutral *vs.* emotional expression (~ use of reason or feelings in relationships)<br>• Diffuse *vs.* specific range of involvement<br>• Achievement *vs.* ascription |
| Triandis' (2000) cultural syndromes: | • Individualism |
| Markus and Kitayama's (1991) notion of self-concept: | • Independent self-concept<br>• Interdependent self-concept |
| Schwartz's (1999) cultural dimensions: | • Conservatism<br>• Affective autonomy<br>• Intellectual autonomy<br>• Hierarchy<br>• Egalitarian Commitment<br>• Mastery<br>• Harmony |



## Analytical Criteria: Traditional Measures of Culture, 2/10

- Some culture concepts overlap, not bipolar
  - Some are exclusively high/low; others can be multiple
- Culture concepts associated with teamwork types
  - Hofstede: Hi power dist/collectivist: MX, CN (HK), SI
  - Hofstede: Hi power dist/individualist: FR
  - Hofstede: Low power dist/individualis: US, UK, NE
- Collectivist countries, high PD (respect authority)
  - Dependnt on ingroups, rely on strong leaders with moral authority
  - Avoid direct confrontation, but engineer situations to enableuse of rules for justified refusal
  - INhistorical variations: tradition of close coop and mentorship between experience and novice group memers
  - JPhistorical variations: managers are more separate from subords



## Analytical Criteria: Traditional Measures of Culture, 3/10

- Individualist cultures, high power distance:
  - Often develop burocratic systems to reconcile personal independence with absolute authority and centralized power
  - Contrast with collectivist cultures: more confrontational
- Indivdualist cultures, low power distance:
  - Tend to work in loose groups, treat others as peers
  - Allegiance to ingroups weak, easier to work with new people, outsiders
  - Different historical patterns: Scandinavia more egalitarian, feminine; work roles show less gender bias, groups seek to achieve consensus
- Hofstede: Complex
  - Surface validity used in business studies, but much changed in 30y
  - Bond challenged Hofstede re Chinese values
  - Hampden-Turner data more recent, partially overlap with Hofstede



## Analytical Criteria: Traditional Measures of Culture, 4/10

- Parsons' social systems teamwork concepts (1951):
  - **Universalists** use rules applied to everyone and rely on procedural equity; particularists see social situations as more complex, tend to apply different rules to different types of people
  - **Communitarians** (like collectivists) place group needs, objectives ahead of personal needs; individualists place their needs first
  - **People who display neutral affect** tend to use reason as basis for developing relationships; people who display more emotional affect are more open about their feelings and expect emotional responses
  - **People who have specific range of involvement** tend to view different business, personal contexts as separate; may recognize authority of manager at work but treat manager as equal outside
  - **People who have diffuse range of involvement** with work do not separate these contexts; manager whose authority they recognize at work will retain that authority when met in a different situation.

 

## Analytical Criteria: Traditional Measures of Culture, 5/10

- Two methods to assign group status, leadership:
  - **Achievement:** status earned through individuals personal accomplishments, especially work-related success
  - **Ascription:** Status due to an individual's titles, gender, age, class, or education.
  - Trompenaars and Hampden-Turner analyzed larger group of countries than Hofstede but did not always measure the same group of countries for each culture concept.
  - Using Trompenaars and Hampden-Turner's categories, AM+A classified client's work. Using these culture categories along with Hofstede's work dimensions began to show new differences between apparently similar countries like Netherlands *vs.*UK, and Japan *vs.* China.



## Analytical Criteria: Traditional Measures of Culture, 6/10

- Triandis: Individualism most important to explain behavior
  - Note: Individualism can be modified by wide range of cultural "syndromes," *e.g.*, social complexity, tightness (ethnic homogeneity *vs.* heterogeneity), and hierarchy.
  - Note: Cultures less complex or highly homogeneous tend to be collectivist; most people will display more conformity and suppress individual expression
  - Note: Experience with Japanese students and employees shows important to remember that people in tight or collectivist societies continue to think of themselves as highly individualist; they just choose to put group interests first



## Analytical Criteria: Traditional Measures of Culture, 7/10

- Markus, Kitayama: Concept of duality
  - individualism *vs.* collectivism too simplistic and unable to explain real-world behavior
  - Redefined phenomena as two mutually-coexisting concepts: Independent Self-concept and Interdependent Self-concept.
  - Their new variables better explain why American individualists give so broadly to charity while Malaysian collectivists don't
  - Strong membership in ingroups and interdependent self-concept may prevent support for others in so-called out-groups; by contrast, people with independent self-concept have weak alliance to their ingroups and can see people in outgroups as being individuals just like them
  - These two types of self-concept may be important when looking at matrix management systems and the use of temporary work groups: in some cultures, longer-term groups may be more effective



## Analytical Criteria: Traditional Measures of Culture, 8/10

- Schwartz's culture variables (late 1980s-mid 90s)
  - Data from many countries, values can stand alone but also correlated
  - **Conservativism** *vs.* **Intellectual and Affective Autonomy**, **Hierarchy** *vs.* **Egalitarian Commitment**, and **Mastery** *vs.* **Harmon**y
  - Conservatism (plus Hierarchy, and Mastery) roughly equates to Collectivism, Intellectual and Affective Autonomy and Egalitarian Commitment equate to Individualism
  - Harmony refers to respect for the natural world, not group harmony
  - Schwartz's values tend to highlight differences, *e.g.*, US, China focus on mastery for economic growth *vs.* northern Europe seeking stable growth to preserve the environment
  - Schwars tables do not list rankings for UK, UAE, Russian Federation, Saudi Arabia, or India, but does rank rest of client sites



## Analytical Criteria: Traditional Measures of Culture, 9/10

- Schwartz (1999) made clear predictions re cultural values and specific work behaviors

| **Hypothesized Compatibility and Conflict of Culture Value Emphases with Dimensions of Work** | | |
|---|---|---|
| | **Culture Value Emphases** | |
| **Dimensions of Work** | **Compatible** | **Conflicting** |
| *Work Centrality:* Contrasted with leisure, community, family, religion | Mastery<br>Hierarchy | Affective Autonomy<br>Egalitarianism<br>Harmony<br>Conservatism |
| *Societal Norms re Working:* Entitlement *vs.* Obligation | Egalitarianism<br>Intellectual Autonomy | Conservatism<br>Hierarchy |
| *Work Values:* Power | Hierarchy<br>Mastery | Harmony<br>Egalitarianism |
| *Work Values:* Intrinsic (personal growth and creativity) | Intellectual Autonomy<br>Affective Autonomy | Conservatism |
| *Work Values:* Extrinsic (monetary rewards) | Conservatism<br>Hierarchy | Intellectual Autonomy |
| *Work Values:* Social | Egalitarianism<br>Harmony | Hierarchy<br>Mastery |



## Analytical Criteria: Traditional Measures of Culture, 10/10

- What Schwartz's table suggests:
  - Asian countries and northern European countries should be very different in terms of work centrality
  - In addition, like Hofstede, Schwartz recognizes France as having unique blend of conservatism and intellectual and affective autonomy (roughly equivalent to high power-distance and strong individualism)
  - Finally, Schwartz includes element of environmental consciousness (relatively low for all countries with client's sites) with his emphasis on harmony

 

## Analytical Criteria: Technological Innovation and Globalization, 1/5

- Second set of criteria reflect recent changes in use of computers and communication technology and in global economics
- Growing importance of recognizing generation differences:
  - Rise of generation of digital natives
  - Development of high-growth cities and new forms of urban life



## Analytical Criteria: Technological Innovation and Globalization, 2/5

- Johnston, Johal (1997) used culture theory to define Internet as new "virtual culture region"
  - **Digital natives** or "millennials:" grew up surrounded by computers, mobile devices, video games, and Internet
  - **Digital Immigrants:** Older people, used other forms of technology first, held back by previous impressions of "right" way to do things
  - Many claims made about differences between two generations, *e.g*, by Prensky (2001) discussing changes in education:
  - ***Digital Natives:*** *used to receiving info really fast; like to parallel process and multi-task; prefer graphics before text; prefer random access (like hypertext); function best when networked; thrive on instant gratification, frequent rewards; prefer games to "serious" work*
  - ***Digital Immigrants:*** *typically have little appreciation for new skills Digital Natives acquired, perfected in years of interaction, practice*



## Analytical Criteria: Technological Innovation and Globalization, 3/5

- Key to understand full potential of new comm modes
  - Must ask digital natives how they simultaneously work together and apart through social media
  - Must identify both current and future types of collaboration
  - Must visit sites with large numbers of new hires and digital natives
  - In US, some contention between digital natives and baby boom generation: Baby boomers developed many traditional computer technologies but new focus on social media often escapes them; remain wedded to more structured media interactions, while digital natives thrive on instant availability and constant interaction
  - Outside US, young Indian (and Chinese) college graduates have typically been first to achieve computer literacy in their families; they join with fewer preconceptions about media and tend to see it in highly creative ways



## Analytical Criteria: Technological Innovation and Globalization, 4/5

- Rise of new types of cities: 2nd postmodern influence client must capture in collaboration study
  - Throughout Asia, and parts of Middle East, Latin America, and Africa, new cities developing on basis of new economic principles
  - **UAE:** In 1980, estimated pop about 1m; in 2009, 5m, by end of 2010, 7.5 m; for every child born in UAE in 2009, 22 migrants arrived, UAE world leader in immigration; 73.9% of working age pop (15–64) non-nationals with 2.74 men per woman; median age 30.1 years: 32 for men and 34.7 for women
  - **Singapore**: similarly doubled its pop from about 2.4m in 1980 to almost 5m in 2009, but its age and gender demographics are now less skewed; current pop growth about 1%/y mainly through immigration (15th in the world); gender ratio roughly equal, median age of 39 for both men and women
  - Both cities developed on basis of trade, finance, and information rather than manufacturing, agriculture, or government



## Analytical Criteria: Technological Innovation and Globalization, 5/5

- Summary of tech innovation, globalization criteria
  - Client's professionals and staff currently working in new cities more likely to be globally diverse, young, digital natives who can anticipate future collaboration
  - Dubai currently epitomizes both positive and negative effects of high growth and rapid urbanization
  - Investment in infrastructure has created a vibrant economy in the middle of the Gulf. However, gender ratios are highly skewed in favor of young men, and large numbers of expatriates are disconnected from traditional local culture
  - By contrast, Singapore followed much more planned path to growth; research likely to review more traditional Chinese attitudes to authority and collaboration



## Analytical Criteria: Equal Employment and Gender Ratio, 1/

- Demographic data enabled analysis of gender ratio
  - Hofstede: countries differ on a continuum of Masculinity and Femininity, which refer to traditional gender roles and to attitudes associated with each gender.
  - **Masculine societies:** men seek jobs requiring mastery; women seek jobs nurturing others; men expected to be assertive; women, modest
  - **Feminine societies:** men and women less subject to rigid gender expectations; men may be elementary school teachers; women, computer programmers; both genders tend to be modest, avoid direct conflict, and respect (and expect respect from) others.
  - Two aspects of a balanced gender ratio important for collaboration:
  - **Feminine societies** focus more on participation, persuasion, consensus; unions included in company management and techniques like participatory design popular
  - **Masculine societies** focus more on challenge, reward, individual recognition; Master programmers celebrated as role models

 

## Analytical Criteria: Equal Employment and Gender Ratio, 2/

- Summary of equal opportunity, gender ratio criteria
  - US has been fighting for equal employment in technical positions for decades
  - For a while in the 1990s, the gender ratio in computer science improved, but stereotypes of technology and of those who work in technological jobs ("geeks") have reduced number of women attracted to such positions.
  - As a result, AM+A suggested Amsterdam as site for study of collaboration in feminine cultures and Bangalore and/or Dubai as sites for study of teamwork in young, masculine cultures
  - According to employee demographics provided by client, gender ratio in Singapore is slightly higher than in company's HQ site or in Amsterdam.
  - Nevertheless, AM+A believed number of women in technical positions may well be higher in Netherlands and is more likely to provide an opportunity to analyze egalitarian styles of work



## Analytical Criteria: Add. Considerations, Corporate Culture and HQ Effect

- Challenges of collab between HQ and other sites
  - Client discussions revealed a challenge to collaboration between headquarters staff and the client employees in other countries
  - Opened discussion about corporate culture and its relation to national culture
  - All client employees made aware of corporate values, but many of these reflect classically US emphasis on personal fulfillment (empowerment, fun), mastery (innovation), efficiency (frugality), and continuous improvement
  - Teamwork critical, but *style* of teamwork tends to be more masculine than feminine
  - Consensus opinion: client's corporate values provide backdrop to discussions within company about collaboration and that differences in power between headquarters and other regions just as much, or more, influential than other factors



## Conclusions

- Discussion presents AM+A's analysis of country cultures and specific cities
- Presents impact on values, attitudes, concepts, and behaviors related to teamwork
- Analysis used by client to develop specific tools and techniques to improve collaboration, communication, and cooperation in multi-country teams



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[Based on Gould, and Marcus ((2011). ""Company Culture Audit to Improve Development Team's Collaboration, Communication, and Cooperation" *Proc.*, HCII 2011, Orlando, Fl, July 2011]

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## Mobile Trends and Culture Differences

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## Mobile Trends


Address human auditory abilities KR

Samsung:
- Bring music to hearing impaired: implanting mobile, 'upgrading human'
- Assist hearing capabilities to bridge people with hearing difficultly in communication and relationships

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## Mobile Trends


Develop unhealthy attitudes. JP

Samsung
- Detect Acute Stress by heart rate variability, using prototype mobile ECG Sensor.

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## Mobile Trends

JP

Address underexploited issues of users' ability to perceive and respond to smell.

Sony Ericsson :
- Add new sense to user's mobile experience (Aroma Sheet)
- Enhance physical and emotional 'well-being' experience.

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## Mobile Trends

KR

Samsung in China
- Use various sliding directions for different modes

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## Mobile Trends

Sky: OLED keypad environment
- 27 types of keypad
- Vibration motors on touch sensors: fun & feel

Add haptic (touch and movement sensing) feedback into interface to enhance user experience.


KR

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## Mobile Trends

Korea
- use double screens

KR

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## Mobile Trends


Gummi interface
- bend display to interact

KR

LG Philips e-paper (A4)
- flexible & durable screen
- 4096 color

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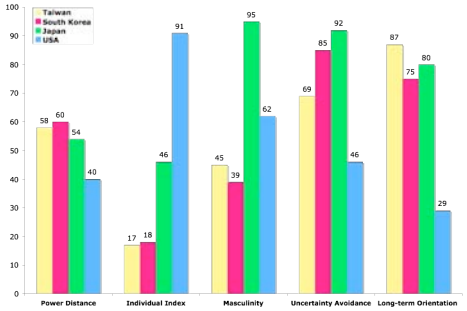
## Hofstede's Dimensions of Culture Index Table

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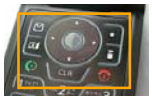
## Bottom layout difference

Standard Moto Razr for North America

US



Customized Moto Razr for FIRESTONE in Taiwan

TW

Centralized call function in US RAZR. Vs. Separated call function encouraging users to use localized online applications: 'i-mode' and 'video conference'.

Taiwan Moto Krzr maxx K3 Source: http://www.sogi.com.tw/park/content.asp?a_id=6107

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## Keypad Language Input

TW

Improved typing experience by special key set 'Won Xing System', using buttons, clustered in similar sounds between English and Chinese

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## Language (Character Differences)


TW

Business card digitalized, including Chinese character identified software

Digital business card scannable with phone to make difficult Chinese character input easier and faster.

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## Navigation: Icons and Metaphors


US


TW

Localized icon design using each metaphor, representing different meanings within each cultural context

Navigation system in Taiwan uses standard doorplate and noodles to represent “road” and “restaurant”

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## Navigation: Color Differences

More Colors ← → Fewer colors

Use less colors on icons and backgrounds in latest Korean mobile products (i.e. Samsung, LG) for viewers’ simple and easy eye flow.

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## Full Screen Mobile


KR US


TW

Simpler and less assertive icons and navigation techniques in Asian mobiles

Information hierarchy: highly populated and categorized (Asia) *vs.* informally organized and categorized structure (US)

Black background and icons more “cool,” less emotionally expressive users

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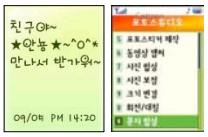
## Photo Editing


KR

Built-in multi-photo-editing options in Asian phones to enrich photo-sharing
- Examples: adding frame, “artsy” fonts, animation cartoon character, ASCII-art

Desire satisfied to create group by using personalized expression and language through custom selections

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## Calendar Application


TW KR

Asian versions use special I-mode online content of Chinese traditional calendar, which is combined with fortune forecast

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## Emoticons

: ) =( :'(
XD :P :O
US

US expresses emotion with mouth shapes vs. KR changes eye shapes

TW emoticons tend to use more Chinese characters

^-^ T_T @o@
=_= -_- >o<
KR

Orz _ rz (___ )@m
TW
(____ )_ ( )_ ~ __

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## Virtual Social Networking Space





Provides *interspaces* for people to coexist and communicate

Individualism *vs.* Collectivism: US prefers importance given to individuals *vs.* KR representations appear by themselves or within groups

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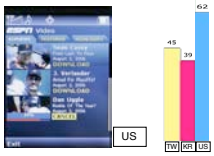
## Femininity *vs.* Masculinity





US: Attention gained through games and competitions

TW:
- Attention gained through poetry, visual aesthetics, and appeals to unifying values
- Mutual cooperation, exchange, and support (rather than mastery and winning)

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## Cuteness

Japanese, Korean, and Chinese visual design style tolerates, even celebrates, cuteness much more than EU+US

Examples found throughout UIs, publications, packaging of products and services

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## Multi-Media Message (MMS)



Realistic *vs.* Abstraction

Hard *vs.* Soft forms

Vivid *vs.* Pastel colors

Indirect *vs.* direct emotional expression

Avoiding cuteness, emphasis on clearness. *vs.* softer edges and shapes

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## Web 2.0

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## Topics

- Definition of Web 2.0
- Drivers and Trends
- General Strategy in Web 2.0
- Key Strategy in Web Environment
- Examples of 7 Cs
- Web 1.0 *vs.* Web 2.0
- Technology Support
- 7 Core Competencies of Web 2.0 Companies
- Web 2.0 Design Patterns
- Web 2.0 Visual Design Trends
- Web 2.0 Cultural Differences



## Definition of Web 2.0

- Major new trend that reinforces online information and social connection that was disordered, hidden, and disconnected
- Web 2.0 sites are different from Web 1.0 sites
  - Social networking, blogs, personal content, customization
  - Linkiness, not stickiness, not a walled portal



## Drivers and Trends

- Declining cost of computer storage and Internet bandwidth
  - More Internet users
  - Easier Internet accessibility
  - Massive content availability
- Declining cost of interpersonal connection or communication
- Information overload
- Lack of online-users' relationship management
  - Lack of relationship previously: visitors could not self-organize
  - New relationship explosion with large numbers or users and ability to connect



## General Strategy in Web 2.0

- Leveraged strategy in order to solve Web 1.0 challenges
- High level strategy in Web 2.0:
  - Manage/Free
  - Connect/Disconnect
  - Share/No Share



## Key Web Strategy: Content, Community, Commerce, Communication

- Co-create
  - Allow over-writing, no primary verbal editor, virtual team work
- Connect
  - Enable social networking, creating platform for making friends
  - Examples: Blogger, Myspace
- Customize
  - Foster Web user experience, users can decide what kinds of information they want to see and how to see it
  - Examples: Google's Adsense to decide the Ads, iGoogle, netvibes to make personal home page

## Examples of 7 Cs

| | Content | Community | Communication | Commerce |
|---|---|---|---|---|
| Co-create | Wikipedia, De.licio.us | CGTalk | writely | |
| Connect | Lime, YouTube, flickr | LinkedIn | facebook, AIM | craigslist |
| Customize (UI, UX) | Yahoo, netvibes, iGoogle | | Gmail | Google, Google Maps |



## Web 1.0 *vs.* Web 2.0

| Mode | Web 1.0 | Web 2.0 |
|---|---|---|
| Primary action | Read | Write, contribute |
| Primary unit of content | Page | Post/record |
| Viewed through | Static | Dynamic |
| Architecture | Web browser | Browser, RSS Readers |
| Content created by | Client Server | Web services |
| Audience, domain of | Web Coders<br>Geeks | Everyone<br>Mass amateurs |



## Technology Support

- **CSS** (Cascading Style Sheets)
  - Systematized Web design format
- **AJAX** (Asynchronous Javascript XML)
  - Rich internet application techniques
- **XACML** (Extensible Access Control Markup Language)
  - Declarative access control policy language in XML, processing model
- **SOAP** (Simple Object Access Protocol)
  - Exchanging XML-based messages over computer networks
- **REST** (Representational State Transfer)
  - Software architecture for hypermedia system (WWW)
- **Adobe Flex**
  - Enables development. deployment of cross-platform, rich-Internet applications based on Adobe's proprietary Macromedia Flash



## 7 Core Competencies of Web 2.0 Companies, 1/2

- Service with cost-effective scalability and control over hard-to-create data sources
- Make data richer as more people use services
- Trust users as co-developers
- Harness collective intelligence

http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html



## 7 Core Competencies of Web 2.0 Companies, 2/2

- Leverage long tail
  - Long tail: Collective power of many small sites that make up most of Web's content (Chris Anderson)
- Develop software above level of single device
- Emphasize lightweight user interfaces (lightweight programming models), development, and business models

http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html



## Design Patterns for Web 2.0, 1/3

- Long tail
  - Collect contents and usable data from small sites
  - Leverage customer self-service ability by sharing-oriented data management platform
- Data inside is next "Intel Inside"™
  - Seek to own unique, hard-to-create source of data for competitive advantage, because applications are increasingly data-driven
- Users add value
  - Extend Internet applications so users add their own data to that which originator provides
  - Involve users both implicitly and explicitly in adding value to application

http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html

## Design Patterns for Web 2.0, 2/3

- Network effects by default
  - Set inclusive defaults of aggregating users' data as side-effect of their use of application
- Some rights reserved
  - Make sure that barriers to adoption are low when benefits come from collective adoption
  - Follow existing standards and use licenses with as few restrictions as possible
  - Design For "hackability" and "remixability"

http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html



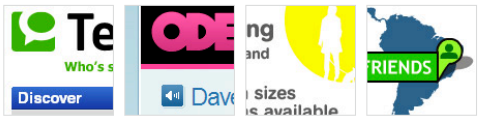
## Design Patterns for Web 2.0, 3/3

- Perpetual beta
  - Do not package new features into monolithic releases; instead add them on regular basis as part of user experience
  - Engage user as real-time testers and instrument service to know how people use new features
- Cooperate, don't control
  - Offer Web services interfaces and content syndication
  - Reuse data services of others
  - Support light weight programming models to allow for loosely-coupled system
- Software above level of single device
  - Design applications from beginning to integrate services across handheld devices, PCs, and internet servers

http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html



## Web 2.0 Visual Design, 1/6




- Green is the new gray
  - Bright, cheerful colors dominate Web 2.0
  - Green is unofficial color of Web 2.0, but saturated blues, orange, and pinks are also favorites
  - Bold primary colors suggest playful, fun attitude and draw attention to important page elements

Source: Visual Design of Web 2.0, Pixel Acres,http://f6design.com/journal/2006/10/21/the-visual-design-of-web-20



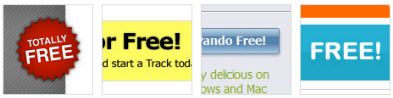
## Web 2.0 Visual Design, 2/6


- Rounded Everything
  - CSS techniques for achieving rounded corners helped make this style popular
  - Friendliness of rounded corners compatible with personal, informal tone of many Web 2.0 sites
  - Approach to type provides modern, playful identity to company's visual identity (think Google)

Source: Visual Design of Web 2.0, Pixel Acres,http://f6design.com/journal/2006/10/21/the-visual-design-of-web-20



## Web 2.0 Visual Design, 3/6

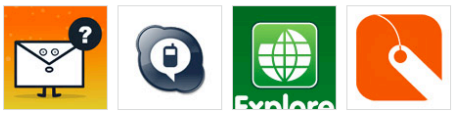



- Say "Free" loudly
  - Give away FREE accounts if company needs to convince visitors to sign up for killer application
  - Many Web 2.0 sites devote prime real estate to message that they offer some free service

Source: Visual Design of Web 2.0, Pixel Acres,http://f6design.com/journal/2006/10/21/the-visual-design-of-web-20



## Web 2.0 Visual Design, 4/6



- No (stock) photos, please
  - Few show stock photography of smiling support staff on Web 2.0 sites: tactic favored by small companies trying to mimic corporations
  - Simple icons and screenshots are more typical Web 2.0 imagery
  - 3D and beveled icons lend elegance and sparkle to page design that is otherwise fairly stark

Source: Visual Design of Web 2.0, Pixel Acres,http://f6design.com/journal/2006/10/21/the-visual-design-of-web-20

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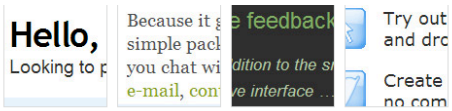
## Web 2.0 Visual Design, 5/6




- Big is beautiful
  - Bigger is definitely better when it comes to text
  - Large text easy on eye and, coupled with snappy copywriting, makes information easy to absorb.
  - Accessibility is cool; it's possible to be hotshot Web designer and still use enormous type
  - Body text often larger than 13 point, like primary school books

Source: Visual Design of Web 2.0, Pixel Acres,http://f6design.com/journal/2006/10/21/the-visual-design-of-web-20

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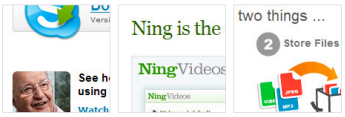
## Web 2.0 Visual Design. 6/6




- Breathing space abundant
  - Layout of Web 2.0 sites often seems minimal
  - With focus on legibility and ease of use, much use of white space
  - White space allows important information to stand out, provides rest for eye, and imparts sense of calm and order
  - Generous leading also makes text copy easier for eye to follow
  - Designed well, uncluttered page can be very tasteful

Source: Visual Design of Web 2.0, Pixel Acres,http://f6design.com/journal/2006/10/21/the-visual-design-of-web-20

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## Web 2.0 Cultural Differences: Login for Social Networking Website, 1/2


| | US | Taiwan | Korea |
|---|---|---|---|
| Log in with ID | | ✓ | |
| Log in with Email | ✓ | | ✓ |
| Password | ✓ | ✓ | ✓ |
| Remember Me | ✓ | ✓ | ✓ |
| Forgot Password? | ✓ | | |
| Secure Log in | | | ✓ |

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## Web 2.0 Cultural Differences: Login for Social Networking Website, 2/2


| | US | Korea |
|---|---|---|
| Log in with Email | ✓ | ✓ |
| Password | ✓ | ✓ |
| Remember Me | ✓ | ✓ |
| Forgot Password? | ✓ | |
| Secure Log in | | ✓ |

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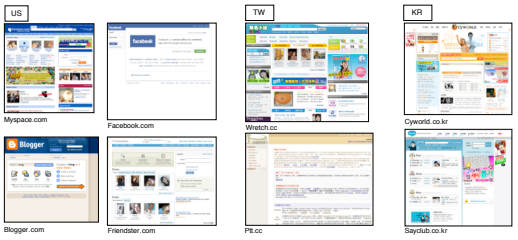
## Web 2.0 Cultural Differences: Social Networking Site Appearance, 1/2




| | US | Taiwan | Korea |
|---|---|---|---|
| Information Heavy | | ✓ | ✓ |
| Simple Design | ✓ | | |

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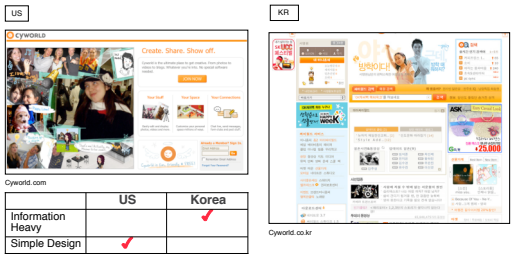
## Web 2.0 Cultural Differences: Social Networking Site Appearance, 2/2




| | US | Korea |
|---|---|---|
| Information Heavy | | ✓ |
| Simple Design | ✓ | |

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## Web 2.0 Cultural Differences: Scrap-book Metaphor, Mental Model, 1/4

US

myspace.com

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## Web 2.0 Cultural Differences: Photo Album Metaphor, Mental Model

TW

wretch.cc

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## Web 2.0 Cultural Differences: Diary Metaphor, Mental Model

KR

cyworld.co.kr



sayclub.com

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## Web 2.0 Cultural Differences: Social Network Website Metaphor, M Model

US

Cywono.com

myspace.com

KR

Wretch.cc

KR

Cyworld.co.kr

Sayclub.com

| | US | Taiwan | Korea |
|---|---|---|---|
| Metaphor, Mental Model | Scrapbook | Photo album | Diary |

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## Web 2.0 Cultural Differences, 1/2: Navigation in Knowledge Co-Creation

KR

**Top Navigation Model**

1. Knowledge Home
2. Knowledge Q&A
3. Counseling
4. Open knowledge
5. Knowledge leaders(experts)
6. Sponsored knowledge
7. My knowledge

**Special Images: Cartoon**

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## Web 2.0 Cultural Differences, 2/2: Navigation in Knowledge Co-Creation

US


**Top Navigation Model**

**: Used verbs**

- Ask
- Answer
- Discover

**Special Images**: Emoticon

## Cultural Differences: Appearance in Knowledge Co-Creation

KR

US

| | Korea | US |
|---|---|---|
| Common | Major Activities of co-creation websites<br>– Academic of learning<br>– Experienced knowledge and daily life advice sharing | |
| Top Navigation Model | 1. Knowledge Home<br>2. Knowledge Q&A<br>3. Counseling<br>4. Open knowledge<br>5. Knowledge leaders(experts)<br>6. Sponsored knowledge<br>7. My knowledge | 1. Ask<br>- Post question<br>2. Answer<br>- Open question<br>3. Discover<br>- Resolved Question |
| Appearance | Color: Purple<br>Special Image: Cartoon | Green<br>Simple Emoticon |



## Web 2.0 Cultural Differences: Q+A in Knowledge Co-Creation Site, 1/4

KR

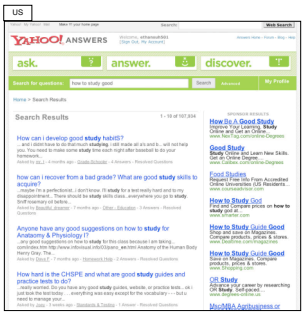
**Question:** Comparatively abstract words and description on question

**Answers:** more experience-based knowledge



## Web 2.0 Cultural Differences: Q+A in Knowledge Co-Creation Site, 2/4

US



**Question:** Precise word of descriptions on question

**Answers:**
a. Personal opinion with logical basos
b. Provide direct personal information display
c. Displays option of various communication methods to reach objective
d. Picture display
e. Statistic Accuracy Info of the answer



## Web 2.0 Cultural Differences: Q+A in Knowledge Co-Creation Site, 3/4

US

Question was one about "What is best car?"

Answers typically American: specific high-cost solutions



## Web 2.0 Cultural Differences: Q+A in Knowledge Co-Creation Site, 4/4

KR

US

| | Korea | US |
|---|---|---|
| Mental Model and Navigation | **Question**: Comparatively abstract words and description on question<br><br>**Answers**: more experience-based knowledge | **Question**: Precise word of descriptions on question<br><br>**Answers**:<br>a. Personal opinion with logic based<br>b. Provide direct personal information display<br>c. Displays option of various communication methods to reach to<br>d. Picture display<br>e. Statistic Accuracy Info of the answer |



## Web 2.0 Cultural Differences: Customizable Content Category, 1/4

US

Customizable Category to users' favorite contents: News, Time, Weather, Movie, etc.

## Web 2.0 Cultural Differences: Customizable Content Category, 2/4

KR


No customization is allowed



## Web 2.0 Cultural Differences: Customizable Content Category, 3/4

TW


No customization is allowed



## Web 2.0 Cultural Differences: Customizable Content Category, 4/4

US KR TW


| | US | Korea | Taiwan |
|---|---|---|---|
| Customization of Content Category | ✓ | | |



## Summary

- Web 2.0 sites share common features that distinguish them from Web 1.0 sites
- Culture differences appear even within Web 2.0 sites
- Future research and design studies will reveal more specific details, enabling culture-sensitive guidelines



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|---|---|---|---|---|
| Co-create | Wikipedia, De.licio.us | CGTalk | writely | |
| Connect | Lime, YouTube, flickr | LinkedIn | facebook, AIM | craigslist |
| Customize (UI, UX) | Gadway, netvibes, iGoogle | | Gmail | Google, Google Maps |



## Web 1.0 *vs.* Web 2.0

| Mode | Web 1.0 | Web 2.0 |
|---|---|---|
| Primary action | Read | Write, contribute |
| Primary unit of content | Page | Post/record |
| Viewed through | Static | Dynamic |
| Architecture | Web browser | Browser, RSS Readers |
| Content created by | Client Server | Web services |
| Audience, domain of | Web Coders<br>Geeks | Everyone<br>Mass amateurs |



## Technology Support

- **CSS** (Cascading Style Sheets)
  - Systematized Web design format
- **AJAX** (Asynchronous Javascript XML)
  - Rich internet application techniques
- **XACML** (Extensible Access Control Markup Language)
  - Declarative access control policy language in XML, processing model
- **SOAP** (Simple Object Access Protocol)
  - Exchanging XML-based messages over computer networks
- **REST** (Representational State Transfer)
  - Software architecture for hypermedia system (WWW)
- **Adobe Flex**
  - Enables development. deployment of cross-platform, rich-Internet applications based on Adobe's proprietary Macromedia Flash



## 7 Core Competencies of Web 2.0 Companies, 1/2

- Service with cost-effective scalability and control over hard-to-create data sources
- Make data richer as more people use services
- Trust users as co-developers
- Harness collective intelligence

http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html



## 7 Core Competencies of Web 2.0 Companies, 2/2

- Leverage long tail
  - Long tail: Collective power of many small sites that make up most of Web's content (Chris Anderson)
- Develop software above level of single device
- Emphasize lightweight user interfaces (lightweight programming models), development, and business models

http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html



## Design Patterns for Web 2.0, 1/3

- Long tail
  - Collect contents and usable data from small sites
  - Leverage customer self-service ability by sharing-oriented data management platform
- Data inside is next "Intel Inside"™
  - Seek to own unique, hard-to-create source of data for competitive advantage, because applications are increasingly data-driven
- Users add value
  - Extend Internet applications so users add their own data to that which originator provides
  - Involve users both implicitly and explicitly in adding value to application

http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html

## Design Patterns for Web 2.0, 2/3

- Network effects by default
  - Set inclusive defaults of aggregating users' data as side-effect of their use of application
- Some rights reserved
  - Make sure that barriers to adoption are low when benefits come from collective adoption
  - Follow existing standards and use licenses with as few restrictions as possible
  - Design For "hackability" and "remixability"

http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html



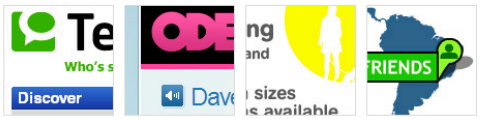
## Design Patterns for Web 2.0, 3/3

- Perpetual beta
  - Do not package new features into monolithic releases; instead add them on regular basis as part of user experience
  - Engage user as real-time testers and instrument service to know how people use new features
- Cooperate, don't control
  - Offer Web services interfaces and content syndication
  - Reuse data services of others
  - Support light weight programming models to allow for loosely-coupled system
- Software above level of single device
  - Design applications from beginning to integrate services across handheld devices, PCs, and internet servers

http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html



## Web 2.0 Visual Design, 1/6




- Green is the new gray
  - Bright, cheerful colors dominate Web 2.0
  - Green is unofficial color of Web 2.0, but saturated blues, orange, and pinks are also favorites
  - Bold primary colors suggest playful, fun attitude and draw attention to important page elements

Source: Visual Design of Web 2.0, Pixel Acres,http://f6design.com/journal/2006/10/21/the-visual-design-of-web-20



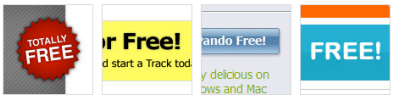
## Web 2.0 Visual Design, 2/6


- Rounded Everything
  - CSS techniques for achieving rounded corners helped make this style popular
  - Friendliness of rounded corners compatible with personal, informal tone of many Web 2.0 sites
  - Approach to type provides modern, playful identity to company's visual identity (think Google)

Source: Visual Design of Web 2.0, Pixel Acres,http://f6design.com/journal/2006/10/21/the-visual-design-of-web-20



## Web 2.0 Visual Design, 3/6

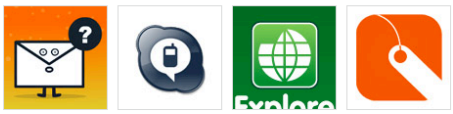



- Say "Free" loudly
  - Give away FREE accounts if company needs to convince visitors to sign up for killer application
  - Many Web 2.0 sites devote prime real estate to message that they offer some free service

Source: Visual Design of Web 2.0, Pixel Acres,http://f6design.com/journal/2006/10/21/the-visual-design-of-web-20



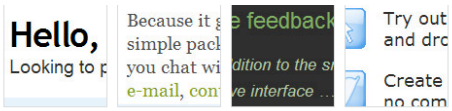
## Web 2.0 Visual Design, 4/6



- No (stock) photos, please
  - Few show stock photography of smiling support staff on Web 2.0 sites: tactic favored by small companies trying to mimic corporations
  - Simple icons and screenshots are more typical Web 2.0 imagery
  - 3D and beveled icons lend elegance and sparkle to page design that is otherwise fairly stark

Source: Visual Design of Web 2.0, Pixel Acres,http://f6design.com/journal/2006/10/21/the-visual-design-of-web-20

## Web 2.0 Visual Design, 5/6

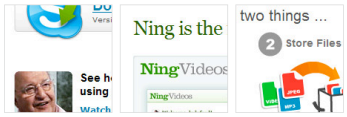



- Big is beautiful
  - Bigger is definitely better when it comes to text
  - Large text easy on eye and, coupled with snappy copywriting, makes information easy to absorb.
  - Accessibility is cool; it's possible to be hotshot Web designer and still use enormous type
  - Body text often larger than 13 point, like primary school books

Source: Visual Design of Web 2.0, Pixel Acres,http://f6design.com/journal/2006/10/21/the-visual-design-of-web-20



## Web 2.0 Visual Design. 6/6




- Breathing space abundant
  - Layout of Web 2.0 sites often seems minimal
  - With focus on legibility and ease of use, much use of white space
  - White space allows important information to stand out, provides rest for eye, and imparts sense of calm and order
  - Generous leading also makes text copy easier for eye to follow
  - Designed well, uncluttered page can be very tasteful

Source: Visual Design of Web 2.0, Pixel Acres,http://f6design.com/journal/2006/10/21/the-visual-design-of-web-20



## Web 2.0 Cultural Differences: Login for Social Networking Website, 1/2


| | US | Taiwan | Korea |
|---|---|---|---|
| Log in with ID | | ✓ | |
| Log in with Email | ✓ | | ✓ |
| Password | ✓ | ✓ | ✓ |
| Remember Me | ✓ | ✓ | ✓ |
| Forgot Password? | ✓ | | |
| Secure Log in | | | ✓ |

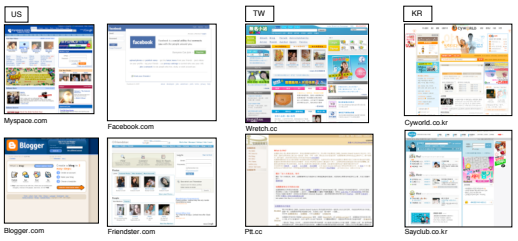


## Web 2.0 Cultural Differences: Login for Social Networking Website, 2/2


| | US | Korea |
|---|---|---|
| Log in with Email | ✓ | ✓ |
| Password | ✓ | ✓ |
| Remember Me | ✓ | ✓ |
| Forgot Password? | ✓ | |
| Secure Log in | | ✓ |



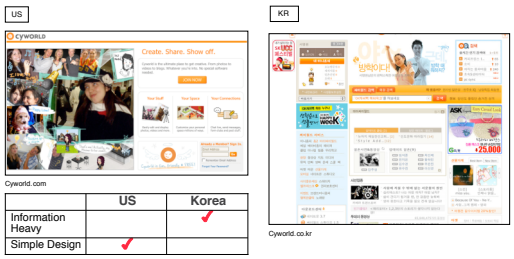
## Web 2.0 Cultural Differences: Social Networking Site Appearance, 1/2




| | US | Taiwan | Korea |
|---|---|---|---|
| Information Heavy | | ✓ | ✓ |
| Simple Design | ✓ | | |



## Web 2.0 Cultural Differences: Social Networking Site Appearance, 2/2




| | US | Korea |
|---|---|---|
| Information Heavy | | ✓ |
| Simple Design | ✓ | |

## Web 2.0 Cultural Differences: Scrap-book Metaphor, Mental Model, 1/4

US

myspace.com



## Web 2.0 Cultural Differences: Photo Album Metaphor, Mental Model

TW

wretch.cc



## Web 2.0 Cultural Differences: Diary Metaphor, Mental Model

KR

cyworld.co.kr sayclub.com



## Web 2.0 Cultural Differences: Social Network Website Metaphor, M Model

US KR KR

Cyworld.com Wretch.cc Cyworld.co.kr Sayclub.com myspace.com

| | US | Taiwan | Korea |
|---|---|---|---|
| Metaphor, Mental Model | Scrapbook | Photo album | Diary |



## Web 2.0 Cultural Differences, 1/2: Navigation in Knowledge Co-Creation

KR

**Top Navigation Model**

1. Knowledge Home
2. Knowledge Q&A
3. Counseling
4. Open knowledge
5. Knowledge leaders(experts)
6. Sponsored knowledge
7. My knowledge

**Special Images: Cartoon**



## Web 2.0 Cultural Differences, 2/2: Navigation in Knowledge Co-Creation

US

**Top Navigation Model**

**: Used verbs**

- Ask
- Answer
- Discover

**Special Images**: Emoticon

## Cultural Differences: Appearance in Knowledge Co-Creation

KR

US

| | Korea | US |
|---|---|---|
| Common | Major Activities of co-creation websites<br>– Academic of learning<br>– Experienced knowledge and daily life advice sharing | |
| Top Navigation Model | 1. Knowledge Home<br>2. Knowledge Q&A<br>3. Counseling<br>4. Open knowledge<br>5. Knowledge leaders(experts)<br>6. Sponsored knowledge<br>7. My knowledge | 1. Ask<br>- Post question<br>2. Answer<br>- Open question<br>3. Discover<br>- Resolved Question |
| Appearance | Color: Purple<br>Special Image: Cartoon | Green<br>Simple Emoticon |



## Web 2.0 Cultural Differences: Q+A in Knowledge Co-Creation Site, 1/4

KR

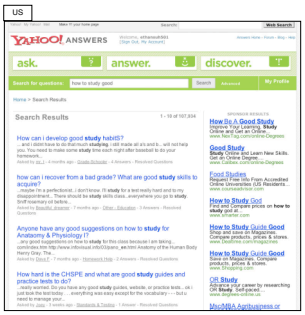
**Question:** Comparatively abstract words and description on question

**Answers:** more experience-based knowledge



## Web 2.0 Cultural Differences: Q+A in Knowledge Co-Creation Site, 2/4

US



**Question:** Precise word of descriptions on question

**Answers:**
a. Personal opinion with logical basos
b. Provide direct personal information display
c. Displays option of various communication methods to reach objective
d. Picture display
e. Statistic Accuracy Info of the answer



## Web 2.0 Cultural Differences: Q+A in Knowledge Co-Creation Site, 3/4

US

Question was one about "What is best car?"

Answers typically American: specific high-cost solutions



## Web 2.0 Cultural Differences: Q+A in Knowledge Co-Creation Site, 4/4

KR

US

| | Korea | US |
|---|---|---|
| Mental Model and Navigation | **Question**: Comparatively abstract words and description on question<br><br>**Answers**: more experience-based knowledge | **Question**: Precise word of descriptions on question<br><br>**Answers**:<br>a. Personal opinion with logic based<br>b. Provide direct personal information display<br>c. Displays option of various communication methods to reach to<br>d. Picture display<br>e. Statistic Accuracy Info of the answer |



## Web 2.0 Cultural Differences: Customizable Content Category, 1/4

US

Customizable Category to users' favorite contents:
News, Time, Weather, Movie, etc.

## Web 2.0 Cultural Differences: Customizable Content Category, 2/4

KR


No customization is allowed



## Web 2.0 Cultural Differences: Customizable Content Category, 3/4

TW


No customization is allowed



## Web 2.0 Cultural Differences: Customizable Content Category, 4/4

US KR TW


| | US | Korea | Taiwan |
|---|---|---|---|
| Customization of Content Category | ✓ | | |



## Summary

- Web 2.0 sites share common features that distinguish them from Web 1.0 sites
- Culture differences appear even within Web 2.0 sites
- Future research and design studies will reveal more specific details, enabling culture-sensitive guidelines



## Web 2.0

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With the assistance of Ethan Suh, Albert Wang, Institute of Design, IIT, Chicago

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 1

# Cross-Cultural Analysis of Social Network Services (SNSs) in Japan, Korea, and the USA

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Primary Research/Writing Assistant: Niranjan Krishnamurthi, Analyst
Research Assistants: David Chang, Kaoru Kimura, Hye-min Kim
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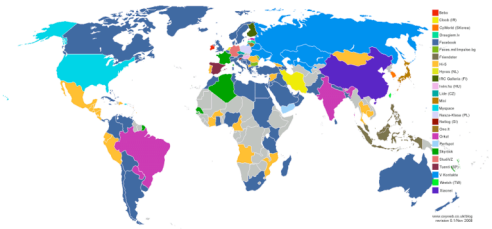
AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 2

# SNSs Around the World



AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 3

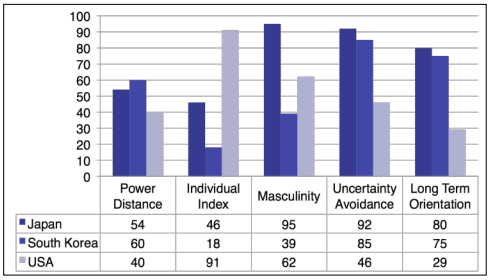
# Introduction

- SNS sites increasingly popular across globe
- Success of site in one country does not guarantee success in other countries
  - MySpace: Leader in home country (USA), in others, not
  - CyWorld: Leader in home counry (Korea); in others, not
- Culture can be used as basis to compare and contrast design elements in SNSs from Japan, South Korea, and USA

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 4

# Background Work

## Geert Hofstede's 5 Cultural Dimensions




| | Power Distance | Individual Index | Masculinity | Uncertainty Avoidance | Long Term Orientation |
|---|---|---|---|---|---|
| Japan | 54 | 46 | 95 | 92 | 80 |
| South Korea | 60 | 18 | 39 | 85 | 75 |
| USA | 40 | 91 | 62 | 46 | 29 |

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 5

# Background Work: Corporate Global Web UI and Influence of Culture

- Compared Hofstede's 5 cultural dimensions with 5 UI components for 12 B2B and B2C sites

| Components / Dimensions | Power Distance | Individuality Index | Masculinity *vs.* Femininity | Uncertainty Avoidance | Long Term Orientation |
|---|---|---|---|---|---|
| Metaphor | | | | | |
| Mental Model | | | | | |
| Navigation | | | | | |
| Interaction | | | | | |
| Appearance | | | | | |

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 6

# Research Method

- Analysis of 4 key pages for each SNS
- First Page
  - Introduces services provided to members and non-members
- Sign-up Page
  - Allows users to join the SNS
- Sign-in Page
  - Allows users to enter members-only area
  - Sometimes unique page, sometimes embedded in First Page
- Home Page
  - Provides access to main elements of SNS
  - First page after signing-in

## Method

- AM+A analyzed these details:

| First Page | Home Page | Sign-up Page | Sign-in Page |
|---|---|---|---|
| Public display of member photos | Display of unknown members | Display of site benefits | Location of sign-in link/box on first page |
| Symmetrical layout | Symmetrical layout | User identity authentication | Prominent sign-in link/box on first page |
| Selling explanation | Customization / Personalization | Type of privacy statement | Use of separate page for sign-in |
| Use of icons | Use of icons | Use of icons | Use of icons |



## Power Distance: Navigation and User-Identity Authentication

- Cyworld (USA)
  - Low power distance (40)
  - User identity not verified
- Cyworld (South Korea)
  - High power distance (60)
  - User identity verified using credit card and cell-phone number



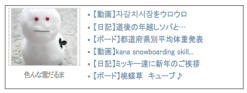

## Collectivism vs. Individualism: Metaphors, Display of Private Photos

- Mixi (Japan)
  - Low individuality index (46)
  - Non-members cannot access members' pictures and profiles
- MySpace (USA)
  - High individuality index (91)
  - Members' pictures and profiles displayed on first page
  - Accessible by non-members




## Collectivism vs. Individualism: Appearance, Use of Cartoons

- Cyworld (USA)
  - High individuality index (91)
  - Profile pictures are of members themselves
- Cyworld (Japan)
  - Low individuality index (46)
  - Profile pictures are of cartoons, animals, and celebrities



## Femininity *vs.* Masculinity: Navigation, Limited *vs.* Variable Choices

- MySpace (USA)
  - Less masculine (62)
  - Many choices in home page including music, videos and open applications
- Mixi (Japan)
  - More masculine (95)
  - Limited choices, no videos, closed applications





## Uncertainty Avoidance: Metaphors, Use of Icons

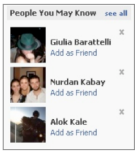
- Fotolog (USA)
  - Lower uncertainty avoidance (46)
  - Scarce use of icons on Home Page
- Mixi (Japan)
  - Higher uncertainty avoidance (92)
  - Iconsl for many items on Home Page



## Uncertainty Avoidance: Mental Model, Display of Strangers

- Facebook (USA)
  - Lower uncertainty avoidance (46)
  - Feature called "People You May Know" to expand user's friends list
- Feature not present in Japanese or South Korean SNSs
  - Higher uncertainty avoidance for Japan (92) and South Korea (85)






## Uncertainty Avoidance: Navigation, Unique Sign-in Page

- Ning (USA)
  - Lower uncertainty avoidance (46)
  - Sign-in link to a new page
  - Inconspicuous placement at top right-hand corner of page
- LinkNow (South Korea)
  - Higher uncertainty avoidance (85)
  - Sign-in box prominently displayed on first page




## Uncertainty Avoidance: Appearance, Symmetrical Design

- Ning (USA)
  - Lower uncertainty avoidance (46)
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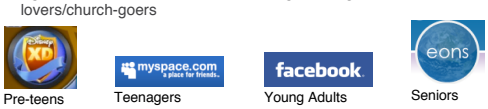
## Long-Term Orientation: Mental Model, Purpose/Age Divide

- Weak Long-Term Orientation
  - USA (29)
  - Age and content divisions for SNSs, e.g., teenagers/seniors, book-lovers/church-goers




- Strong Long-Term Orientation
  - Japan (80) and South Korea (75)
  - SNSs cater to general audience



## Conclusion

- Study indicates: Culture matters
- International ventures by SNSs have not been very successful thus far
  - Facebook and MySpace into Japan
  - Cyworld into the USA and Japan
- More research to be done
  - Explore differences in other areas of 5 by 5 matrix
  - Obtain data on SNSs from Europe and other countries
  - Use best-of-breed dimensions to replace Hofstede's cultural dimensions
  - Explore design of SNS metadata visualization for challenging context of large number of messages from friends and family, applicants, events.



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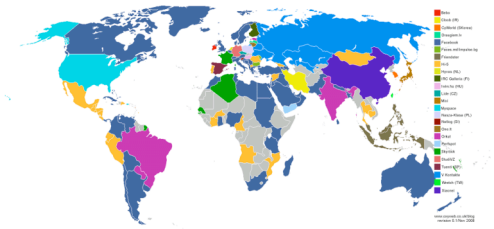



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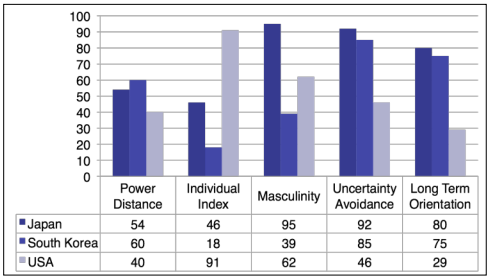


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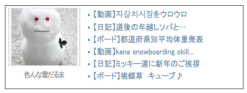
- Cyworld (Japan)
  - Low individuality index (46)
  - Profile pictures are of cartoons, animals, and celebrities



## Femininity *vs.* Masculinity: Navigation, Limited *vs.* Variable Choices

- MySpace (USA)
  - Less masculine (62)
  - Many choices in home page including music, videos and open applications
- Mixi (Japan)
  - More masculine (95)
  - Limited choices, no videos, closed applications





## Uncertainty Avoidance: Metaphors, Use of Icons

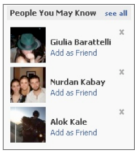
- Fotolog (USA)
  - Lower uncertainty avoidance (46)
  - Scarce use of icons on Home Page
- Mixi (Japan)
  - Higher uncertainty avoidance (92)
  - Iconsl for many items on Home Page



## Uncertainty Avoidance: Mental Model, Display of Strangers

- Facebook (USA)
  - Lower uncertainty avoidance (46)
  - Feature called "People You May Know" to expand user's friends list
- Feature not present in Japanese or South Korean SNSs
  - Higher uncertainty avoidance for Japan (92) and South Korea (85)






## Uncertainty Avoidance: Navigation, Unique Sign-in Page

- Ning (USA)
  - Lower uncertainty avoidance (46)
  - Sign-in link to a new page
  - Inconspicuous placement at top right-hand corner of page
- LinkNow (South Korea)
  - Higher uncertainty avoidance (85)
  - Sign-in box prominently displayed on first page




## Uncertainty Avoidance: Appearance, Symmetrical Design

- Ning (USA)
  - Lower uncertainty avoidance (46)
  - Sign-in link to a new page
  - Inconspicuous placement at top right-hand corner of page
- LinkNow (South Korea)
  - Higher uncertainty avoidance (85)
  - Sign-in box prominently displayed on first page




## Long-Term Orientation: Mental Model, Purpose/Age Divide

- Weak Long-Term Orientation
  - USA (29)
  - Age and content divisions for SNSs, e.g., teenagers/seniors, book-lovers/church-goers

Pre-teens | Teenagers | Young Adults | Seniors

- Strong Long-Term Orientation
  - Japan (80) and South Korea (75)
  - SNSs cater to general audience



## Conclusion

- Study indicates: Culture matters
- International ventures by SNSs have not been very successful thus far
  - Facebook and MySpace into Japan
  - Cyworld into the USA and Japan
- More research to be done
  - Explore differences in other areas of 5 by 5 matrix
  - Obtain data on SNSs from Europe and other countries
  - Use best-of-breed dimensions to replace Hofstede's cultural dimensions
  - Explore design of SNS metadata visualization for challenging context of large number of messages from friends and family, applicants, events.



## Cross-Cultural Analysis of Social Network Services in Japan, Korea, and the USA

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# Exercise 1: Role Playing of Cultural Dimension

**Exercise Format**
Each group will focus on interpersonal differences based on cultural origins and the cultural models introduced in the lecture. Groups/individuals will report their experiences.

**Dialogue 1**

**More Study**
[Mr. Johnson is from the USA and M. Trudeau is from France]

**Mr. Johnson:** What do you think of the new plan?
**M. Trudeau:** Seems OK, but I'm still studying it. I want to be sure.
**Mr. Johnson**: Still studying it after three weeks? It's not that complicated.
**M**. **Trudeau:** There are one or two aspects that might be a problem
**Mr. Johnson:** Oh, I know that. But we should put it in place and work the bugs out later
**M. Trudeau:** Seriously?

**Dialogue 2**

**A Pat on the Back**
[Ms. Walden is from the United States; Mr. Kaneda and his team are from Japan.]

**Mr. Kaneda:** Are you satisfied then, Ms. Walden, with the work of the accounting division?
**Ms. Walden:** Very Much, Their output has improved tremendously.
**Mr. Kaneda:** They're very proud of their work.
**Ms. Walden:** As soon as you put Mr.Yamamoto in charge, things began to turn around.
**Mr. Kaneda:** Yes, the whole team is working very smoothly now.
**Ms. Walden:** Will you be giving Mr. Yamamoto some kind of recognition then?
**Mr. Kaneda:** Excuse me?
**Ms. Walden:** You know. An award or something?
**Mr. Kaneda** I hardly think so. We wouldn't want to embarrass him after al he has done.

**Dialogue 3**

**The Overdue Claim**
[Ms. Harris is from Canada and Miss Chen is from China]

**Ms. Harris:** I was wondering if my claim has been processed yet.
**Miss Chen:** No, not just yet.
**Ms. Harris:** How long will it take?
**Miss Chen:** No longer than two weeks.
**Ms. Harris:** But it's been four weeks!
**Miss Chen:** This is unusual.

**Ms. Harris:** Maybe it's lost.
**Miss Chen:** Oh no. It can't be lost.

**Dialogue 4** **Performance Evaluation**
[Mr. Coyle is form the United States and Khalil is from the Middle East]

**Mr. Coyle:** Thanks for coming, Khalil. Let's go over this performance evaluation together, shall we?
**Khalil:** Whatever you'd like, sir.
**Mr. Coyle:** As you know, you're quite strong in most areas, There are just a couple of areas where you could be stronger.
**Khalil:** I see.
**Mr. Coyle:** One is in writing, which isn't easy for you, is it?
**Khalil:** No, sir.
**Mr. Coyle** And the other is in identifying training needs. Some of your staff could use more computer training in particular.
**Khalil:** Yes.
**Mr. Coyle:** Anyway, it's all written here. You can read it. Otherwise, no serious problems.
**Kahlil:** I'm very sorry to disappoint you, sir.

**Dialogue 5** **Dr. de Leon**
[Ms. Porter is from the United States and Mr. Domingo is from Mexico]

**Ms. Porter:** I heard the board has chosen a new CEO.
**Mr. Domingo:** Yes, they've appointed Dr. Manuel Cabeza de Leon of the de Leon family.
**Ms. Porter** Who is he?
**Mr. Domingo** It's an old family with large landholdings in Guadalajara Province.
**Ms. Porter:** What is his background?
**Mr. Domingo:** I just told you.
**Ms. Porter:** I mean does he know anything about the textile industry?
**Mr. Domingo:** I don't know.
**Ms. Porter:** Do you think he's a good choice?
**Mr. Domingo:** Dr. de Leon? I'm sure.

**Dialogue 6** **Thumbs Down**
[Jenny is from the United States and Tomoko from Japan]

**Jenny:** How did the meetings go last night?
**Tomoko**: It was very a useful discussion.
**Jenny:** How so?
**Tomoko:** We all talked. And Mr. Takeda explained his reservations about the proposal
**Jenny:** Did anyone else agree with him?
**Tomoko:** No. He was the only one who has some doubts.
**Jenny:** Then we won the vote.
**Tomoko:** Oh, there was no vote of course. We postponed it.

**Dialogue 7** **A Good Price**
[Ms. Young is from the United States and Mr. Kawabata is from Japan]

**Ms. Young:** We will charge you $5 per unit if you order 10,000 units.
**Mr. Kawabata:** That's a good price, Mr. Young.
**Ms. Young:** So you accept that price?
**Mr. Kawabata:** It's very good.
**Ms. Young:** Great! Let's talk about a delivery schedule then.

**Dialogue 8** **The Division Chiefs Meet**
[Ms. Thompson is from the United States and Mrs. Thatcher is from the United Kingdom]

**Ms. Thompson:** Have production figures improved any since our last meeting?
**Mrs. Thatcher:** No, no improvement since our last division chiefs' meeting, I'm afraid. There's something not quite right.
**Ms. Thompson:** What do you think is going on?
**Mrs. Thatcher:** We don't really have the full picture. We need to know more about what's going on the shop floor.
**Ms. Thompson:** That's what I thought. But now I'm not so sure that is where the problem is.
**Mrs. Thatcher:** Why do you say that?
**Ms. Thompson:** I invited several shop managers to come to this meeting today, but they said there is nothing to report.

**Dialogue 9** **Small Successes**
[Ms Thomas is from the United States and Mr. Ohmae is from Japan]

**Ms Thomas:** Well, I understand your company is one of the best architectural firms in Kyoto.
**Me Ohmae:** Thank you for this invitation.
**Ms. Thomas:** On the contrary, it's our pleasure. Now it says here you've had a very successful business for almost thirty years.
**Mr. Ohmae:** We've had some small success, yes. Did you speak to Mr. Mizawa?
**Ms Thomas:** Yes, I did. He said many of your buildings have won awards.
**Mr. Ohmae:** A few Perhaps.
**Ms. Thomas:** And you've had a lot of experience with office buildings.
**Mr Ohmae:** We have designed a few.
**Ms. Thomas:** Can you handle a project of this size?
**Mr. Ohmae:** That's possible.
**Ms. Thomas:** Do you have some hesitation in taking on this project?
**Mr. Ohmae:** Hesitation? Excuse me, but no.

**Dialogue 10** **Basics**
[Mr. Holt is from the United States and Miss Li is from Taiwan]

**Miss Li:** And as we have said, this is all part of the vision of our founder.
**Mr. Holt:** I see. Well, Tsai International certainly has an interesting history. Perhaps now, if you don't mind, we could talk about how we might be able to do business together.
**Miss Loi:** You have nothing to add?
**Mr. Holt:** About us? Not really. As you know, we're a pretty young company, nothing like Tsai.
**Miss Li:** Well, then, as you say, we can talk about doing business. With your permission, we might begin by describing for you our organizational

structure and how it reflects our company principles. And then perhaps you could do the same.

**Mr. Holt:** I see. And then we can talk about specific terms?

**Miss Li:** Terms?

**Mr. Holt:** You know, some of the basics.

**Dialogue1**

**Explanation: Uncertainty Avoidance**

Americans take many risks -- "let the chips fall where they may." Most French people would rather know where the chips are going to fall, how many, and what size. The people who settled the United States -- making a dangerous ocean voyage into a completely unknown future and later moving the frontier across the continent -- could handle uncertainty, and a streak of that attitude has survived in the American character. Americans like to experiment, to try something new, not because they are dissatisfied with what they have, but because they value the new for its own sake. Newer is better or, at least potentially better.

**Dialogue 2**

**Explanation: Individualism and Collectivism**

Notice how Ms. Walden zeroes in on Mr. Yamamoto, whereas Mr. Kaneda keeps talking about the team and the group, In Japan, one identifies very strongly with one's group; it is the group that achieves and the group that traditionally has been recognized (or it is the group which fails and is collectively held responsible.) Individuals think of themselves primarily in terms of their group and very much want to be seen as such, cooperating and working in harmony with other members of the team for the good of all. When there is a choice to be made, the needs and wishes of the individual are usually subordinated to those of the group (which, of course, looks after its individual members in return.)

Mr. Yamamoto would be mortified if he were singled out for some kind of recognition. He would not regard what he has done as a personal achievement (which it probably wasn't) and would be very worried about how the members of his team would feel about being overlooked. The solution, of course, is to give recognition to the entire accounting division, being extremely careful not to leave anyone out.

This is not to say there is no spirit of competition in Japan; there is a great deal of often fierce competition between groups. Nor do Japanese people lack individuality, They consider themselves infinitely individual but it is a sign of immaturity to seek to stand out from the group. Children soon learn that self-discipline and concern for the group are critical skills for success in school.

As a result of the collapse of the "bubble economy," some of these attitudes have begun to change. Some companies have introduced individual evaluation, though often that evaluation is based on the individual's ability to cooperate with and support the work group. Changing attitudes to evaluation are also contributing to a generation gap between older and younger employees.

**Dialogue 3**

**Explanation: Face (Confusion Dynamism and Collectivism)**
The issue here is what is known as 'face" -- and the need to save it for oneself and for others. Face means the image one presents to the world, including one' s reputation. Naturally on e wants one's image or reputation to be as positive as possible. Face is closely linked to the notion of self-esteem and self-worth, and if at all possible one does not want to lose one's face, especially not in public. However, since people also identify strongly with their groups, one also wants to preserver the face of others. In saving their face, one saves one's own face.

In this example, a potentially embarrassing (or face-losing) thing has happened -- someone has evidently lost a claim form. Ms. Harris, not schooled in the matter of face, is just trying to find out what happened to her form, while causing Miss Chen increasingly exquisite agonies of humiliation. Because she doesn't understand, Ms. Harris misses all three of Miss Chen's hints that this matter is most embarrassing and should be dropped.

The first hint is when Miss Chen says, " No, not just yet." For Miss Chen to disappoint customer like this, it have to admit that a certain service has not been rendered, is humiliation, So much so, in face, that Miss Chen now fully expects the inquiry to stop before any more damage is done.

But it doesn't. Not picking up on Miss Chen's embarrassment, Ms. Harris now asks how long it normally takes to process a claim. Miss Chen, forced to go on. Says, "No longer than two weeks," signaling to Ms. Harris a second time that something has gone wring (Miss Chen knows full well how much time has passed) and that Ms. Harris should stop, But she again misses the hint and says, "But it's been four weeks."

Miss Chen, very upset (but perhaps laughing t cover her embarrassment), now abandons subtlety and admits something is wrong -- "This is unusual" -- convinced that now the interrogation will end. But Ms. Harris now exceeds all bounds and suggests the claim is lost Miss Chen, to save her own face and that of the people she works with, can't possibly admit this of course, So she doesn't. "It can't be lost," she says, capturing the essence of face in this response, She doesn't day it *isn't* lost (which it is), but that it *can't* be lost, for that would mean a loss of face for everyone and is intolerable.

This exchange doesn't not mean that mistakes are overlooked and that no one is ever criticized in Chinese business culture. Instead, such criticism is normally expressed indirectly and in such a way as to avoid public shame, Such indirect communication is very powerful I shaping behaviors in China; unfortunately, it is overlooked by most Western business people who favor direct and unambiguous statements of cause and effect.

**Dialogue 4**

**Explanation: Face (Collectivism/Indirect and Direct Communication)**

Throughout much of the Middle East, honor is a central virtue, and shame (the public loss of face) is the ultimate humiliation. Criticism therefore has to be handled with extreme delicacy - avoided whenever possible and, if it cannot be avoided, expressed with the utmost discretion and indirection. Everyone is part of a social group and one's face within the group is an individual's most important possession.

For his part, Mr. Cole is actually quite pleased with Khalil's overall performance, except for one or two areas which he thinks khalil can improve. He tells Khalil about them because he wants Khalil to improve himself. (We will assume Mr. Coyle's motives are entirely positive and intended to support his employee.) But, to Khalil, such a direct statement of his deficiencies can only mean that Mr. Coyle is very disappointed. Khalil naturally assumes that Mr. Coyle is trying to be as sensitive as possible to Khalil's honor. If this is the best Mr. Coyle can do then Khalil must conclude that his performance has been very poor.

How should Mr. Coyle have handled the matter? Mr. Coyle's proportions are off. He should have spent most of the interview praising Khalil lavishly and then mentioned any problems briefly in passing at the end. Even then, Khalil would have been very sensitive to the criticism but, his honor having been preserved, he would have been more receptive to Mr. Coyle's comments.

Failure is something to avoid because it damages the relationships between people -- and relationships are the basis of personal identity and social power.

**Dialogue 5**

**Explanation: Power Distance / Ascription *vs.* Achievement**
Ms. Porter assumes the CEO will know something about the textile business, that one's knowledge and expertise - one's experience -- are part of what qualify someone for a job. But that is not the case in many cultures, particularly at the top levels of many companies. What matters is who Dr. de Leon is, not what he knows. In a culture with a strong class system, the most important qualification for an executive position is one's personal background.

Mr. Domingo makes this clear from the very beginning when he mentions Dr. de Leon's distinguished family name. The right name guarantees access to the top of the social structure, and access is power. Dr. de Leon is someone of substance and an excellent representative for the company.

But Ms. Porter, having just been told, now asks: "Who is he?" Mr. Domingo, no doubt taken aback, elaborates about the family to give her more information about Dr. de Leon's value to the company. Once again, Ms. Porter asks the question he has just answered: "But what's his background?" And so on.

In cultures with high power distance, society is highly stratified and the classes cohere strongly together. Thus, people from the top of society often go to a few elite schools, know one another well, and work

effectively together, People farther down the social scale may be uncomfortable when they are expected to cross class lines and interact with social superiors as equals. They are proud of their own skills which are different (often more technical) than those of their managers. They expect their managers to do their part and provide vision and leadership. Such vision and leadership are expected to come naturally to those at the top of the society and don't require a technical background.

Under NAFTA and the maquiladora system, these attitudes are changing but the tendencies remain.

**Dialogue 6**

**Explanation: Collectivism and Confucian Dynamism**
Many Asians influenced by Confucianism believe the most important unit is the group, not the individual. In cultures where the group is paramount -- the family, one's classmates, the work group -- harmony becomes an essential value and consensus decision-making is the rule. (The Japanese will tell you that this cultural value is rooted in the traditions of rice cultivation.)

Jenny is from the United States where majority agreement is sufficient for making decisions. She finds it hard to believe that the proposal was not voted on and passed if everyone in the meeting except Mr. Takeda agreed with it. But Tomoko feels that I f MR. Takeda doesn't agree -- and he would have expressed his reservations very quietly and probably before rather that during the meeting -- then passing the proposal would have upset Mr. Takeda and upset the harmony of the group. Damaging group harmony is a much more serious matter than the outcome of any single vote.

The Japanese *ringi* system requires everyone -- at all levels of an organization -- to review and sign off on plans. Criticism is indirect (and often through third parties) but the process identifies most of the problems in a plan. Therefore, the system adds a great deal of time to decision-making but leads to smooth implementation once a decision has been taken.

By contrast, Americans find it hard to identify with consensus decision-making, not only because of their individualism but because it takes so much "extra time." For Americans, time is money. They often forget that, although 51% of the people initially accept the decision, the other 49% do not and have to be encouraged to support it. In the end, the biggest difference between Japanese and American decision-making may be that the Japanese do their consensus building first and Americans do it later. Both processes take about the same time.

**Dialogue 7**

**Explanation: Confucian Dynamism (Collectivism and Indirect Communication)**
Ms. Young hasn't learned that the Japanese "yes" can only be appreciated in the context of the Japanese "no" which, for all practical purposes, doesn't exist. No one is to be publicly embarrassed or humiliated in Japan. Because saying no or even implying displeasure or

disappointment risks humiliating the other party, direct negative statements are avoided. Needless to say, in a world where you must never say no, yes gets quite a workout.

Instead of the offensive no, the Japanese have devised a number of ways of not quite saying yes. Among these are: 1) to ask a question; 2) to say they don't understand; 3) to change the subject; 4) to say that they can't answer at this time; 5) to give a conditional yes; 6) to say that the question is very difficult; and 7) to claim that this question is not within their authority to answer. To another Japanese, not saying yes means no.

In the present case, Mr. Kawabata doesn't want to embarrass Ms. Young by refusing her price outright, so he mekes what for him is an exceedingly unenthusiastic response -- "That's a good price." He fully expects Ms. Young to take this for the lukewarm answer that it is. Ms. Young, of course, assumes that a good price is just that. But she does check to make sure -- "So you accept the price?" The answer -- " It's very good" -- is as close to an outright no as Mr. Kawabata dares come but for Ms. Young it is and affirmation.

So how does a Western business person know when the Japanese are just being polite and when they have actually accepted an offer? It is not difficult. If they have accepted and offer, then the conversation shifts naturally to a discussion of the implementation details. Conversely, if they have not accepted the offer and a Westerner tries to discuss such details, the Japanese will come back to the unresolved issue at hand.

**Dialogue 8**

**Explanation: Power Distance**
Ms. Thompson has a poorly developed appreciation of rank and status. This is a division chief's meeting in England. People form the shop floor (in this case, floor managers) is not used to being invited to division chief's meetings -- and the division chiefs are not used to seeing them there. Neither is comfortable in the others' presence. It would be quite appropriate and normal for a division chief to consult with a floor manage one-on-one or to meet personally with all the floor managers but not to mix the two groups at the same meeting. In al likelihood, the floor managers do have something to report but are uncomfortable about being invited to this particular meeting. They say they have nothing to report rather then refuse Ms. Thompson's invitation.

The division between rank and file and middle management exists in America too but is not as wide. The chain of command is less sacrosanct and the hierarchy can be bypassed whenever it is more efficient to do so.

Contrast both situations with Germany where society is strongly structured yet egalitarian. Each class has its area of expertise and expects to be recognized for it. The failure of Rover's unionized labour to solve its own production problems led to immense frustration at BMW.

**Dialogue 9**

**Explanation: Collectivism and Confucian Dynamism**
Americans see an interview as an exercise in persuasion. If you don't sing your praises of or at least point out your strengths, then you either aren't interested in or qualified for the position or contract. If you don't make your case, how can the interviewer know that you're qualified?

In Japan, an interview is often just a formality -- the occasion to validate a decision that has already been made or to verify that the person selected doesn't have homicidal tendencies! Frequently, you do not get to the interview stage unless it has already been determined -- through third partied -- that you are essentially fit for the job. And when you do get to the interview, protocol (modesty) requires that you understate your qualifications and accomplishments. It is not proper to praise yourself (or to put down the competition.)

In this case, Mr. Ohmae is getting increasingly uncomfortable as Ms. Thomas pressures him to praise himself. By contrast, from her point of view, as Mr. Ohmae resists her openings, she begins to wonder if he wants the job or is capable of it. The most significant part of the dialogue is when Me. Ohmae asks Ms. Thomas if she has talked to Mr. Mizawa. If she has -- and Mizawa-san has done his job properly -- then Ms. Thomas will have been filled in on all of Mr. Ohmae's achievements and capabilities. Therefore, Ms. Thomas's request for an interview should mean she is satisfied from Mr. Mizawa that Mr. Ohmae is completely qualified. To press Mr. Ohmae for further details suggests that Mr. Mizawa did not convince Ms. Thomas and that she is now trying to find out this information on her own.

**Dialogue 10**

**Explanation: Collectivism and Individualism**
Miss Li's company is looking for a business partner -- a company with which they will ever into a long-term relationship that will bring many years of profit to both. Because a great deal of time, money, and effort will be committed to this relationship (if it is to work,) the Chinese want to be satisfied about the essential integrity and compatibility of their prospective partner.

What is the history of the company and its corporate philosophy? What was the vision of the people who founded it? What are its guiding principles, its organizational approach, and its key policies? In short, can this relationship last? Depending on the answers to these questions, Miss Li and her colleagues will know the prospects for the solid, enduring, relationship they seek. To the Chinese, these rather abstract issues are the essential foundation for any kind of agreement -- what they would call "the basics."

Naturally, it is a bit unsettling for Miss Li when Mr. Holt doesn't reciprocate with a history of his company (however young it may be) and seems anxious to skip over the important questions and move to minor details. Are they hiding something? Why don't they ask more questions on their own?

But Mr. Holt has something else in mind here. He is looking for short-term profits, not a long-term relationship. From his point of view, the partnership needs to endure only long enough for his company to recoup its investment and make some profit. To this end, the vision of Tsai International is irrelevant. It is not that Mr. Holt is against a long-term relationship; he just sees it as a possible outcome of the immediate short-term opportunity.

Nor are the Chinese uninterested in short-term profit. However, they feel about it much as Mr. Holt feels about a long-term relationship. If it should happen, so much the better, but it is not the immediate objective. While Americans believe in seizing opportunities now; the Chinese believe in creating them.

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# Exercise 2: Analysis of Cultural Dimensions *vs.* User-Interface Design Components

**Exercise Format**

Participants will divide into groups to explore possible design implications of each of Hofstede's five culture dimensions on one of five user-interface components. Consider ways culture might affect the component, *e.g.*, a training user interface for a highly individualist culture might emphasize competition and present information using the metaphors of a game. Be prepared to present your ideas to the tutorial participants.

| | Metaphor | Mental Model | Navigation | Interaction | Appearance |
|---|---|---|---|---|---|
| **Power Distance** | | | | | |
| **Individualism/ Collectivism** | | | | | |
| **Masculinity/ Femininity** | | | | | |
| **Uncertainty Avoidance** | | | | | |
| **Confucian Dynamism** | | | | | |

## User Interface Design Components

Demographics, experience, education, and roles in organizations of work or leisure can define users. Individual needs as well as group roles can define a user's tasks. A user-centered, task-oriented design method accounts for these aspects in effective user-interface design. User interfaces conceptually consist of metaphors, mental models, navigation, appearance, and interaction, For simplicity, clarity and consistency with the reader's interpretation, these terms are defined as follow: [Marcus, 1992; Marcus, 1995; Marcus, 1997; Marcus, 1998]:

**Metaphors**

Essential concepts conveyed through words and images, or through acoustic or tactile means. Metaphors concern both over-arching concepts as well as individual items, like the "trashcan" standing for "deletion" within the "desktop" metaphor.

**Mental Models**

Organization of data, functions, tasks, roles, and people in groups at work or play. The term, similar to, but distinct from cognitive models, task models, user models, *etc.*, is intended to convey the organization observed in the user interface itself, which is presumably learned and understood by users and which reflects the content to be conveyed as well as users' tasks.

**Navigation**

Movement through mental models afforded by windows, menus, dialogue areas, control panels, etc. The term implies process, as opposed to structure, *i.e.*, sequences of content potentially accessed by users, as opposed to the static structure of that content.

**Appearance**

Verbal, visual, acoustic, and tactile perceptual characteristics of the displays. The term implies all aspects of visual, acoustic, and haptic languages, *e.g.*, typography or color; musical timbre or cultural accent within a spoken language; and surface texture or resistance to force. For the purposes of this exercise, one group may consider textual appearance and style; a second may look at graphic, acoustic, and haptic appearance and style.

**Interaction**

The means by which users input changes to the system and the feedback supplied by the system. The term implies all aspects of command- control devices, *e.g.*, keyboards, mice, joysticks, microphones, as well as sensory feedback, *e.g.*, changes of state of virtual graphical buttons, auditory displays, and tactile surfaces.

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# Exercise 3: Culture-Oriented Web User-Interface Design

**Overview**
Participants will divide into equal groups. Each team will receive an assigned description of target cultures. Participants will analyze the target culture description for aspects that may impact product acceptance, then assemble a Web home page design that the team feels would be suitable for the target culture. Participants will be asked to explain separately any behavioral aspects that they feel should be implemented to match expectations in the primary target culture.

All participants will work on the same kind of Website, namely, a government Website for health-related social services, such as that providing information about women's health, infectious or communicable diseases, etc. The Website must be directed to citizens of the country assigned to each group. The countries will be assigned during the tutorial. Information will be provided to each group about their assigned country's cultural markers (e.g., the flag) and other information about the country (e.g., demographics, typical cultural attributes, etc.).

As with all exercises, the presenter(s) will roam among the teams, offering encouragement, making suggestions, and making notes as part of the later critique. Each team will report to the group lessons learned.

**Specifications**
Use pen and paper to write/draw the designs. Color pens may be used as an optional additional implement. Keep in mind the user interface design comments discussed earlier in the tutorial (metaphors, mental models, navigation, appearance and interaction). Then, discuss within your team why each design decision was made, how it is related to presumptions about the target culture, and what (if any) behavioral expectations your team has of users as they encounter the user-interface that you have devised. Take notes of these things, and be ready to discuss them with the class.

**Site Mission Statement**
The site your team is designing is meant to provide detailed information to users in the target culture regarding government services and regulations that may impact their personal as well as professional activities. You should assume for this exercise that users from other cultures are *not* taken into account. Therefore, the site you are designing should be specific to the “home culture” of use as possible. See the additional information below for a classic/general description of target cultures. The descriptions are all based upon and/or, related to Hofstede’s work cited below.

**Cultural Groupings**
These descriptions are based on Jordan’s work cited below.

| | |
|---|---|
| **Democrats** | Tough, short-term oriented cultures in which there is a very strong emphasis on individual expression. People in these cultures tend to be comfortable with uncertainty and have less respect for authority.<br><br>Countries include: Australia, Canada, Ireland (Republic), New Zealand, South Africa, United Kingdom, United States of America. |
| **Meritocrats** | Tend to be uncomfortable with uncertainty and put less emphasis on individuality than do Democrats. Otherwise, the values are similar to those in Democratic cultures.<br><br>Countries include: Austria, Germany (Federal Republic), Israel, Italy, Switzerland. |
| **Egalitarians** | Extremely tender cultures, with less pressure to 'get ahead.' Otherwise, similar to Democratic cultures.<br><br>Countries include: Denmark, Finland, Netherlands (The), Norway, Sweden. |
| **Supportives** | Tender cultures that are very uncomfortable with uncertainty. These cultures have respect for authority and are not particularly individualistic.<br><br>Countries include: Belgium, France, Portugal, Spain. |
| **Libertarians** | Tough, collectivist cultures with less respect for authority. These cultures are comfortable with uncertainty and people are encouraged to succeed on their own terms.<br><br>Countries include: Jamaica. |
| **Planners** | Very tough, very future oriented cultures, with a strong dislike of uncertainty. Moderately collectivist with a moderate respect for authority.<br><br>Countries include: Japan. |
| **Collectivists** | Very collectivist with much respect for authority. Future oriented and uncomfortable with uncertainty. Not much pressure to "get ahead."<br><br>Countries include: Arab Countries, Argentina, Brazil, Chile, Columbia, Costa Rica, East Africa, Equador, Greece, Guatemala, Iran, Mexico, Pakistan, Panama, Peru, Salvador (El), South Korea, Taiwan, Thailand, Turkey, Uruguay, Venezuela, Yugoslavia . |
| **Authoritarians** | Very high respect for authority. These are collectivists cultures with moderate toughness. Moderately future oriented and comfortable with uncertainty. |

Countries include: Hong Kong, India, Indonesia, Malaysia, Philippines, Singapore, West Africa.

These following descriptions are based on Scarborough's work cited at the end of this paper.

**Target Culture 1: Japan**

**The core values developed by primary forces that shaped Japanese culture include:**

- **Collectivism:** encouraged by an island nation; a sense of uniqueness and difference from others; concern about deprivation, invasion, and disaster; rice culture; a strong class system; Shinto-based nationalism, and Confucian teachings regarding the value of order and duty and obligations to others.
- **Harmony:** Encouraged by a powerful sense of collectivism, but also a resultant of Confucian reaching regarding the need for social order and of crowded living conditions, which demand politeness and consideration.
- **High-context Communications:** Necessary to maintain harmony but also caused by an hierarchical power structure and facilitated by homogeneity of culture and commonality of values and experience.
- **Hierarchy:** Status accorded through hereditary ascription, a result of a long entrenched agrarian class system; Shinto-based respect for elders and heroic figures; Confucian teachings regarding the appropriateness of centralized power; and long-lived feudalism.
- **Strong Uncertainty Avoidance:** Atypical of Asian cultures, due to historic geographical/political isolation and concern about external threat, the comfortable familiarity of ethnic homogeneity, and the pervasive tradition of *kata*.

**Target Culture 2: China**

**The core values developed by primary forces that shaped Chinese culture include:**

- **Large Power Distance:** Resultant of Confucianism, amplified by legalism and continuous strong, centralized political orders. Fatalism resultant of cosmological subjugation to nature (*feng shui*), Taoist teaching, Confucian disdain of science, and personal powerlessness throughout millennia of powerful central governments.
- **Collectivism:** Centered on the family. Derived from communal ownership, agricultural roots, the need for unity against hardship, immobility, and Buddhist attitudes toward individualism.
- **Strong Uncertainty Avoidance:** Caused by a Confucian emphasis on order, ritual behavior, predictability, and the value of tradition.
  **Masculinity/Femininity:** Balanced between Confucian emphasis on achievement and patriarchy on one hand and the importance of maintaining relationships on the other.

**Target Culture 3: Arab Culture**

**The core values developed by primary forces that shaped Arab culture include:**

- **Large Power Distance:** A vestige of a long history of authoritarian rule, a bipolar, two-class social system, and the intense, pervading discipline of Islam.
- **Collectivism:** Grounded in ancient traditions of tribal loyalty and the prevalence of the extended family as the primary social and economic unit.
- **Individualism:** Idealized in the nomadic, Bedouin life-style.
- **Strong Masculinity:** Emphasis on traditional gender roles resulting from chivalric romanticism that reduces the female to secondary role. Masculinity allows for hospitality and acceptance of other Muslims.
- **Moderate Uncertainty Avoidance:** Confidence in the support of Allah to guide decisions and actions partially offsets strong inhibitions posed by the perceived dominance of man by Allah and Nature.

**Target Culture 4: India**

**The core values developed by primary forces that shaped Indian culture include:**

- **Large Power Distance:** Institutionalized by the caste system and rationalized as *karma* (fate/destiny/person's aura or atmosphere).
- **Collectivism:** Necessitated by the extended family, clan, and village structure typical of agrarian roots, especially a wet-rice culture, and amplified by the need to maintain harmonious relationships within and between castes.
- **Individualism:** Necessitated by the need to compete for scarce resources, encouraged by religious imperatives for individual responsibility, and amplified by the extended British example.
- **Strong Masculinity:** Separation of traditional gender roles, amplified by aggressiveness required to ensure survival in the face of scarcity.
- **Weak Uncertainty Avoidance:** A result of Hindu beliefs in a universe in constant flux, *karma*, submission to the will of gods and nature, the lack of ethical absolutism, and the ability to rely upon hierarchical guidance in anomalous situations.

**Target Culture 5: Mexico**

**The core values developed by primary forces that shaped Mexican culture include:**

- **Large Power Distance:** Strong hierarchies derived from the centralized, vertical power structures of the Aztec class system, by Spanish military power and social class ranking, by the bureaucratic Church on which the Mexicans came to depend for meaning in their lives, and by the patriarchal family typical of agrarian societies.
- **Strong Collectivism:** Centered in the highly extended, agricultural family, and grounded in interdependence engendered by harsh conditions. Ascribed status often based on military power and cultural factors attributable to the Spanish, who replaced the Aztec meritocracy.
- **Emergent Individualism:** Due primarily to the influence of the United States in recent centuries.
- **Strong Masculinity:** In terms of traditional gender roles, aggressiveness and competitiveness are driven by Aztec militarism and meritocracy, Spanish-Arab machismo and romanticism, the effort

required to survive harsh conditions, and, more recently, by the example and economic necessities created by the United States.

**Target Culture 6: Russia**

**The core values developed by primary forces that shaped Russian culture include:**

- **Large Power Distance:** Resulting from more than 1,200 years of strong, autocratic rule and from the Orthodox faith, which teaches and venerates submission to authority.
- **Strong Collectivism:** A result of a tradition of communal self-government with an ethic of equality in sharing scarce resources in addition to the necessity of mutual interdependence for protection against a hostile environment, omnipotent rulers, and foreign invaders.
- **Universalist ethics**: stem from the absolutism of Orthodox dogma and the unifying fraternal, egalitarian sentiments of nationalism.
- **Individualism:** Individualism and high-context communications are results of the survival instinct and a reaction to prolonged suppression of free expression.
- **Femininity:** Resulting from the mutual interdependence required to cope with a hostile physical environment and political oppression, which made essential the cultivation and maintenance of close personal relationships.

**Target Culture 7: Western Europe**

**The core values developed by primary forces that shaped Western European culture include:**

- **Individualism:** Europeans are individualistic but with some qualifications. Southern Europeans, given relatively late industrialization, still rely heavily on the support of the same extended families and personal networks seen in many non-Western, less-industrialized cultures, The French, although highly egalitarian and democratic, feel a very strong sense of patriotism and national unity arising from their central role in shaping European history and culture.
- **Power Distance:** Latin countries have larger power distances than the United States, Scandinavian, or North European countries, reflecting the more autocratic, top-down, and paternalistic management style found in countries with a long history of strong central rule, social stratification, and largely agrarian economies.
- **Uncertainty Avoidance:** The dimension with greatest variability. It is strong in the more fatalistic Catholic countries, all of which have a long history of obedience to Rome. It is weakest in those countries most remote from Rome.
- **Masculinity:** Europeans cultures are generally masculine; the strongest evidence being a strong achievement orientation, especially among Germanic cultures that have traditionally selected their leaders primarily on merit.

**Target Culture 8: Sub-Saharan Africa**

**The core values developed by primary forces that shaped Sub-Saharan African culture include:**

- **Large Power Distance:** Stemming from recognition of and submission to the authority of age-based wisdom and experience, essential in an agrarian, subsistence economy; amplified by the emergence of authoritarian monarchies and confirmed by the relatively brief colonial experience and the statist influence of European powers.
- **Collectivism:** Based on the extended family as the primary collective unit; essential for survival in a demanding environment poor in resources and supporting only small, widely dispersed, communities. Egalitarianism reflects mutual dependence and respect for each individual as a vehicle for nature's life force and the kinship lineage.
- **Femininity:** Associated with maintaining harmonious relationships within the collective unit and with attempts to temper supernatural and natural forces.
- **Low Uncertainty Avoidance:** A result of fatalistic dependence on the supernatural and nature, with its unpredictable events and cyclical rhythms of constant change.

**References**

Hofstede, G. (1997). *Cultures and Organizations: Software of the Mind.* New York: McGraw-Hill.

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AM+A White Paper:

# A Practical Set of Culture Dimensions for Global User-Interface Development

1 January 2004

**Contents**

## Abstract

User-interface design is influenced by cultural differences. Cultures around the world have different patterns of social behavior and interaction that have led anthropologists and scientists of communication to develop culture models whose dimensions describe these differences. This paper describes an effort to collect expert opinion about these cultural dimensions and how they influence user-interface design. The goal was to determine the most important dimensions. Data collected from over 50 experts in the field of user-interface design are presented in this survey. This paper is an edited extract of a much longer thesis by one of the authors [Baumgartner].

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# Introduction

People from different countries/cultures use user-interfaces (UIs) in different ways, prefer different graphical layouts, and have different expectations and patterns in behavior. Therefore user-interfaces must be adapted to the needs of different locales to provide an optimum user experience.

Localization, for example of Web sites or software applications, includes changing metaphors, mental models, navigation, interaction, and appearance [Marcus, 22ff). Much research is done on the topic of localization regarding technical approaches (*e.g.* display different character sets, multi-language handling, and memory-based translation software). To facilitate the work of translators and multi-language site providers, content management systems (CMS) were invented that support different cultures, but only regarding text and translation. In fact, current CMS are not really able to handle most other aspects of content and therefore cultural differences automatically, especially regarding graphical appearance. Today, if a company or organization decides to adapt a UI to a certain culture, much time and money must be spent to accomplish this task well: besides all the terminology/measurement changes and translation, one must hire cultural experts for all the targeted countries to account for all UI-component changes. Nielsen [Nielsen, 1996] admits that international usability engineering is a challenging and often avoided area because of the many issues that have to be covered when one wants to serve an international audience. [Nielsen, Engineering, 1)

To facilitate and lower the costs of localizing, the development of a CMS that could handle the expanded requirements of localization would be helpful. To support an eventual development of such a CMS, it is desirable to identify the most important dimensions of culture regarding UI development. This idea is based on the work Marcus has done using Geert Hofstede's cultural dimensions and applying them to the field of UI design [Marcus and Gould]. This current research goes further and seeks to find out if Hofstede's dimensions, or others, are appropriate to use for culture-oriented evaluation of UIs.

Many researchers in the field of anthropology have studied patterns of behavior and thinking that differentiate one culture from another. Some of them have compiled these patterns into culture models. To gather expert opinions about which of the dimensions of these models are important when localizing UIs, a set of dimensions extracted from primary references were presented to experts in the form of a questionnaire. The experts were asked to rank the dimensions according to their perceptions of importance. The outcome of the ranking is the basis of an analysis about which dimensions are important for the field of UI design

and why they are important. Clearly, which dimensions are the most important can be controversial. Nearly every participant made statements pointing to this controversy: everything depends on the purpose of the UI and the locale itself. Nevertheless, the goal was to derive a concrete result that provides a basis for further discussion.

# Culture Dimensions and User-Interface Design

The meaning of the term *culture* is complex and used in different ways among many professions. One of the many definitions found in the *Merriam-Webster OnLine Dictionary* is the following: Culture is "the set of shared attitudes, values, goals, and practices …" (Webster, online). Del Galdo adds: "In addition, culture can also be affected by nationality, language, history, and level of technical development." [del Galdo, 78]. We can use categories to differentiate one culture or country from others. *Dimensions of culture* are "…categories that organize cultural data." (Hoft, Developing, 41) "The notion of cultural dimensions originated in cross-cultural communication research done by Edward Hall and Florence Kluckhohn and Fred L. Strodtbeck in the 1950s." [Gould *et al*, 3]. Many anthropologists have done research in the field of cultural dimensions. One of the most cited studies is that by Geert Hofstede. In the 1970s and 80s he did a survey at IBM that "dealt mainly with the employees' personal *values* related to work situation…" Within this study he covered 72 national subsidiaries, 38 occupations, 20 languages, all in all about 116,000 people. [Hofstede, Cultures, 251]. Based on this survey he came up with five dimensions of culture. Other anthropologists and communication scientists also did studies or academic research to determine different cultural dimensions.

This present study derives from the work of one co-author (Marcus). Marcus combined the scheme of Hofstede's five cultural dimensions and the scheme of five UI design components to create a five-by-five matrix that allows for 25 fields of interest. An article by Marcus and Gould [Marcus and Gould] points out possible implications of Hofstede's dimensions for UI components. During an internship at Marcus' firm, Baumgartner was involved in a study that attempted to find out if these assumptions match with "real life": *i.e.*, can examples be found in localized Web sites? For this analysis, we attempted to be generally inclusive under constraints of time and chose reasonably complex, different "B2B" and "B2C" Websites from three different continents (North America, Europe, and Asia). The exact circumstances of each Web site design could not be determined; however, we examined evidence from the sites themselves. The results of this study, presented at IWIPS03 [Marcus and Baumgartner] are the following: (1) The matrix-oriented method helps to organize and analyze data collection and (2) initial observations suggest that cultural habits run deeply and operate even under constraints of global design specifications. In high individualistic and low power-distance countries, variations from standard practice seem likely to be most frequently observed.

This study sought to determine which dimensions might be most useful in mapping culture dimensions to UI components. The following authors were selected by informal polling of a limited number of initial experts regarding primary resources. Their works are cited in the References and are commented upon more completely in Baumgartner's thesis [Baumgartner].

| | | |
|---|---|---|
| Adler, Nancy J. | Kluckhohn, F. R. | Victor, David A. |
| Condon, John C. | Parsons, Talcott | Wright, Quincy |
| Hall, Edward T. | Strodtbeck, Fred | Yousef, Fathi S. |
| Hofstede, Geert | Trompenaars, Fons | |

As Hoft describes cultural dimensions, they can be divided into two categories: objective and subjective. Objective categories are "easy-to-research cultural differences like political and economic contexts, text directions in writing systems, and differences in the way that you format the time of day, dates, and numbers." Subjective categories cover information "…like value systems, behavioral systems, and intellectual systems…" [Hoft, 41- 42].

This study focuses on subjective categories, because objective categories are easy to extract from a culture, and localization approaches already cover these dimensions. Nevertheless some dimensions that seem to be objective at first (economical progress, or resources a country owns) also are of interest. These dimensions are included for two reasons: (1) the objective categories included in this survey are not yet covered by "normal" localization methods and (2) it was of interested to see if there would be a significant difference in the rating of objective and subjective categories (which turned out to be true). The following are the dimensions used in the survey derived from these sources. A complete description of each, including background, examples, the relation to UI components, and comments from evaluators that were collected appear in the thesis [Baumgartner]. Space does not allow for further elaboration.

| | | |
|---|---|---|
| Achievement vs. ascription | Human nature orientation | Property |
| Activity orientation | Individualismvs.collectivism | Resources |
| Affective vs. neutral | Instrumental vs. expressive | Space |
| Authority conception | Internal vs.external control | Specific vs. diffuse |
| Context | Internationaltrade,commun | Technological dev. |
| Degree of power | Long-vs.short-time orient. | Time orientation |

| | | |
|---|---|---|
| Economic progress | Meaning of life | Time perception |
| Experience of technology | Nonverbal communication | Uncertainty avoidance |
| Face-saving | Political decentralization | Universal vs.particularism |
| Gender roles | Power distance | |

The experts used in the survey included, among others, the following:

| | | |
|---|---|---|
| Adelman, Denny | Hugo, Jacques | Robinowitz, Christina J. |
| Amend, Sabine | Jettmar, Eva | Schlatter, Tania |
| Begley, Suzanne | Kalbach, James | Scholts, Stijn |
| Beu, Andreas | Khan, Zayera | Schutz, Bart |
| Bonnaudet, Jean-Marc | Knapheide, Claus | Scott, Josephine |
| Campbell, Tanya | Kumar, Ripul | Sheridan, E.F. |
| Chen, Eugene | Laurel, Brenda | Simlinger, Peter |
| Cole, Melissa | Lee, Junghwa | Simons, George |
| Deaton, Mary | Marcus, Aaron | Southerton, Laurie |
| El Said, Ghada Refaat | Martlage, Aaron | Stamboulie, Mary |
| Epstein, Andre | Massey, Anne | Sturm, Christian |
| Gargeshwari, Malinirao | McAllister, Pamela | Vöhringer-Kuhnt, Thomas |
| Gould, Emilie | Meek, Amanda | Wright, Matthew |
| Guan, Larry | Mitra, Romit | Yankee, Everyl |
| Hedges, Andrew | Müller-Prove, Matthias | Yunker, John |
| Hidasi, Judit | Nowell, Jessica | Zimmermann, Claus |
| Hoffmann, Anja | Paulsen, Susan | |
| Hoplaros, Costas | Penn, Dick | |

# Survey, Results, and Ideas for Practical Use

After studying the described 29 dimensions by nine authors, a questionnaire was compiled that described the dimensions briefly. This questionnaire became a tool to get expert opinion quickly and in a structured form. Although the questionnaire might appear like one produced for a quantitative study (use of a Likert Scale), the real purpose was to get ideas about thinking directions of UI designers and analysts, which were obtained through an online questionnaire. The questionnaire gained background information about the participants, presented brief descriptions of each dimension and the rating system, listed the dimensions to be rated, and provided fields for extra comments by participants. To find out if the structure of the questionnaire was appropriate and the estimated time to fill out the form was correct, a pretest was conducted with a group of UI design students at the Fachhochschule Joanneum, Graz, Austria. In order to get valuable input for the survey, experts were contacted in four ways: research within specialized literature to find expert's names combined with Internet research for email addresses, mailing lists in the field of UI design and cultural matters, relevant companies, and relevant conference. Regarding feedback, personal contact and contact via expert mailing lists were the most efficient and effective.

The objective for the survey was to get 30 expert opinions. By the deadline for the survey 57 experts had completed the questionnaire. The participants are from 21 different countries across the world (Australia, Austria, Belgium, Canada, China, Cyprus, Egypt, France, Germany, Hungary, India, Japan, Mexico, Netherlands, Pakistan, Scotland, South Africa, Switzerland, Sweden, UK, and the United States). 19 respondees work in a different country from which they were born (and raised) in. Approximately 43% of the participants originally came from North America and 39% form Europe. They currently work in North America (47%) and Europe (37%). Regarding the participants experience in the field of UI design, 27 had 3-7 years and 14 had 7-11 years of experience. The participants are from more than 40 different institutions including global companies (e.g. Siemens, Peoplesoft, and Ogilvy), universities (Kanda University of International Studies, Stanford University, The George Washington University) and many smaller, specialized companies.

The expert's comments on the survey were positive. Many mentioned that the set of 29 dimensions itself would form a helpful tool in their

future work to understand cultural differences. The statement “None of them seemed unimportant” by one expert confirms this impression. However, at least three experts stated that these cultural dimensions do not really have influence on their daily work. This attitude seems ascribable to cultural ignorance, but this opinion must be validated through further research. As already stated, nearly everyone mentioned that “everything depends” on the purpose of the UI itself and the domain of the users. To analyze the data from a statistical point of view is risky; as stated earlier, the study is basically a qualitative one, not quantitative. Concepts like deviation and variance in the raw data are not very meaningful. Ordinal values must be considered instead of metrical. Thus we include a factor analysis, as shown in Figure 1.

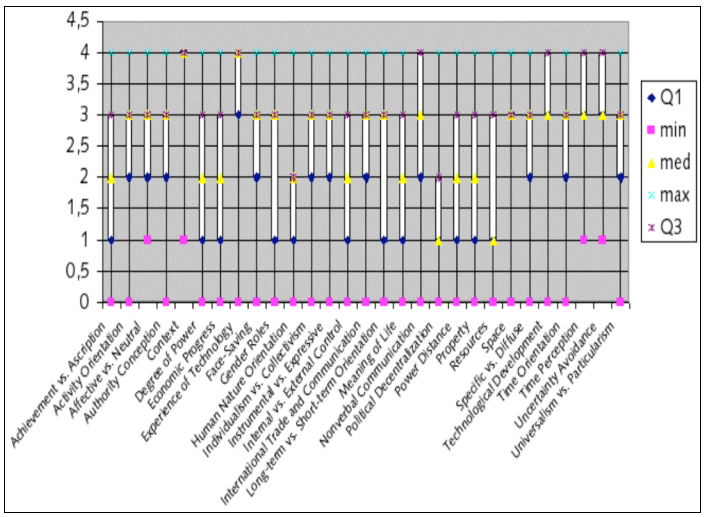



*Figure 1. Boxplot or whisker diagram of the data gained through the questionnaire*

The boxplot in Figure 1 tries to visualize the distribution of expert ratings. To analyze ordinal values, parameters like first quartile (Q1), third quartile (Q3), minimum (min), median (med), and maximum (max) are used. A boxplot provides a simple graphical summary of a set of data. It shows a measure of central location (the median), two measures of dispersion (the range and inter-quartile range), the skewness (from the orientation of the median relative to the quartiles) and potential outliers (marked individually). Boxplots are especially useful when comparing two or more sets of data. As stated previously, the survey was intended to deliver directions of thinking; it is not mainly a quantitative survey. The comments most of the participants offered were very valuable and gave insight into the expert’s mental models and experience. Nearly all participants pointed out that a general opinion on this topic is very hard to provide: “everything depends” was a very common comment.

Nevertheless, each of the participants provided a ranking of the dimensions.

To filter out the most important dimensions in a general sense, one draws a "line," which seems best after the dimension of *Authority Conception*. The statistical reasoning for this decision is the following: There are just five dimensions that are clearly located in the space between "very important" (4) and "important" (3): context, environment and technology, technological development, time perception, and uncertainty avoidance. As authority conception is, in the average, still very high and in the statistical ranking of the experts with more than five years of experience even at rank 5, it seemed reasonable to include this dimension in the top five dimensions. The following list summarizes the results for the most important culture dimensions [Baumgartner]:

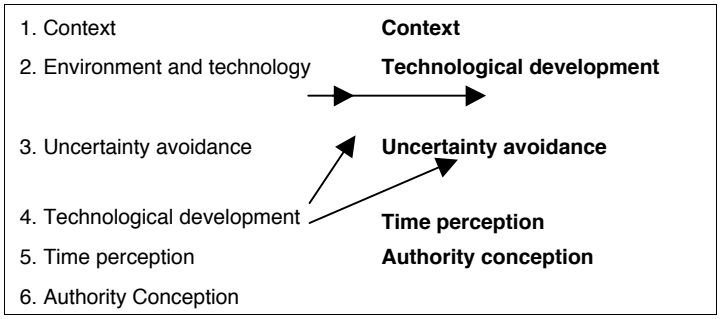



*Table 1: Ranking of the most important cultural dimensions*

The dimension of *Context* heads the ranking shown in Table 1. Described as "the amount and specificity of information in a given situation," this dimension has an average rating of 3.73 among all participants and an average of 3.79 among the participants that have more than 5 years of experience in UI design. Among the latter group nobody rated this dimension lower than 3 out of 4 possible grades. The second most important dimension is *Experience of technology*. It is proposed to combine this dimension with *Technological development,* which is rated on position four, and name this dimension Technological development. Both dimensions are rated as very important (3.30 and 3.18) for UI design and have to do with the development and attitude of the members of a certain society towards technological development. The dimension *Uncertainty avoidance* is number three on the list of important dimensions, with an average rating of 3.21 out of 4, and no one rated the dimension as unimportant. One can assume that nearly every UI must take into account the behavior of the user regarding uncertain or unknown situations. Time perception is also ranked among the top six, with an average ranking of 3.14. Again, no one considered this dimension as unimportant. *Authority conception* had an average of rating of 2.86. It is interesting that the concept of Power distance, which is very

similar, is statistically ranked only at position number 22. A very simple explanation of this contradiction could be the wording: Authority conception denotes with its name what this dimension is about; Power distance does not fulfill this need. One can also assume that the idea of how people think of authority heavily influences their behavior in handling a UI.

# Practical Use of the Set

One purpose of this project was to present ideas for how the findings of this survey might be used for practical work. As already stated, it is a very difficult venture to determine the most important dimensions for UI design in general. More research must be done to filter out which dimensions are the most important for special fields of UI design; for example, the design of medical instruments might demand different cultural emphases than a general telecommunication tool. Although it would be ideal if every localization project would take into account all 29 dimensions, this is not likely. Therefore, we provide a grouped and ranked list of dimensions:

| No. | Name |
|---|---|
| 1 | D05 Context |
| 2 | D25 Technological development, D08 Experience of technology |
| 3 | D28 Uncertainty avoidance |
| 4 | D27 Time perception |
| 5 | D27 Authority conception, D20 Power distance |
| 6 | D03 Affective vs. neutral |
| 7 | D09 Face-saving, D24 Specific vs. diffuse, D13 Instrumental vs. expressive |
| 8 | D02 Activity orientation, D17 Meaning of life |
| 9 | D18 Nonverbal communication, D23 Space |
| 10 | D12 Individualism vs. collectivism |
| 11 | D26 Time orientation, D16 Long-term vs. short-term orientation |
| 12 | D29 Universalism vs. particularism |
| 13 | D15 International trade and communication |
| 14 | D10 Gender roles |
| 15 | D01 Achievement vs. ascription |
| 16 | D21 Property |
| 17 | D07 Economic progress |
| 18 | D14 Internal vs. external control |
| 19 | D22 Resources |
| 20 | D06 Degree of power |
| 21 | D11 Human nature orientation |
| 22 | D19 Political decentralization |

The list above tries to give an overview of how the dimensions are related to each other and how they could be grouped together. Listed in the order of their statistical average (gained through the expert questionnaire) and grouped together (for reasons to be described later), they can form a practical tool to decide which dimension must be focused on in the next step to cover the most important differences.

When one thinks of a localization project, one may need to focus on the top six dimensions of the list. If, suddenly, more money is available for this part of the project and now the project manager must decide which dimension should be focused on next, the list offers a helpful decision support. Tying to group the dimensions above is a very difficult task. One requires more empirical studies about how cultural background influences UI design. Currently, most of the ideas on this issue are based on assumptions. There are still tests and studies to be done to provide valuable material. Nevertheless, we provide groupings and within the following paragraphs describe the reasons for the groupings. The groupings are based on the idea that the problems the UI designer face by paying attention to the dimension might awake similar thoughts and directions of thinking.

**Group 1**: D08 Experience of technology, D25 Technological development: These are clearly similar in relation to technology.

**Group 2**: D27 Authority conception, D20 Power distance: As Hoft [Hoft, online] describes these two dimensions as very similar. Although the two dimensions have not been ranked by the experts on similar levels, we can assume that cultural differences in this field have the same impact on UI design as they are so similar.

**Group 3**: D09 Face-saving, D24 Specific vs. diffuse, D13 Instrumental vs. expressive: all three dimensions cope with the problems of interpersonal relationships. The UI component influenced mainly by these dimensions is interaction and the examples mentioned within the very same chapters point in the direction of community tools. Same impacts on the design of the UIs design are therefore to expect.

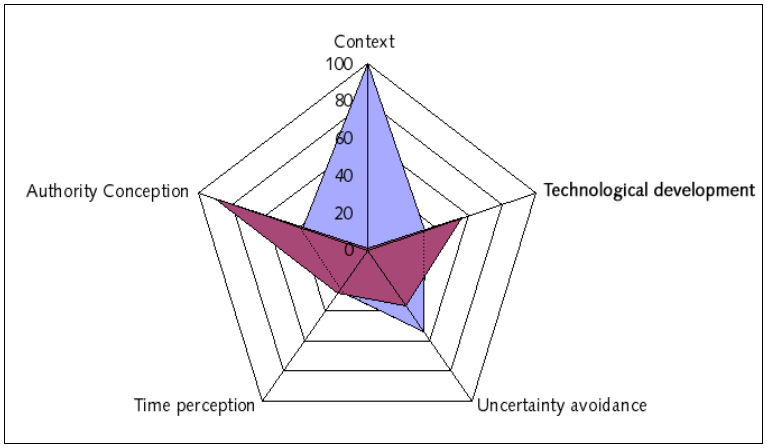
**Group 4**: D02 Activity orientation, D17 Meaning of life: Regarding metaphor building we can assume that societies that focus on material goals value doing more than being, the opposite might be true for spiritual oriented cultures. As already stated, this is just an assumption and has to be verified through more research and convenient tests.

**Group 5**: D18 Nonverbal communication, D23 Space: The dimension of space is mentioned within the dimension of nonverbal communication, called proxemics.

**Group 6**:  D26 Time orientation, D16 Long-term vs. Short-term orientation: In a way these two dimensions are complementary: The first mainly affects metaphors and navigation, the latter mental models and interaction. Within the statistical ranking of the average value, the two dimensions are followed by each other. The dimensions seem to cover

different areas of a society, but some implications on UI design might be the same, for example, future-oriented cultures are likely to be willing to learn how to use a UI if they know that it will be necessary to know how to use it in the future. The same can be true for long-term oriented societies.

If we had empirically researched values for all the cultural dimensions mentioned above of a certain country, it would be very easy to generate a tool that could answer the question: “Is it necessary to change the UI for a certain culture/country?” and “Regarding which dimensions must changes be considered?.” The basic idea for this tool is the use of star charts in the form of a pentagon, but expandable to more dimensions if needed, depending on how complex the localization project is. The diagram illustrates the cultural values of a targeted culture. Figure 2 shows a theoretical comparison. These diagrams can what changes are necessary and in what dimension, as Smith has demonstrated [Smith] but with different dimensions.



# Conclusions and Recommendations for Further Research

Generating a set of the most important 7±2 cultural dimensions for localizing Uis is a difficult task. The experts commented that everything depends on knowing the domain and purpose of the UI. Nevertheless, this survey sought to rank culture dimensions in relation to UI design components and to filter out the most important ones, the five dimensions of Context, Technological development, Uncertainty avoidance, Time perception, and Authority conception. Moreover, the original thesis work of Baumgartner provides a compilation of 29 culture dimensions annotated with detailed descriptions and concrete examples of what influence they have on certain domains of UI, and showing the UI design components that are especially affected.

The practical result is a grouped and ranked list of cultural dimensions that could form a decision making tool kit in a localization process. A second possible use of the findings is the idea of a diagram tool that could facilitate determining the culture-related changes necessary for localizing to a specific target country. We have also suggested the concept of a culturebase that could automatically or semi-automatically handle cultural changes for content management systems based on these dimensions. In the future, determining the top dimensions for special fields of UI design might be an interesting area of study that could contribute and verify the findings of this work. Developing a database with examples for the implication on each design component by each cultural dimension and gathering cultural values of each country/culture through empirical research could be a supporting work for the culturebase concept. Much remains to be researched. This study is a start.

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# Cultural Dimensions and Global Web UI Design:
## What? So What? Now What?

This white paper by Aaron Marcus and Associates, Inc. (AM+A) introduces dimensions of culture, as analyzed by Geert Hofstede in his classic study of cultures in organizations, and considers how they might affect user-interface designs. Examples from the Web illustrate the cultural dimensions.

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# Contents

# Introduction

**Companies that want to do international business on the web should consider the impact of culture on the understanding and use of Web-based communication, content, and tools.**

The Web enables global distribution of products and services through Internet Websites, intranets, and extranets. Professional analysts and designers generally agree that well-designed user interfaces improve the performance and appeal of the Web, helping to convert "tourists" or "browsers" to "residents" and "customers." The user-interface development process focuses attention on understanding users and acknowledging demographic diversity. But in a global economy, these differences may reflect world-wide cultures. Companies that want to do international business on the web should consider the impact of culture on the understanding and use of Web-based communication, content, and tools. This paper contributes to the study of this complex and challenging issue by analyzing some of the needs, wants, preferences, and expectations of different cultures through reference to a cross-cultural theory developed by Geert Hofstede.

A few simple questions illustrate the depth of the problem.

Consider your favorite Website. How might this Website be understood and used in New York, Paris, London, Beijing, New Delhi, or Tokyo, assuming that adequate verbal translation were accomplished? Might something in its metaphors, mental model, navigation, interaction, or appearance confuse, or even offend and alienate, a user?

Consider what year this is. Is it 2000? In some other counting systems, it is 4698, 5760, or 1420. Even to refer to the counting system of another culture might confuse or alienate people used to their own native system. Let us not forget that Hindu-Arabic numerals, which Western society now takes for granted, were once viewed as the work of the devil by Christian Europe, and educated people for hundreds of years blocked their introduction into European society. Whether people view imports from other cultures as delightful gifts or poisonous viruses is often a matter of socio-political context.

Consider the order in which you prefer to find information. If you are planning a trip by train, do you want to see the schedule information first or read about the organization and assess its credibility? Different cultures look for different data to make decisions.

# A New Issue for User-Interface Designers

In most projects, the complex interplay of user, business, marketing, and engineering requirements needs to be resolved by Web user-interface and information visualization designers. Their development process includes iterative steps of planning, research, analysis, design, evaluation, documentation, and training. As they carry out all of these tasks, however, they would do well to consider their own cultural orientation and to understand the preferred structures and processes of other cultures. This attention would help them to achieve more desirable global solutions or to determine to what extent localized, customized designs might be better than international or universal ones.

Cultures, even within some countries, are very different. Sacred colors in the Judeo-Christian West (e.g., red, blue, white, gold) are different from Buddhist saffron yellow or Islamic green. Subdued Finnish designs for background screen patterns (see Figure 1) might not be equally suitable in Mediterranean climates, in Hollywood, USA, or Bollywood, India. These differences go deeper than mere appearance; they reflect strong cultural values. How might these cultural differences be understood without falling into the trap of stereotyping other cultures?

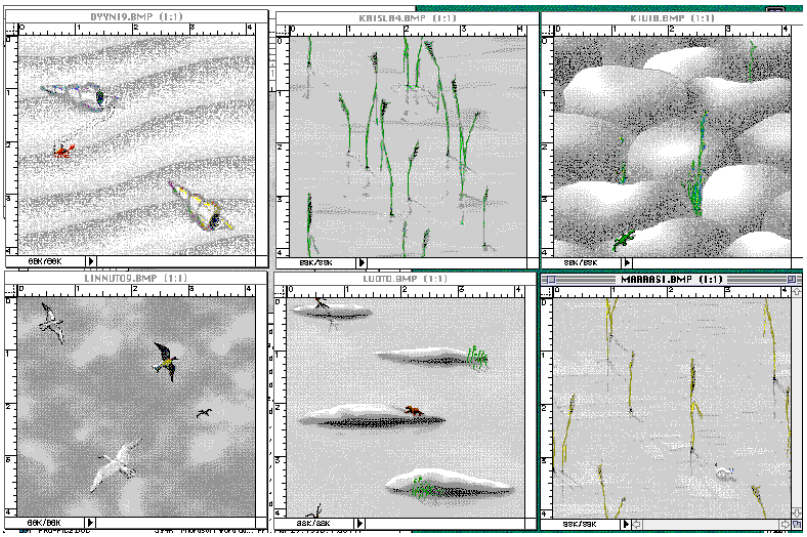

*Figure 1. TeamWare Finnish screen patterns*

Many analysts in organizational communication have studied cultures thoroughly and published classic theories; other authors have applied these theories to analyze the impact of culture on business relations and commerce (see Bibliography). Few of these works are well known to the

user-interface design community. This paper introduces the well-respected work of one theorist, Geert Hofstede, and applies some of his cultural dimensions to Web user interfaces. Edward T. Hall, David Victor, and Fons Trompenaars would have been equally valuable in illuminating the problems of cross-cultural communication on the Web, but our application of Hofstede will demonstrate the value of this body of research for our field.

# Hofstede's Dimensions of Culture

During 1978-83, the Dutch cultural anthropologist Geert Hofstede conducted detailed interviews with hundreds of IBM employees in 53 countries. Through standard statistical analysis of fairly large data sets, he was able to determine patterns of similarities and differences among the replies. From this data analysis, he formulated his theory that world cultures vary along consistent, fundamental dimensions. Since his subjects were constrained to one multinational corporation's world-wide employees, and thus to one company culture, he ascribed their differences to the effects of their national cultures. (One weakness is that he maintained that each country has just one dominant culture.)

In the 1990s, Hofstede published a more accessible version of his research publication in *Cultures and Organizations: Software of the Mind* [Hofstede]. His focus was not on defining culture as refinement of the mind (or "highly civilized" attitudes and behavior) but rather on highlighting essential patterns of thinking, feeling, and acting that are well-established by late childhood. These cultural differences manifest themselves in a culture's choices of symbols, heroes/heroines, rituals, and values.

Hofstede identified five dimensions and rated 53 countries on indices for each dimension, normalized to values (usually) of 0 to 100. His five dimensions of culture are the following:

- Power-distance
- Collectivism vs. individualism
- Femininity vs. masculinity
- Uncertainty avoidance
- Long- vs. short-term orientation

Each of Hofstede's terms appears below with our explanation of implications for user-interface and Web design, and illustrations of characteristic Websites.

# Power Distance (PD)

**Hofstede claims that high PD countries tend to have centralized political power and exhibit tall hierarchies in organizations with large differences in salary and status. Low PD countries tend to view subordinates and supervisors as closer together and more interchangeable, with flatter hierarchies in organizations and less difference in salaries and status.**

Power distance refers to the extent to which less powerful members expect and accept unequal power distribution within a culture.

Hofstede claims that high PD countries tend to have centralized political power and exhibit tall hierarchies in organizations with large differences in salary and status. Subordinates may view the "boss" as a benevolent dictator and are expected to do as they are told. Parents teach obedience, and expect respect. Teachers possess wisdom and are automatically esteemed. Inequalities are expected, and may even be desired.

Low PD countries tend to view subordinates and supervisors as closer together and more interchangeable, with flatter hierarchies in organizations and less difference in salaries and status. Parents and children, and teachers and students, may view themselves more as equals (but not necessarily as identical.) Equality is expected and generally desired. There are some interesting correlations for power distance: low PD countries tend to have higher geographic latitude, smaller populations, and/or higher gross domestic product (GDP) per capita than high PD countries.

Hofstede notes that these differences are hundreds or even thousands of years old. He does not believe they will disappear quickly from traditional cultures, even with powerful global telecommunication systems. Recent research has shown that the dimensions have remained quite stable for the last twenty years.

Based on this definition, we believe power distance may influence the following aspects of user-interface and Web design:

- Access to information: highly (high PD) vs. less-highly (low PD) structured.
- Hierarchies in mental models: tall vs. shallow.
- Emphasis on the social and moral order (e.g., nationalism or religion) and its symbols: significant/frequent vs. minor/infrequent use.
- Focus on expertise, authority, experts, certifications, official stamps, or logos: strong vs. weak.
- Prominence given to leaders vs. citizens, customers, or employees.
- Importance of security and restrictions or barriers to access: explicit, enforced, frequent restrictions on users vs. transparent, integrated, implicit freedom to roam.
- Social roles used to organize information (e.g., a managers' section obvious to all but sealed off from non-managers): frequent vs. infrequent

These PD differences can be illustrated on the Web by examining university Web sites from two countries with very different PD indices (Figures 2 and 3). The Universiti Utara Malaysia (www.uum.edu.my) is located in Malaysia, a country with a PD index rating of 104, the highest in Hofstede's analysis.


*Figure 2. High power distance: Malaysian Unversity Web site.*

*The Website from the Ichthus Hogeschool (www.ichthus-rdam.nl) and the Technische Universiteit Eindhoven (www.tue.nl) are located in the Netherlands, with a PD index rating of 38.*


*Figure 3a. Low power distance: Dutch Educational Website.*


*Figure 3b. Low power distance: Dutch Educational Website*

Note the differences in the two groups of Websites. The Malaysian Website features strong axial symmetry, a focus on the official seal of the university, photographs of faculty or administration leaders conferring degrees, and monumental buildings in which people play a small role. A top-level menu selection provides a detailed explanation of the

symbolism of the official seal and information about the leaders of the university.

The Dutch Websites feature an emphasis on students (not leaders), a stronger use of asymmetric layout, and photos of both genders in illustrations. These Websites emphasize the power of students as consumers and equals. Students even have the opportunity to operate a WebCam and take their own tour of the Ichthus Hogeschool.

# Individualism vs. Collectivism (IC)

**Individualistic cultures value personal time, freedom, challenge, and such extrinsic motivators as material rewards at work. Collectivist cultures value training, physical conditions, skills, and the intrinsic rewards of mastery.**

Individualism in cultures implies loose ties; everyone is expected to look after one's self or immediate family but no one else. Collectivism implies that people are integrated from birth into strong, cohesive groups that protect them in exchange for unquestioning loyalty.

Hofstede found that individualistic cultures value personal time, freedom, challenge, and such extrinsic motivators as material rewards at work. In family relations, they value honesty/truth, talking things out, using guilt to achieve behavioral goals, and maintaining self-respect. Their societies and governments place individual social-economic interests over the group, maintain strong rights to privacy, nurture strong private opinions (expected from everyone), restrain the power of the state in the economy, emphasize the political power of voters, maintain strong freedom of the press, and profess the ideologies of self-actualization, self-realization, self-government, and freedom.

At work, collectivist cultures value training, physical conditions, skills, and the intrinsic rewards of mastery. In family relations, they value harmony more than honesty/truth (and silence more than speech), use shame to achieve behavioral goals, and strive to maintain face. Their societies and governments place collective social-economic interests over the individual, may invade private life and regulate opinions, favor laws and rights for groups over individuals, dominate the economy, control the press, and profess the ideologies of harmony, consensus, and equality.

Based on this definition, we believe individualism and collectivism may influence the following aspects of user-interface and Web design:

- Motivation based on personal achievement: maximized (expect the extra-ordinary) for individualist cultures vs. underplayed (in favor of group achievement) for collectivist cultures
- Images of success: demonstrated through materialism and consumerism vs. achievement of social-political agendas.
- Rhetorical style: controversial/argumentative speech and tolerance or encouragement of extreme claims vs. official slogans and subdued hyperbole and controversy
- Prominence given youth and action vs. aged, experienced, wise leaders and states of being
- Importance given individuals vs. products shown by themselves or with groups
- Underlying sense of social morality: emphasis on truth vs. relationships
- Emphasis on change: what is new and unique vs. tradition and history

- Willingness to provide personal information vs. protection of personal data differentiating the individual from the group

The effects of these differences can be illustrated on the Web by examining national park Web sites from two countries with very different IC indices (Figures 4 and 5). The Glacier Bay National Park Website (www.nps.gov/glba/evc.htm ) is located in the USA, which has the highest IC index rating (91).


*Figure 4. High individualist value: US National Park Website.*

The Website from the National Parks of Costa Rica (www.tourism-costarica.com/) is located in a country with an IC index rating of 15.

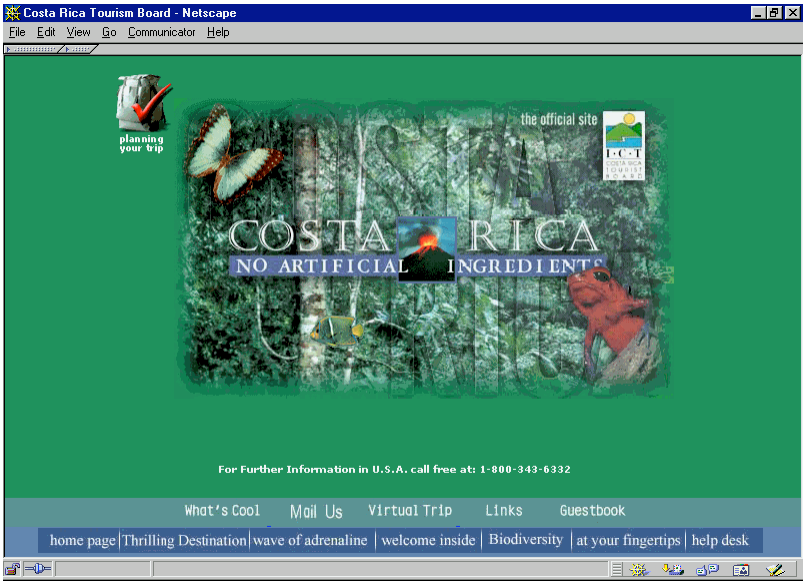


*Figure 5. Low individualist value: Costa Rican National Park Website.*

The third image (Figure 6) shows a lower level of the Costa Rican Website.


*Figure 6. Costa Rican Website What's Cool contents: Political message about exploitation of children.*

Note the differences in the two groups of Websites. The USA Website features an emphasis on the visitor, his/her goals, and possible actions in coming to the park. The Costa Rican Website features an emphasis on nature, downplays the individual tourist, and uses a slogan to emphasize

a national agenda. An even more startling difference lies below the What's Cool menu. Instead of a typical Western display of new technology or experience to consume, the screen is filled with a massive political announcement that the Costa Rican government has signed an international agreement against the exploitation of children and adolescents.

# Masculinity vs. Femininity (MAS)

**In masculine cultures, the traditional distinctions are strongly maintained, while feminine cultures tend to collapse the distinctions and overlap gender roles (both men and women can exhibit modesty, tenderness, and a concern with both quality of life and material success.)**

Masculinity and femininity refer to gender roles, not physical characteristics.

Hofstede focuses on the traditional assignment to masculine roles of assertiveness, competition, and toughness, and to feminine roles of orientation to home and children, people, and tenderness. He acknowledges that in different cultures different professions are dominated by different genders. (For example, women dominate the medical profession in the Soviet Union, while men dominate in the USA.) But in masculine cultures, the traditional distinctions are strongly maintained, while feminine cultures tend to collapse the distinctions and overlap gender roles (both men and women can exhibit modesty, tenderness, and a concern with both quality of life and material success.) Traditional masculine work goals include earnings, recognition, advancement, and challenge. Traditional feminine work goals include good relations with supervisors, peers, and subordinates; good living and working conditions; and employment security.

The following list shows some typical MAS index values, where a high value implies a strongly masculine culture:

95 Japan
79 Austria
62 USA
53 Arab countries
47 Israel
43 France
14 Netherlands
05 Sweden

Since Hofstede's definition focuses on the balance between roles and relationships, we believe masculinity and femininity may be expressed on the Web through different emphases. High-masculinity cultures would focus on the following user-interface and design elements:

- Traditional gender/family/age distinctions
- Work tasks, roles, and mastery, with quick results for limited tasks
- Navigation oriented to exploration and control
- Attention gained through games and competitions
- Graphics, sound, and animation used for utilitarian purposes
- Feminine cultures would emphasize the following:
- Blurring of gender roles

- Mutual cooperation, exchange, and relational support (rather than mastery and winning)
- Attention gained through poetry, visual aesthetics, and appeals to unifying values

Examples of MAS differences on the Web can be illustrated by examining Websites from countries with very different MAS indices (Figures 7 and 8). The Woman.Excite Website (woman.excite.co.jp ) is located in Japan, which has the highest MAS value (95). This Website narrowly orients its search portal toward a specific gender, which this company does not do in other countries.

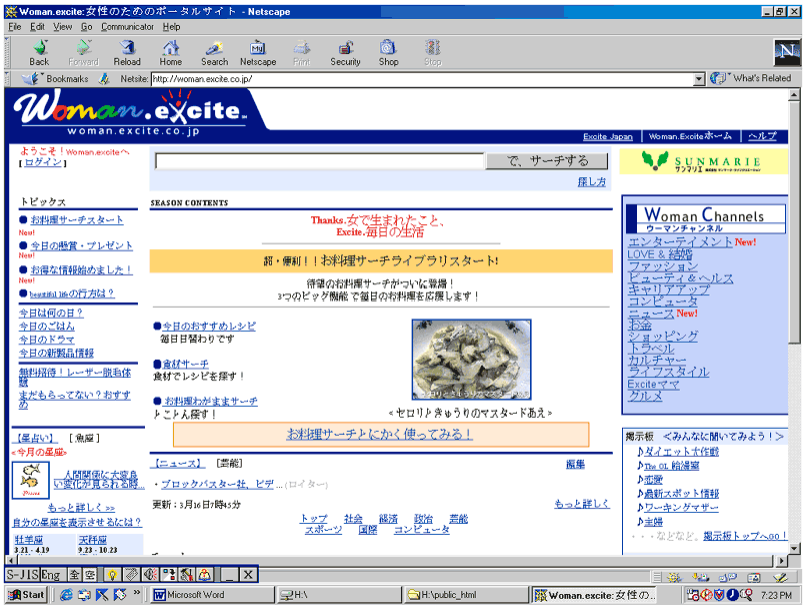


*Figure 7. High masculinity Website: Excite.com for women in Japan*

The ChickClick USA Website (MAS = 52) consciously promotes the autonomy of young women (although it leaves out later stages in a woman's life.)


*Figure 8. Medium masculinity Website: ChickClick.com in the USA.*

The Excite Website (www.excite.com.se) from Sweden, with the lowest MF value 5, makes no distinction in gender or age. (With the exception of the Netherlands, another low MAS country, all other European Websites provide more pre-selected information.)


*Figure 9Low masculinity Website: Swedish Excite.com.*

# Uncertainty Avoidance (UA)

**Cultures with high uncertainty tend to be expressive; people talk with their hands, raise their voices, and show emotions. People seem active, emotional, even aggressive; shun ambiguous situations. By contrast, low UA cultures tend to be less expressive and less openly anxious; people behave quietly without showing aggression or strong emotions.**

People vary in the extent that they feel anxiety about uncertain or unknown matters, as opposed to the more universal feeling of fear caused by known or understood threats. Cultures vary in their avoidance of uncertainty, creating different rituals and having different values regarding formality, punctuality, legal-religious-social requirements, and tolerance for ambiguity.

Hofstede notes that cultures with high uncertainty avoidance tend to have high rates of suicide, alcoholism, and accidental deaths, and high numbers of prisoners per capita. Businesses may have more formal rules, require longer career commitments, and focus on tactical operations rather than strategy. These cultures tend to be expressive; people talk with their hands, raise their voices, and show emotions. People seem active, emotional, even aggressive; shun ambiguous situations; and expect structure in organizations, institutions, and relationships to help make events clearly interpretable and predictable. Teachers are expected to be experts who know the answers and may speak in cryptic language that excludes novices. In high UA cultures, what is different may be viewed as a threat, and what is “dirty” (unconventional) is often equated with what is dangerous.

By contrast, low UA cultures tend to have higher caffeine consumption, lower calorie intake, higher heart-disease death rates, and more chronic psychosis per capita. Businesses may be more informal and focus more on long-range strategic matters than day-to-day operations. These cultures tend to be less expressive and less openly anxious; people behave quietly without showing aggression or strong emotions (though their caffeine consumption may be intended to combat depression from their inability to express their feelings.) People seem easy-going, even relaxed. Teachers may not know all the answers (or there may be more than one correct answer), run more open-ended classes, and are expected to speak in plain language. In these cultures, what is different may be viewed as simply curious, or perhaps ridiculous.

Based on this definition, we believe uncertainty avoidance may influence contrary aspects of user-interface and Web design.  High-UA cultures would emphasize the following:

- Simplicity, with clear metaphors, limited choices, and restricted amounts of data
- Attempts to reveal or forecast the results or implications of actions before users act
- Navigation schemes intended to prevent users from becoming lost
- Mental models and help systems that focus on reducing "user errors"

- Redundant cues (color, typography, sound, etc.) to reduce ambiguity.
- Low UA cultures would emphasize the reverse:
- Complexity with maximal content and choices
- Acceptance (even encouragement) of wandering and risk, with a stigma on “over-protection”
- Less control of navigation; for example, links might open new windows leading away from the original location.
- Mental models and help systems might focus on understanding underlying concepts rather than narrow tasks
- Coding of color, typography, and sound to maximize information (multiple links without redundant cueing.)

Examples of UA differences can be illustrated on the Web by examining airline Websites from two countries with very different UA indices (Figures 9 and 10). The Sabena Airlines Website (www.sabena.com ) is located in Belgium, a country with a UA of 94, the highest of the cultures studied. This Website shows a home page with very simple, clear imagery and limited choices.

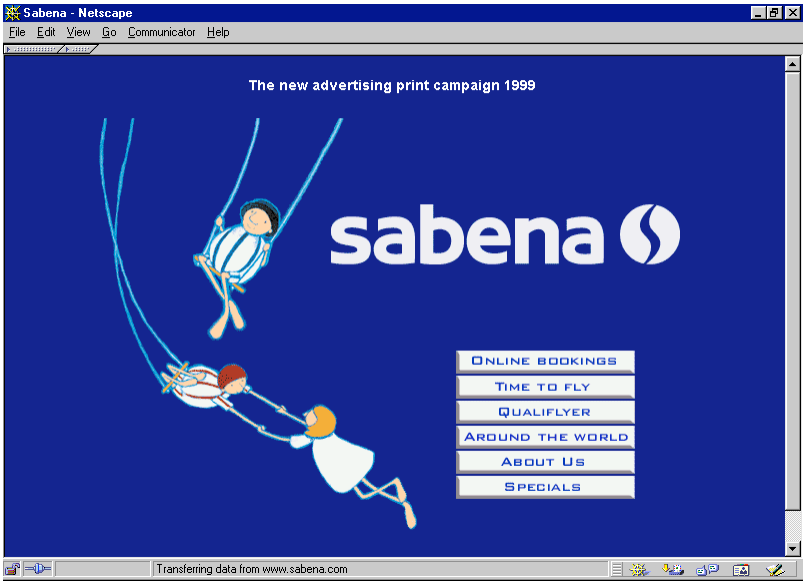


*Figure 10. High uncertainty avoidance: Sabema Airlines Website from Belgium.*

The British Airways Website (www.britishairways.com) from the United Kingdom (UA = 35) shows much more complexity of content and choices with popup windows, multiple types of interface controls, and “hidden” content that must be displayed by scrolling.

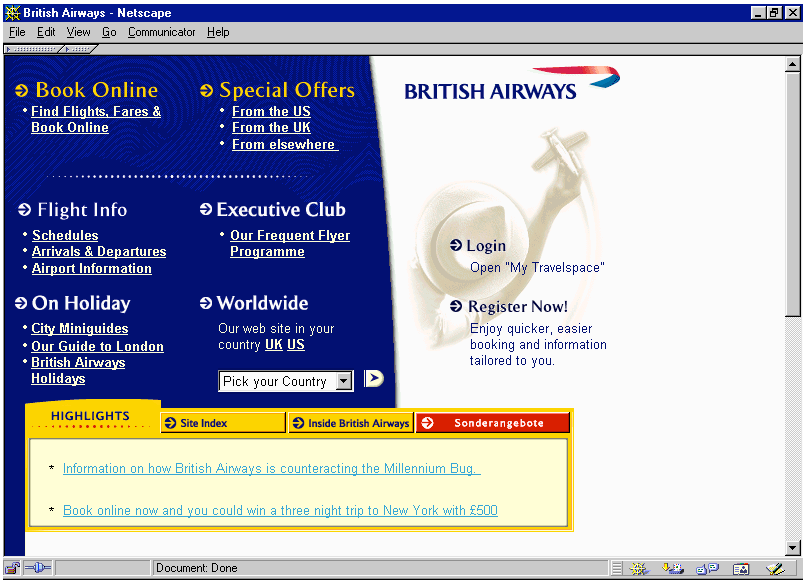


*Figure 11. Low uncertainty avoidance: British Airways Website from United Kingdom.*

# Long- vs. Short-Term Time Orientation (LTO)

**Long-Term Orientation seemed to play an important role in Asian countries that had been influenced by Confucian philosophy over many thousands of years. They concluded that Asian countries are oriented to practice and the search for virtuous behavior while Western countries are oriented to belief and the search for truth.**

In the early 1980s, shortly after Hofstede first formulated his cultural dimensions, work by Michael Bond convinced him that a fifth dimension needed to be defined. Long-Term Orientation seemed to play an important role in Asian countries that had been influenced by Confucian philosophy over many thousands of years. Hofstede and Bond found such countries shared these beliefs:

- A stable society requires unequal relations.
- The family is the prototype of all social organizations; consequently, older people (parents) have more authority than younger people (and men more than women).
- Virtuous behavior to others means not treating them as one would not like to be treated.
- Virtuous behavior in work means trying to acquire skills and education, working hard, and being frugal, patient, and persevering.

Western countries, by contrast, were more likely to promote equal relationships, emphasize individualism, focus on treating others as you would like to be treated, and find fulfillment through creativity and self-actualization. When Hofstede and Bond developed a survey specifically for Asia and reevaluated earlier data, they found that long-term orientation cancelled out some of the effects of Masculinity/Femininity and Uncertainty Avoidance. They concluded that Asian countries are oriented to practice and the search for virtuous behavior while Western countries are oriented to belief and the search for truth. Of the 23 countries compared, the following showed the most extreme values:

118 China (ranked 1)
80 Japan (4)
29 USA (17)
0 Pakistan (23)

Based on this definition, we believe high LTO countries would emphasize the following aspects of user-interface design:

- Content focused on practice and practical value
- Relationships as a source of information and credibility
- Patience in achieving results and goals
- Low LTO countries would emphasize the contrary:
- Content focused on truth and certainty of beliefs
- Rules as a source of information and credibility
- Desire for immediate results and achievement of goals

Examples of LTO differences on the Web can be illustrated by examining versions of the same company's Website from two countries with different LT values (Figures 11 and 12). The Siemens Website (www.siemens.co.de) from Germany (LT=31) shows a typical Western corporate layout emphasizing crisp, clean functional design aimed at achieving goals quickly.

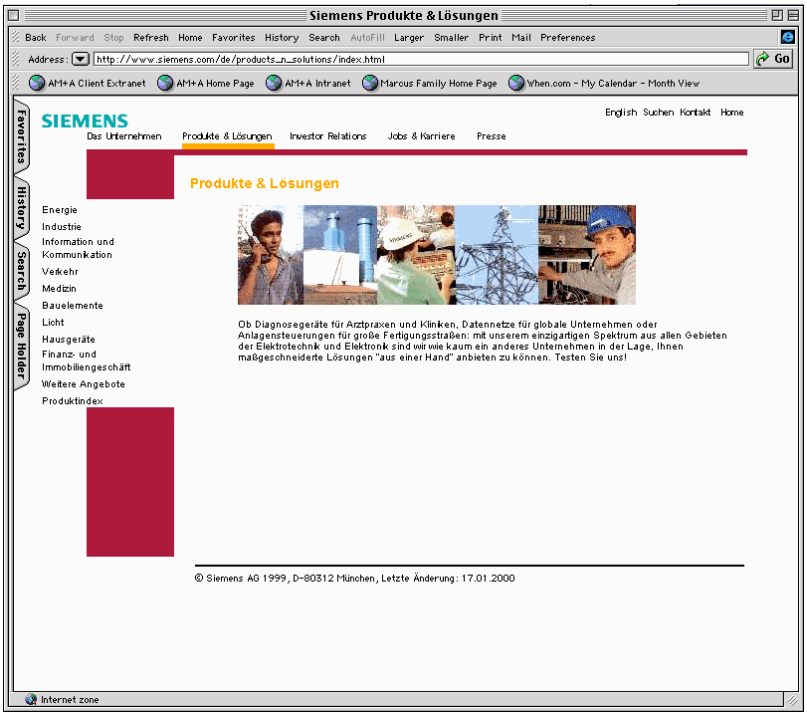


*Figure 12. Low Long-term orientation: Website form Siemens Germany.*

The Chinese version from Beijing requires more patience to achieve navigational and functional goals.


*Figure 13. High Long-Term Orientation. Website fromSiemens in China.*

# Conclusions

**Finally, if crosscultural theory becomes an accepted element of user-interface design, then we need to change our current practices and develop new tools. We need to make it feasible to develop multiple versions of Websites in a cost-effective manner, perhaps through templates or through specific versioning tools.**

Hofstede notes that some cultural relativism is necessary: it is difficult to establish absolute criteria for what is noble and what is disgusting. There is no escaping bias; all people develop cultural values based on their environment and early training as children. Not everyone in a society fits the cultural pattern precisely, but there is enough statistical regularity to identify trends and tendencies. These trends and tendencies should not be treated as defective or used to create negative stereotypes but recognized as different patterns of values and thought. In a multi-cultural world, it is necessary to cooperate to achieve practical goals without requiring everyone to think, act, and believe identically.

This review of cultural dimensions raises many issues about UI design, especially for the Web. We have explored a number of design differences through sample Websites but other, more strategic questions remain. In crafting Websites and Web applications, the questions can be narrow or broad:

- How formal or rewarding should interaction be?
- What will motivate different groups of people? Money? Fame? Honor? Achievement?
- How much conflict can people tolerate in content or style of argumentation?
- Should sincerity, harmony, or honesty be used to make appeals?
- What role exists for personal opinion vs. group opinion?
- How well are ambiguity and uncertainty avoidance received?
- Will shame or guilt constrain negative behavior?
- What role should community values play in individualist vs collectivist cultures?

Other questions might relate to specific types of Websites:

- Does the objective of distance learning change what can be learned in individualist vs. collectivist cultures? Should these sites focus on tradition? Skills? Expertise? Earning power?
- How should online teachers or trainers act – as friends or gurus?
- Would job sites differ for individualist vs. collectivist cultures?
- Should there be different sites for men and women in different cultures?
- Would personal Webcams be OK or Not OK?
- How much advertising hyperbole could be tolerated in a collective culture focused on modesty?
- Would an emphasis on truth as opposed to practice and virtue require different types of procedural Websites for Western or Asian audiences?

Finally, if crosscultural theory becomes an accepted element of user-interface design, then we need to change our current practices and develop new tools. We need to make it feasible to develop multiple versions of Websites in a cost-effective manner, perhaps through templates or through specific versioning tools. As the Web continues to develop globally, answering these questions, and exploring, then exploiting, these dimensions of culture, will become a necessity and not an option for successful theory and practice.

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# Appendix B: URLs and Other Resources

Selected URLs from the list at http://www.AmandA.com.

ACM/SIGCHI Intercultural listserve: chi-intercultural@acm.org.
Moderator: Donald Day, d.day@acm.org.

African-American Websites: bet.com, netnoir.com, blackfamilies.com

Color: colortool.com

Cultural comparisons: culturebank.com

Digital divide: digitaldivide.gov, digitaldivide.org, digitaldividenetwork.org/

Indian culture: indiagov.org/culture/overview.htm

Internationalization resources: world-ready.com/r_intl.htm, world-ready.com/biblio.htm

Internet statistics by language: euromktg.com/globstats/index.html, world-ready.com/biblio.htm
Localization: http://www.lisa.org/home_sigs.html

Native-American-oriented Website: hanksville.org/NAresources/

Simplified English: userlab.com/SE.html

Women: wow.com, oxygen.com, chickclick.com

www.HCIBib.org//SIGCHI/Intercultural

# Appendix C: Hofstede's Dimensions of Culture Index Table

Hofstede, Geert, *Cultures and Organizations: Software of the Mind: Intercultural Cooperation and its Importance for Survival,* McGraw Hill, New York, 1991, ISBN:0-07-029307-4.

PDI Power distance Index
UDV Individualism Index
MAS Masculinity Index
UAI Uncertainty Avoidance Index
LTO Long-Term Orientation Index

| | PDI | | IDV | | MAS | | UAI | | LTO | |
|---|---|---|---|---|---|---|---|---|---|---|
| | rank | score | rank | score | rank | score | rank | score | rank | score |
| Arab Countries | 7 | 80 | 26/27 | 38 | 23 | 53 | 27 | 68 | | |
| Argentina | 35/36 | 49 | 22/23 | 46 | 20/21 | 56 | 10/15 | 86 | | |
| Australia | 41 | 36 | 2 | 90 | 16 | 61 | 37 | 51 | 15 | 31 |
| Austria | 53 | 11 | 18 | 55 | 2 | 79 | 24/25 | 70 | | |
| Bangladesh | | | | | | | | | 11 | 40 |
| Belgium | 20 | 65 | 8 | 75 | 22 | 54 | 5/6 | 94 | | |
| Brazil | 14 | 69 | 26/27 | 38 | 27 | 49 | 21/22 | 76 | 6 | 65 |
| Canada | 39 | 39 | 4/5 | 80 | 24 | 52 | 41/42 | 48 | 20 | 23 |
| Chile | 24/25 | 63 | 38 | 23 | 46 | 28 | 10/15 | 86 | | |
| China | | | | | | | | | 1 | 118 |
| Columbia | 17 | 67 | 49 | 13 | 11/12 | 64 | 20 | 80 | | |
| Costa Rica | 42/44 | 35 | 46 | 15 | 48/49 | 21 | 10/15 | 86 | | |
| Denmark | 51 | 18 | 9 | 74 | 50 | 16 | 51 | 23 | | |
| East Africa | 21/23 | 64 | 33/35 | 27 | 39 | 41 | 36 | 52 | | |
| Ecuador | 8/9 | 78 | 52 | 8 | 13/14 | 63 | 28 | 67 | | |
| Finland | 46 | 33 | 17 | 63 | 47 | 26 | 31/32 | 59 | | |
| France | 15/16 | 68 | 10/11 | 71 | 35/36 | 43 | 10/15 | 86 | | |
| Germany FR | 42/44 | 35 | 15 | 67 | 9/10 | 66 | 29 | 65 | 14 | 31 |
| Great Britain | 42/44 | 35 | 3 | 89 | 9/10 | 66 | 47/48 | 35 | 18 | 25 |
| Greece | 27/28 | 60 | 30 | 35 | 18/19 | 57 | 1 | 112 | | |
| Guatemala | 2/3 | 95 | 53 | 6 | 43 | 37 | 3 | 101 | | |
| Hong Kong | 15/16 | 68 | 37 | 25 | 18/19 | 57 | 49/50 | 29 | 2 | 96 |
| India | 10/11 | 77 | 21 | 48 | 20/21 | 56 | 45 | 40 | 7 | 61 |
| Indonesia | 8/9 | 78 | 47/48 | 14 | 30/31 | 46 | 41/42 | 48 | | |
| Iran | 29/30 | 58 | 24 | 41 | 35/36 | 43 | 31/32 | 59 | | |
| Ireland (Republic of) | 49 | 28 | 12 | 70 | 7/8 | 68 | 47/48 | 35 | | |
| Israel | 52 | 13 | 19 | 54 | 29 | 47 | 19 | 81 | | |
| Italy | 34 | 50 | 7 | 76 | 4/5 | 70 | 23 | 75 | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Jamaica | 37 | 45 | 25 | 39 | 7/8 | 68 | 52 | 13 | | |
| Japan | 33 | 54 | 22/23 | 46 | 1 | 95 | 7 | 92 | 4 | 80 |
| Malaysia | 1 | 104 | 36 | 26 | 25/26 | 50 | 46 | 36 | | |
| Mexico | 5/6 | 81 | 32 | 30 | 6 | 69 | 18 | 82 | | |
| Netherlands | 40 | 38 | 4/5 | 80 | 51 | 14 | 35 | 53 | 10 | 44 |
| New Zealand | 50 | 22 | 6 | 79 | 17 | 58 | 39/40 | 49 | 16 | 30 |
| Nigeria | | | | | | | | | 22 | 16 |
| Norway | 47/48 | 31 | 13 | 69 | 52 | 8 | 38 | 50 | | |
| Pakistan | 32 | 55 | 47/48 | 14 | 25/26 | 50 | 24/25 | 70 | 23 | 0 |
| Panama | 2/3 | 95 | 51 | 11 | 34 | 44 | 10/15 | 86 | | |
| Peru | 21/23 | 64 | 45 | 16 | 37/38 | 42 | 9 | 87 | | |
| Philippines | 4 | 94 | 31 | 32 | 11/12 | 64 | 44 | 44 | 21 | 19 |
| Poland | | | | | | | | | 13 | 32 |
| Portugal | 24/25 | 63 | 33/35 | 27 | 45 | 31 | 2 | 104 | | |
| Salvador | 18/19 | 66 | 42 | 19 | 40 | 40 | 5/6 | 94 | | |
| Singapore | 13 | 74 | 39/41 | 20 | 28 | 48 | 53 | 8 | 9 | 48 |
| South Africa | 35/36 | 49 | 16 | 65 | 13/14 | 63 | 39/40 | 49 | | |
| South Korea | 27/28 | 60 | 43 | 18 | 41 | 39 | 16/17 | 85 | 5 | 75 |
| Spain | 31 | 57 | 20 | 51 | 37/38 | 42 | 10/15 | 86 | | |
| Sweden | 47/48 | 31 | 10/11 | 71 | 53 | 5 | 49/50 | 29 | 12 | 33 |
| Switzerland | 45 | 34 | 14 | 68 | 4/5 | 70 | 33 | 58 | | |
| Taiwan | 29/30 | 58 | 44 | 17 | 32/33 | 45 | 26 | 69 | 3 | 87 |
| Thailand | 21/23 | 64 | 39/41 | 20 | 44 | 34 | 30 | 64 | 8 | 56 |
| Turkey | 18/19 | 66 | 28 | 37 | 32/3 | 45 | 16/17 | 85 | | |
| Uruguay | 26 | 61 | 29 | 36 | 42 | 38 | 4 | 100 | | |
| USA | 38 | 40 | 1 | 91 | 15 | 62 | 43 | 46 | 17 | 29 |
| Venezuela | 5/6 | 81 | 50 | 12 | 3 | 73 | 21/22 | 76 | | |
| West Africa | 10/11 | 77 | 39/41 | 20 | 30/31 | 46 | 34 | 54 | | |
| Yugoslavia | 12 | 76 | 33/35 | 27 | 48/49 | 21 | 8 | 88 | | |
| Zimbabwe | | | | | | | | | 19 | 25 |

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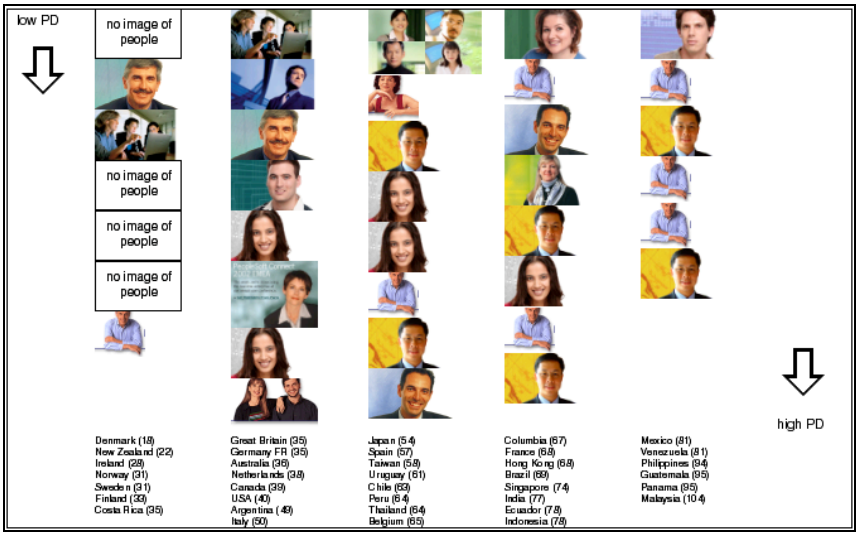
# Culture *vs.* Corporate Global Web UI Design




This white paper by Aaron Marcus and Associates, Inc. (AM+A) analyzes corporate global Web user-interface design standards under the influence of culture differences. Culture differences are described in terms of dimensions of culture, as analyzed by Geert Hofstede, among others. Examples from the Web illustrate the impact of culture on corporate global Web user-interface design.

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**Abstract**

Using examples from corporate Websites in several countries, this analysis compares user-interface components (metaphors, mental models, navigation, interaction, and appearance) with Hofstede's cultural dimensions (power distance, individualism-collectivism, gender roles, uncertainty avoidance, and long-term time orientation). Several typical patterns are observable.

## 1.0 Introduction

User-interface (UI) design for Websites are cultural artifacts. A goal of this paper is to analyze Websites in order to understand to what extent the corporate designs seem to exhibit differences that relate to cultural differences. We also wish to show to what extent Geert Hofstede's culture theory [Hofstede], which establishes five dimensions of culture, is appropriate for such research. Hofstede's dimensions (and ranges) are the following: power-distance (PD) (high vs. low) focuses on the degree of equality among people in the country's society; collectivism vs. individualism (IDV) focuses on the degree to which the society reinforces individual or collective, achievement or interpersonal, relationships; femininity vs. masculinity (MAS) focuses on the degree to which the society reinforces, or does not reinforce, the traditional masculine work role model of male achievement, control, and power (vs. feminine cultures in which the roles are more closely related); uncertainty avoidance (UA) (high vs. low) focuses on the extent to which the members of a society feel threatened by uncertain or unknown situations; time orientation (long vs. short) (LTO) focuses on the degree to which a society embraces, or does not embrace, long-term devotion to traditional values (strongly related to Confucian societies). Combining Hofstede's five dimensions with five components of UI design (metaphors, mental model, navigation, interaction, and appearance) [Marcus, 1997], one may examine 25 possible areas to evaluate how a Website is localized.

## 2.0 Method

When combining the schemes of Hofstede's cultural dimensions and design components, a 5x5 matrix that allows for 25 fields of interest.

| | PD | IDV | MAS | UA. | LTO |
|---|---|---|---|---|---|
| Metaphor | | | | | |
| Mental Model | | | | | |
| Navigation | | | | | |
| Interaction | | | | | |
| Appearance | | | | | |

An article by Marcus and Gould [Marcus and Gould, 2000] points out possible implications of Hofstede's dimensions for UI components. To find out if these assumptions match with "real life" is one goal of this article: *i.e.*, can examples be found in localized Websites? For this analysis, the authors attempted to be generally inclusive under constraints of time and chose reasonably complex, different "B2B" and "B2C" Websites from three different continents (USA, Europe, and Asia), as shown below. The exact circumstances of each Website design could not be determined; however, we examine evidence from the sites themselves.

| | US | Europe | Asia |
|---|---|---|---|
| Business | Sapient (S) | Siemens (SIE) | Hitachi (HIT) |
| | Peoplesoft (PEO) | SAP (SAP) | |
| Consumer | McDonalds (McD) | IKEA (IKE) | Sony (SON) |
| | Coca Cola (COC) | Mercedes (MER) | Mazda (MAZ) |

### 2.1 Key findings

The matrix below shows the Website examples studied. The abbreviations stand for the companies and appear in the corresponding positions of the above matrix. Note: examples do not appear in all of the matrix cells.

| | PD | IDV | MAS | UA | LTO |
|---|---|---|---|---|---|
| **Metaphors** | SIE HIT | SIE McD | McD | S SIE SAP IKE MER | |
| **Mental Model** | HIT | S SIE PEO MER | SIE | SIE | SIE |
| **Navigation** | S | | SIE | SIE McD | |
| **Interaction** | COC | | SIE McD MER | | HIT |
| **Appearance** | SIE PEO | | McD COC MER | SIE McD | SIE |

### 3.0 Analysis of culture dimensions and UI components

The following section discusses Hofstede's culture dimensions and within them user-interface components. For each component, visual examples from the selected Websites appear to provide context and clarification. Because of space limitations, we are not able to include all the visual examples researched. (More will appear in a forthcoming article [Marcus et al, 2003].)

### 3.1 Power Distance

*3.1.1 Metaphors*: According to Hofstede, countries with a very high power distance focus on expertise, authority, and/or experts. Applied to the field of UI design and working with the term “metaphor” one can assume that visual metaphors in such high power distance countries would show institutions, buildings or objects with a clear hierarchy. On the Siemens Website we see the Netherlands (low power distance) uses the eye-level portion of a person’s face as a metaphor for the home “button”, whereas Malaysia (high power distance) uses a city’s skyline. The Netherland’s picture is an “equal” (level) look into someone’s eyes (see [Kress and van Leeuwen]); Malaysia’s skyline view shows official buildings.

*Table 1. Siemens Website: personal images vs. official buildings*

| Netherlands (low power distance) | Malaysia (high power distance) |
|---|---|
|  Metaphor for “Home”: the face / the eyes of a person |  Metaphor for “Home”: an official building |

*3.1.2 Mental Model*: Considering mental models, it seems likely that countries with a high PD will prefer complex, highly organized, highly categorized, highly populated structures and reference data with little or no relevancy ranking. Countries with a low power distance will prefer simpler, informally organized and categorized structures, with less structured data with some or much relevancy. The Hitachi Website shows a contact page in Canada (low power distance) that offers limited, but well-structured contact data. The Hitachi Website in Singapore (slightly higher power distance) offers much contact information on one page. As opposed to the Canadian contact page, the information on the Singaporean contact page is highly categorized.

*3.1.3 Navigation*: Regarding navigation through a UI, and following Hofstede’s dimension definition, we assume that low power distance countries prefer open access, multiple options, and sharable paths; whereas high power distance countries have a higher use of authentication and passwords, and they prefer prescribed routes and restricted choices. A Website of Sapient supports this assertion. The careers frequently-asked questions (FAQ) page from the German

Website (low power distance) offers a variety of possibilities about how to apply for a job at Sapient. The same page within the Indian Website (high power distance) describes only one very restricted way to apply: the applicant must go through a standardized process by using the Web job-search engine and applying via a Web form.

*3.1.4 Interaction*: Interaction in the field of UI design refers to input and output sequences, including feedback for the user, as well as larger-scale behavioral aspects. The Coca Cola Website provides a good example that feedback in low power distance countries can mean "supportive error messages", whereas feedback in high power distance countries contains severe error messages. When one tries to login to the members' section on the Denmark site and types in an incorrect password, the error message is very polite (using words like "unfortunately…, please…"), tries to give an overview of what went wrong, and offers possible solutions by telling the user what to do. Exactly the contrary is true for the Malaysian feedback after a failed login: The expression "Bzzzzt!" seems not polite and does not explain what went wrong. The actual error message "wrong password!" seems more like a stern scolding, and the phrase "now for your next attempt…" does not guide the user to a possible solution.

*3.1.3 Appearance*: Applying Hofstede's research to visual appearance, we assume that countries with low PD prefer Websites that use "normal" people or groups; show daily activities; use popular music, symbols, typefaces, layouts, and colors; and employ informal speech. Countries with high power distance might use images of leaders, national, corporate, and government themes, slogans, insignia, logos, symbols, typefaces, layouts, and colors; official music or anthems; and formal speech. We can find supporting examples for this assertion on the PeopleSoft and Siemens Websites. A very strong supporting example can be found by comparing the Italian localization of Siemens with the Singaporean. The image used as a Home button in the upper-left corner shows a man and a woman in the Italian version, whereas the Singaporean Website uses the picture of an official monument surrounded by Singaporean skyscrapers.

*Table 2. Siemens Website: people vs. leaders*

| Italy (PD 50) | Singapore (PD 74) |
|---|---|
|  |  |
| Images of **people** | Images of **leaders**, **official Websites** |

### 3.2 Collectivism vs. Individualism

*3.2.1 Metaphors*: Applying Hofstede's theory, we assume metaphors used in collectivist countries might be relationship-oriented and content-oriented, whereas those in individualist countries might be action- or tool-oriented. Comparing Brazil's (collectivist) corporate McDonalds Website with the US (individualist), we see much more individualism in the US. We see the image of a single individual (one man) who represents the company. On the Brazilian Website we see a mixture of group images to represent the company.

*Table 3. McDonalds Website: focusing on groups vs. focusing on individuals*

| Brazil (collectivist) | United States (individualist) |
|---|---|
|  Images of **groups** an organizations that should visualize the section "McDonalds in Brazil" |  Images of a **single person** to visualize the "Corporate" section of McDonalds USA. |

*3.2.2 Mental Model*: When considering the mental model of individualist countries, we assume the individual is the most important part in such a model. Individualist countries therefore might use very product- or task-oriented mental models in which personal achievement is maximized, whereas collectivist countries might emphasize role-oriented models underplaying personal achievement. For individualist and collectivist approaches within text, we show an example of the PeopleSoft Website. Comparing the Singaporean (collectivist) and the German (individualist) "About PeopleSoft" sections, we find a significant difference regarding emphasizing personal achievement. Singapore's Website speaks about the role the company plays in the world's economy, mentions the employees and partners, and talks about how PeopleSoft can help its customers. The German Website simply mentions the company's founding date and location, and it emphasizes the CEO, who is mentioned by name.

### 3.3 Femininity vs. Masculinity

*3.3.1 Metaphors*: Comparing the Finnish (feminine) with the Austrian (masculine) McDonalds Website, we find a metaphor on the front page

that supports the idea that feminine countries focus on family and shopping, whereas masculine countries prefer sports and competition.

*3.3.2 Mental Model*: Applying Hofstede's assumptions about femininity and masculinity to the component of mental models, we assume we shall find social structures in feminine countries and work/business structures in masculine countries. We also might expect detailed views and relationship-oriented approaches in feminine countries, whereas we might find high-level, "executive views" and goal-oriented approaches in masculine countries. The Siemens Website supports this assertion: Whereas the Norwegian (feminine) careers page focuses on social structures and is very relationship-oriented (the main sections are entitled "What we are looking for" and "What we can offer"), the Austrian page (masculine) emphasizes the quality of the company and advanced education possibilities for employees, which seems goal oriented.

*3.3.3 Navigation*: The contact page of the Siemens Website offers multiple choices in Sweden (feminine) but only one possibility to contact the local company in Japan (masculine). This example supports the assertion that feminine countries would prefer multiple choices, multi-tasking, and polychronic approaches, whereas masculine countries would prefer limited choices and synchronic approaches.

*3.3.4 Interaction*: Regarding interaction, we assume high masculinity countries prefer game-oriented, mastery-, and individual-oriented approaches. In countries emphasizing gender differentiation and competitiveness less, we expect these approaches less and more practical, function-oriented approaches. The McDonalds Website is an example that supports this assertion: The Swedish (feminine) Website focuses on the client service by providing many ways to get into direct contact with the company. On the Austrian (masculine) Website, it is much easier to find the fun and games section than contact information. The fun section contains technical content such as screensavers and wallpapers, a link to send an e-card, and a score-based game. A client-service section is not available on the Austrian Website.

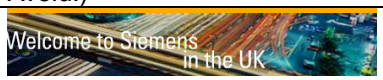
*3.3.5 Appearance*: In countries with a feminine index, we expect harmonious colors and shapes. Among three examples found, we present a study of the Mercedes-Benz Website: Although the Mercedes-Benz Website is very similar in all the localized Websites, we find a major difference in the design for Sweden (feminine) and Germany (masculine). The visual design approach from Sweden uses softer edges and shapes than the German approach. The German layout focuses more on clear structure and avoids cuteness.

### 3.4 Uncertainty Avoidance

*3.4.1 Metaphors*: Applying Hofstede's theory about uncertainty avoidance to the UI component of metaphors, we assume countries with low uncertainty avoidance would not shun, and might even prefer, novel, unusual references and abstraction, whereas cultures with a high amount of uncertainty avoidance would ask for familiar, stable, and clear references to daily life and for representation instead of abstraction. IKEA is a European furniture store that is known for its casual, easy-going advertisement style and its low prices. The Swedish (low uncertainty avoidance) Website uses the slogan "Nothing is impossible" which is quite ambiguous. The French (high uncertainty avoidance) Website uses the very specific slogan "Design at [a] small [low] price". We find a similar situation at the Sapient Website: All Websites localized for countries with a low uncertainty avoidance value (according to Hofstede's values, under 65) use the slogan "MAKING TECHNOLOGY MATTER", which is not very specific. Italy and Japan score high on the uncertainty avoidence scale and use the more precise text "DESIGNING TECHNOLOGY HUMANS CAN USE".

The same pattern holds not only for textual elements but for imagery: When comparing the British (low uncertainty avoidance) and the Belgian (high uncertainty avoidance) Websites, we find pictures that act as metaphors. The UK Website shows a very dynamic photo of unidentifiable technical objects and the slogan "Welcome to SIEMENS in the UK," *i.e.*, an abstract representation of the company. The Belgian Website shows varied pictures of daily life, which act as representations.

*Table 4. Siemens Website: abstraction vs. representation*

| United Kingdom (low unc. Avoid.) | Belgium (high uncertainy avoidance) |
|---|---|
|  |  |
| Novel, unusual references, **abstractions** | Familiar, clear references to daily life, **representations** |

*3.4.2 Mental Model and Navigation*: Considering the mental model, we expect tolerance for ambiguousness, implicit structures or relations, complexity, and fuzzy logic in countries with low UA. Conversely, we expect simple, explicit, clear articulation; limited choices; and binary logic in countries with high UA. Because the components of mental model and navigation are closely related (structure and process), they are considered together and are impacted similarly as in the previous description. Both Switzerland and Belgium are multilingual countries. When a user enters the Siemens Website of Switzerland (low UA), it is

possible for her/him to choose among the languages, but it is also possible to access directly several links. The Belgian Website offers a more binary logic: a user always must decide at the beginning in which language s/he wants to explore the Website. Not until this is done can s/he navigate deeper into the mental model of the Website.

*Table 5. Siemens Website: variety vs. consistency.*

| United Kingdom (low unc.avoid.) | Belgium (high uncertainty avoidance) |
|---|---|
|  |  |
| Ambiguous, varied imagery | Simple, clear, consistent imagery |

*3.4.4 Appearance*: Considering the UI component of appearance, we assume low uncertainty avoidance countries may expect tolerance for more perceptual characteristics involved in purely ornamental or aesthetic use and less redundant coding of perceptual cues. Countries with a high uncertainty avoidance may prefer simple, clear, and consistent imagery, terminology, and sounds. The users may expect highly redundant coding of perceptual cues. Again, we can find an example corroborating these assertions by comparing the Belgium (high uncertainty avoidance) with the UK (low uncertainty avoidance). At the Siemens Website, the imagery is much more consistent and redundant on the Belgian Website than on the British Website.

### 3.5 Long-Term Time Orientation

*3.5.1 Mental Model*: Hofstede's theory seems to imply that long-term time-oriented countries would more actively pursue the long-term perspective. The following example shows the difference in mental model concerning long-term time orientation: Pakistan (short time orientation) mentions in a text on the Siemens Website the size and locations of the company. China (long time orientation) focuses on the long-lasting history of the company.

*3.5.2 Interaction*: Regarding interaction in short-term time oriented countries we assume that distance communication is accepted as more efficient; and, therefore, anonymous messages are tolerated more. Inhabitants of long-term time oriented countries may prefer face-to-face communication, harmony, and, to achieve that harmony, personalized messages. We can find an example of this pattern at the Hitachi

Website. The US (short-term time orientation) Website offers a contact page on which the user can find only a Web form to place a message. At the Singaporean (long-term time orientation) Website, we find a Web form as well as personal contact information. The personal information is at the top of the page, so it seems more likely that the user selects this personal form of communication.

*3.5.3 Appearance*: Short-term time-oriented countries seem more likely to focus on achieving goals quickly; hence, they might tend to show fewer things, avoid overly ornamented imagery, and focus on achieving practical goals. Long-term time oriented countries might do just the opposite. Siemens shows the use of imagery in both long- and short-term time-oriented countries. China (long-term time orientation) uses warm, fuzzy images and pictures of groups, whereas Pakistan (short-term time orientation) concentrates on showing tasks or products.

*Table 6. Siemens Website: task-oriented vs. group-oriented.*

| Pakistan (shortest-term time orient.) | China (longest-term time orientation) |
|---|---|
|  Concentration on showing **tasks** or products |  Warm, fuzzy images, pictures of **groups** |

**4.0 Visual syntax patterns**

The previous analysis concentrated on specific cultural dimensions and, within each, the likely characteristics of UI components. It is also possible to examine broader patterns of visual syntax, for example, layout. We compared images found on home pages of Websites of Siemens and PeopleSoft, and we present observations for the dimension of power distance.

Considering power distance, the following patterns are noticeable:

1.Websites that do not put a picture on the front page come from low power-distance value countries.

2.The eight countries with the highest power distance value show a picture of a man on their Websites.

*Table 7. PeopleSoft Website: Front page imagery in order of power distance.*


## 5.0 Conclusion

In this exploration of Websites, we discovered that our matrix-oriented method helps to organize and analyze data collection. Initial observations suggest that cultural habits run deeply and operate even under constraints of global design specifications. In high individualistic and low power-distance countries, variations from standard practice seem likely to be most frequently observed.

We point out that presenting the examples cited, while useful to illustrate patterns, does not necessarily mean that, *ipso facto*, any particular pattern is the *right* way to design or revise a UI for a particular application or culture. The designer must take both context and culture into account. In addition, the UI designer also might consider how these patterns may influence cultures and design conventions, which undergo a continuous process of change.

One likely result of such research is a “culturebase” with specific conditions and predictable results that would inform a content management system (CMS). However, to draw specific conclusions and to use them in a CMS, more data are needed. This research method seems useful and productive. Further research could produce quantitative and qualitative results that may feed culture-localization templates and tools.

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# Culture-Centered Design: Culture Audit of Screen Designs for Educational Software in Saudi Arabia

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**Abstract.** This paper describes screen design issues in a culture audit performed on software prior to translation. The authors found that this effort was cost-effective, because, for relatively little money and time, one can identify problematic items that translation services may not uncover, avoiding the end result of translating well what should never have been localized in the first place. In the cultural analysis section, we provide an overview of the wider cultural and social context of the rapid educational reform currently underway in the target country, Saudi Arabia. Because most educated users in the target country have learned to use the Microsoft Office Suite, we recommend that the design of Office be used as a baseline reference for any redesign.

**Key words:** audit, business, culture, design, development, software, icons, management, Saudi Arabia, user experience, user interface.

## 1 Introduction

The authors worked with Client X (anonymity requested), a major software translation and localization firm. Their own client (Client Y) was in the process of converting educational software that serves more than 100,000 schools and universities throughout the United States and 165 countries worldwide. In 2009 Client X partnered with AM+A to provide a culture-oriented evaluation of the software's usability, usefulness, and appeal for the Saudi Arabian market (with eventual adaptation for the Gulf and Levantine regions), focusing on the visual design and use of icons and imagery. For this project, AM+A conducted a culture audit, examining icons, graphics, concepts, and terminology. In addition, a small sample of Saudi students studying in North America was recruited to review parts of the interface and to discuss customization.

## 2 Cultural Analysis

### 2.1 Educational Change

In considering the user-interface requirements for an Arab version of the library management application, it is important to understand the influence of the central

government on the adoption of software and the training of academics to use new educational technologies.

Saudi Arabia is engaged in a major spending program to combat the global recession and maintain its economy. Much of this spending ($32.6B, or 25% of the total) is aimed at education and training. More than 1500 new schools are scheduled to be built and more than 2000 renovated [1]. New private colleges and the two new elite universities have introduced educational reforms. King Abdullah has emphasized the need for the Kingdom to embrace higher education, for women as well as men, to diversify its economy, reduce dependence on oil exports, and employ its graduates.

The *General Project for Curriculum Development*, adopted in 2002 by the Ministry of Education, laid the groundwork for the increased use of educational technologies. However, a recent study describes barriers that prevent full use of technology in the schools (M. Al-Abdulkareem, 2008, as cited in [2]):

- Weakness of infrastructure, especially communication infrastructure
- Need for technology specialists
- Lack of technological knowledge and skills among teachers and administrators
- English language barriers (for example, most Web 2.0 tools are in English)
- High cost of technology

The Computer and Information Center in the Ministry of Education has the mission of overcoming these problems and managing the development of educational technology and infrastructure. However, not all schools are computerized and not all schools are connected. The Ministry Website notes that there are 2,300 computer labs (39,100 PCs) in elementary and intermediate schools, 3,000 (51,000 PCs) in secondary schools, and 2,000 Learning Resource Centers (12,000 PCs) [3]. However, there are more than 28,000 schools throughout the country [4].

Boys and girls are educated separately and it is not clear whether education for girls is at the same level of technological adoption. A separate department within the Ministry, the General Presidency of Girl's Education, handles requirements for girls' education. Although King Abdullah promotes female education and expanded career options, religious conservatives continue to restrict opportunities, and many women academics complain that the system is unequal [5]. As a result, a number of private schools exist alongside the public school system, and many (like Dar Al-Fikr Private School in Jeddah) have been sources of curricular and technological innovation [2].

The Ministry's latest ten-year plan (2005) seeks an integrated solution for the application of information and communication technologies by 2014 [6]. In addition there are plans to train 30,000 teachers.

### 2.2 Cultural values

Hofstede's 1997 study of cultural values characterized Arab cultures as having high power distance (respect for authority), medium collectivism, and medium masculinity [7]. However, these ratings need to be put in context. Hofstede did his research in the 1970s-1980s; he sampled employees of a Western corporation (IBM); and he amalgamated the statistics from a number of Arab countries (Egypt, Iraq, Kuwait, Lebanon, Libya, and the United Arab Emirates, as well as Saudi Arabia). As he himself admits, "impressionistically, the Saudis within this region are even more

collectivist than some other Arabs like Lebanese or Egyptians" (p. 54). Studies of Saudi Arabia itself describe the country as having extremely high power distance, strong collectivism, and strong masculinity.

These cultural values influence the educational system. Power distance is expressed in a number of ways. Not only is government education centralized, it is standardized and based on religious teachings. Schools follow a curriculum that focuses on instilling Islamic values. Elementary students take nine hours per week of Islamic studies from first to sixth grades; intermediate students take eight hours per week from seventh to ninth grades [8].

Concern with moral values legitimates censorship and public surveillance. Women aren't allowed to buy CDs and DVDs in shops; Internet cafes are required by law to install surveillance cameras; and *Arab News* reported the Saudi Communication and Information Technology Commission asked Research in Motion to allow it to monitor BlackBerry Messenger service or be shut down. [9] Government censors the Internet through its Internet Services Unit; new laws authorize five-year jail sentences for people distributing "pornography or other materials that violate public law, religious values, and social standards of the kingdom" [10]. Saudi Arabia is considered one of the least open countries on the Internet.

Similarly, Saudi Arabia has extremely strong collectivism; national and religious goals are promoted over individual goals in the school systems. Even though King Abdullah's educational reforms are intended to upgrade standards and open new professional opportunities to men and to women, his program is couched in nationalistic and religious terms. The concept of the *ummah*, the community of believers, is central to Islam and used to justify the kingdom's social conservatism.

Lastly, Saudi Arabia practices strict gender segregation and, until recently, restricted women to non-technical jobs. Girls are now being encouraged to consider new occupations, *e.g.*, software engineering and architecture, but all professions remain segregated. For example, only women teach women. If women professors are not available, men lecture women students using video technology and have no other contact with them. Children are educated separately, but girls are not required to cover until they become teenagers.

## 3 Visual Analysis

### 3.1 Examples of websites considered sophisticated and attractive

The students were asked to nominate websites that demonstrated good design. These examples of Saudi Websites were considered particularly sophisticated and attractive.

*Figure 1: Saudi Arabian Airlines, left, King Saud University, right Photographic images are also used as buttons on both websites.*

### 3.2 Examples of Websites popular with young Saudis

While not a universal preference, Saudi young people tended to prefer sites with a simplified appearance overall and a limited number of colors, as shown in the accompanying figures.

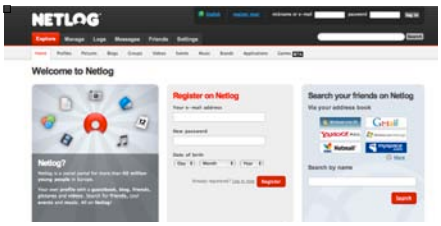


*Figure 3: NETLOG is a European equivalent of Facebook that has a wide selection of languages, including Arabic. http://en.netlog.com/*


*Figure 4: kammelna.com offers card games. Hihi2 has sports news.*

### 3.3 Colors used on library sites of Saudi colleges and universities

Most Websites for Saudi educational institutions use blue, green and gray palettes. The color green is associated with Islam, but is acceptable for use on secular Websites. (See www.findouter.com/MiddleEast/Saudi_Arabia/Education for more education-related websites,.)

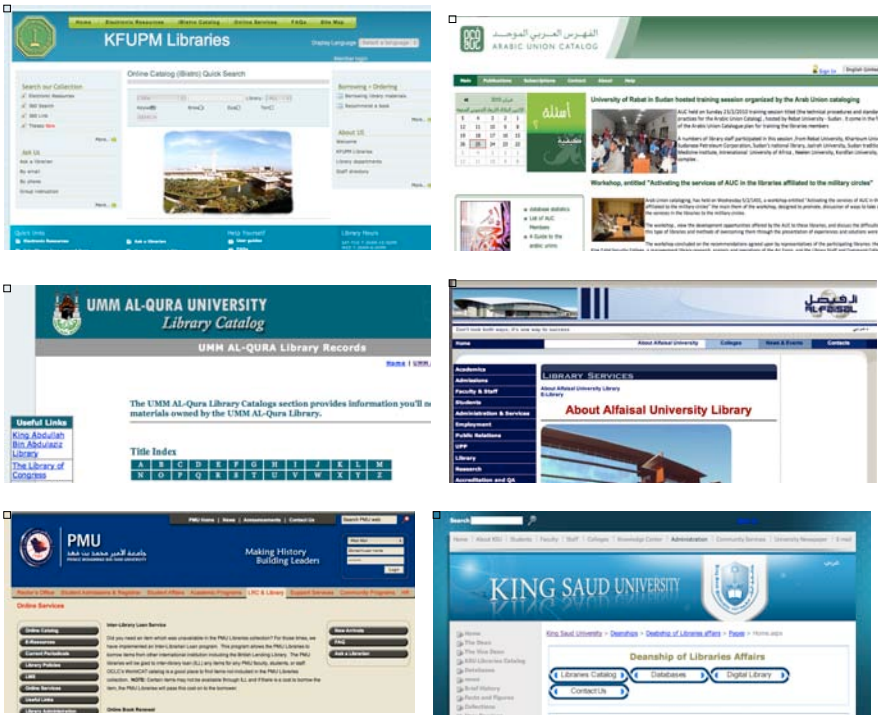


*Figure 5: Typical colors in academic and library Saudi Websites*

### 3.4 Microsoft Office baseline

Most educated Saudis are familiar with the Microsoft Office suite through their introduction to MS Office products during secondary school education. If in doubt about whether an icon is appropriate or meaningful, user-interface designers can safely refer to the equivalent icon in an Office application as a basis for concept and appearance. All of the students had been trained to use MS Office products during secondary school. When asked if they would prefer local software, they said that they preferred to use translated Microsoft products. One conjecture is that Microsoft has come to represent the standard, the "best" product available; another is that students liked the opportunity to switch between the translated Arabic and English interfaces to improve their language skills. However, as Saudi educational standards improve and more graduates begin developing a local software industry, this recommendation may change.

Screenshots from some of Microsoft's localized Middle Eastern applications are shown below.


*Figure 6: Microsoft Excel and PowerPoint in Arabic versions*

### 3.5 Icon usage: General issues

As seen in the reference Websites, most buttons and tabs on Saudi and other Arabic-language Websites contain text only; there is very little use of icons. There does not appear to be any general cultural objection to icons. This trend may be a result of an artistic tradition in which calligraphy is a major art form and figurative painting less valued. Photographs, however, are widely used on nearly every Arabic-language Website and often identify buttons.

On the King Saud University Website, below, buttons usually have text only, but occasionally there are icons in addition to text. (Note that when Websites are available online in both Arabic and English, icon usage is almost always the same in both languages.)


*Figure 7: King Saud University. Typically buttons, menus, and tabs have text only.*

### 3.6 Icons with specific cultural or linguistic problems

As a general rule, icon design should avoid the use of Roman alphabet or numeric characters, as in the examples below.


There are some exceptions to this rule: where the Roman character is in wide use as an international symbol, it can be used without translation. Many standard icons use characters from the Roman alphabet, but are meaningful because of widespread Internet usage.

Icons which might be associated with other religions, such as a Christian cross, star of David, or a magic wand, should be avoided. Plus signs are acceptable as indicating that something new is being added. However, the vertical line of the plus should not be longer than the horizontal, to avoid any resemblance to a Christian cross. Both witchcraft and sorcery are outlawed in the Kingdom, and a psychic was arrested and sentenced to death as recently as November 2009 [11].


The thumbs-up icon is used by some young Saudis on social networking sites to indicate approval, but it could be misinterpreted by older Saudis. Hand gestures often do not translate well between cultures and should be avoided.

Similarly, icons showing people should be abstract, gender-neutral and well-clothed due to the importance of female modesty in Islamic culture. For example, icons should avoid the suggestion of short sleeves or uncovered hair for young women.

### 3.7 Visual themes and customization of backgrounds

Respondents told us that they customized their mobile phones with photographs and preferred to put their own photos in backgrounds (appealing images included soccer heroes, beaches, pleasant views, and Angelina Jolie). However, note that the use of personal photographs in social media has been contentious. A recent court case in Saudi Arabia dealt with the possible damage to a young woman's reputation from photos placed on Facebook [9] Most of the images we saw on Saudi Websites were photographs of men in authority (like King Abdullah) or views of modern buildings that reinforce national pride.

### 3.8 Text size on buttons

Graphic designers should be aware that there is a 25% size expansion rate when English is translated into Arabic, if the type size remains the same.[11] Buttons should be sized accordingly to keep type easy to read. In the table below the Arabic text has been reduced in size so it takes less space than the English text, but the type is small and cramped. User testing may be required to ensure that the text is legible.

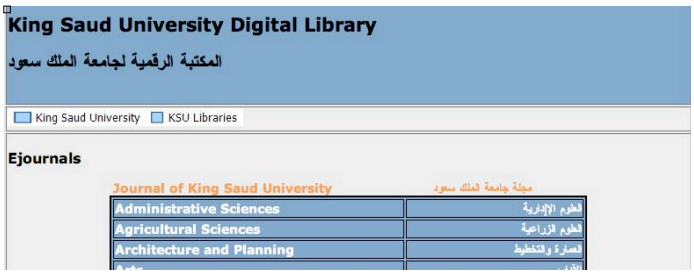


*Figure 9: http://digital.library.ksu.edu.sa*

### 3.9 Dual language pages

Some Arabic library sites have been designed so that the same page can accommodate English text on the left and Arabic text on the right. This has advantages for bilingual users who need to switch back and forth between languages when searching for materials in both languages.

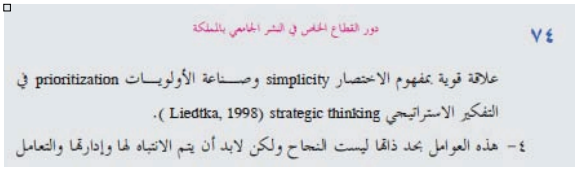


*Figure 10: Using two languages on one page is common with Modern Arabic: note the use of Bidirectional Input (Right-to-Left English words and names embedded in Left-to-Right Arabic text). Users switch directions using standardized key combinations.*

### 4 Conclusions

Translating its library software is an excellent first step for Client Y to localize its product for sale in Saudi Arabia. To keep localization expenditure to a minimum, the basic visual design and color palette of the current software could be used with only minor changes. However, it is important to realize that at least two levels of acceptance are involved. Users must feel comfortable with and enjoy the interface but, first, the country's conservative religious and social culture must approve the product for use in schools.

This application could be made more appealing to the Middle Eastern market by making the design resemble some of the more popular Saudi sites with a crisper, cleaner look. Incorporating more blues into the screen design would also bring it more closely in line with Saudi tastes. Further, icons with a more abstract, simplified look would better harmonize with the abstract geometric appearance of Arabic calligraphy.

However, to pass an initial review, library administrative user interfaces may need to accommodate Saudi concerns about access to information. All decisions on purchase and implementation of software for government schools are taken by the national Ministry of Education and many types of books remain restricted.

Nevertheless, this is a unique and exciting time for an American company to engage with the process of educational change. Saudi Arabia is dramatically raising the level of the whole educational system, equalizing opportunities for girls and boys and implementing modern educational technology. As the country builds and equips its new schools, it is negotiating its own path to modernity and its students are finding their own places in the wider world.

As the current (2005) Ten Year Plan notes:

*The development and wide spread of unrestricted mass media communication and the reduction of its costs constitute a challenge and a threat to the Kingdom's national identity and culture. This issue requires a balanced approach that will allow students*

*to enjoy the benefits of modern technology (which, in turn, will benefit the community) while maintaining the Kingdom's values and faith, and that is able to protect them from the risks that might harm them as individuals and groups and that might negatively affect Muslim society*. [6]

And, as we support the efforts of young people themselves throughout North Africa and the Middle East to bring change, we should provide appropriately localized technology for education and social improvement.

## 5 Acknowledgments

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# Company Culture Audit to Improve Development Team's Collaboration, Communication, and Cooperation

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**Abstract.** Multinational companies worldwide seek to improve product/service development-teams operating in different countries. One of their objectives is to improve collaboration, communication, and cooperation among teams. Aaron Marcus and Associates, Inc. (AM+A) recommended countries and locations in which to undertake research into teamwork within a company, accounting for cultural differences and approaches to teamwork/leadership

**Key words:** Business, collaboration, communication, cooperation, culture, design, development, software, management, user interface, user experience

## 1 Introduction

A California client planned a company-wide study of collaboration and asked AM+A to recommend four sites from a list of 15 countries in six work regions. The client had already chosen a specific site in the US because, as the client's corporate headquarters, it needed to be able to work with sites throughout the world. A key assumption of our recommendations was that the other sites should represent the *greatest diversity relative to the headquarters site in terms of culture*, along with the *greatest opportunities for innovation in collaboration*.

Initially, we used two sets of criteria to identify appropriate sites. The first set of criteria were based on traditional measures of culture that are applicable to teamwork. The second set dealt with technological innovation and globalization. After an informational interview with the project sponsors, additional criteria were discussed and additional data on the client employee demographics were made available. As a result, an additional criterion was added in our data summary: gender balance.

## 2 Recommendations

AM+A recommended that the four cities to be studied along with the US corporate headquarters site should be the following:

| | | |
|---|---|---|
| Amsterdam | Netherlands | Representative of North European, gender-balanced, egalitarian styles of collaboration |
| Bangalore | India | Representative of both S. Asian mentor-based collaboration and new modes of globalization |
| Dubai | United Arab | Representative of high power distance and new |

| | | |
|---|---|---|
| | Emirates | modes associated with globalization |
| Tokyo | Japan | Representative of East Asian, Confucian-based collaboration styles (high power distance and strong work group orientation) |

Alternative cities included:

- Feltham for Amsterdam: Because the US and UK share many cultural values, Amsterdam was chosen as representative of more egalitarian, gender-neutral styles.
- Singapore for Dubai: Dubai currently leads the world in population growth as the UAE moves from oil to a new economy based on trade, finance, and information. Singapore has already successfully refocused its economy on the same elements through a much more regulated and state-controlled process representative of traditional Chinese values (strong leadership, high power distance, and collectivism).
- Seoul for Tokyo: Like Tokyo, Seoul uses a strongly Confucian style of leadership that promotes group coordination and tends to limit individual action.

If circumstances allowed further cities, Shanghai could be researched. It was not included in the initial list due to the AM+A's understanding that this project was seeking out the most diverse (orthogonal) range of collaboration practices within the client's international sites. We believe the spectacular increase in Chinese university training based on Western models has diluted the traditional Confucian orientation of young employees. By contrast, Japanese (and Korean and Singaporean) employees are expected to be more conservative in their communication style. In all cases, AM+A recommended specific locations with at least 200 employees to be researched so that the data collected would have strong statistical validity.

**2.1 Data Visualization of the Recommendations**

Using data supplied by the client and data that AM+A located, AM+A prepared a summary "visual table" comparing the international cities that AM+A recommended in comparison to the headquarters city. The values show the headquarters city presented with a value set at 1.0, and other values based on the data sources cited immediately below. The sequence emphasizes the cities that the client subsequently selected: Amsterdam, Bangalore, Singapore, and Tokyo, with data for Dubai and Shanghai shown additionally. The black rectangles show the maximum values for the criteria, and the white rectangles show the minimum values for the criteria.

The cities recommended provide strongly different culture attributes, which should make for effective, valuable studies of client corporate culture and differences and/or similarities in teamwork, which is the objective of the client's research. The sources of the data follow the table:


- *Power Distance:* With the exception of Shanghai, this data is drawn from the raw scores comparing 53 countries and national regions by Hofstede (1997). Due to his dependence on IBM data, Hofstede did not include China in his original study. As a result, the score for China is drawn from Schwartz's comparison of 39 cultural groups (1994) for Hierarchy, normalized from a 9-point scale in ratio to the US.
- *Individualism:* As with Power Distance, all scores for individualism are taken from Hofstede (1997) with the exception of Shanghai. That score is taken from Schwartz's score for Conservatism, reversed, normalized, and cross-validated against his scores for Egalitarian Commitment, Affective Autonomy, and Intellectual Autonomy.
- *Digital Nativity*: This variable, defined as the client employees 30 and younger, is taken from employee demographic data.
- *High Growth/ New Cities*: This data is taken Urban agglomerations: Average annual rate of change (%), *World urbanization prospects: The 2007 revision population database,* available online from the United Nations Population Division (esa.un.org/unup).
- *Female/Male Gender Ratio:* Variable taken from client employee demographic data.

# 3 Analytical Criteria

## 3.1 Traditional Measures of Culture

Since the early 1980s, a large number of variables have been identified from factor analysis to explain differences between national and regional cultures. Some of these traditional measures include the following:

| | |
|---|---|
| Hofstede's (1997) work dimensions (inc. Hofstede and Bond, 1988): | • Power distance<br>• Individualism *vs.* collectivism<br>• Long-term time-orientation (~ Confucian values) |
| Trompenaars and Hampden-Turner's (1998) cultural dimensions: | • Universalism *vs*. particularism<br>• Communitarianism *vs*. individualism<br>• Neutral *vs*. emotional expression (~ use of reason or feelings in relationships)<br>• Diffuse *vs*. specific range of involvement<br>• Achievement *vs*. ascription |
| Triandis' (2000) cultural syndromes: | • Individualism |
| Markus and Kitayama's (1991) notion of self-concept: | • Independent self-concept<br>• Interdependent self-concept |
| Schwartz's (1999) cultural dimensions: | • Conservatism<br>• Affective autonomy<br>• Intellectual autonomy<br>• Hierarchy<br>• Egalitarian Commitment<br>• Mastery<br>• Harmony |

Despite the large number of concepts, many overlap. (Different researchers factor analyzed different data sets, which led to divergent results.) In addition, the concepts defined by Hofstede, Trompenaars and Hampden-Turner, and Triandis are ranged along a single continuum from high to low or most to least (*e.g.*, power distance), while those measured by Markus and Kitayama and by Schwartz allow for greater diversity of behavior. According to Markus and Kitayama, individuals can hold independent and interdependent types of self-concept at the same time, but Hofstede theorized that people were *either* individualists or collectivists. (Note for comparison that Marcus and Baumgartner analyzed nine culture models by 11 authors, which elicited 29 dimensions that were rated by approximately 60 experts world-wide. From this set five "top" or most widely recommended dimensions emerged: context, technological development, uncertainty avoidance, and time perception. Data by country do not exist for all of these dimensions; they were not used for this paper.)

These traditional culture concepts are often associated with specific types of teamwork. In particular, Hofstede identified three major clusters of countries on the basis of ratings for power distance and individualism:

- High power distance/ collectivist: Mexico, China [Hong Kong], Singapore
- High power distance/ individualist: France

- Low power distance/ individualist: US, United Kingdom, Netherlands

People in collectivist countries with high power-distance (respect for authority) tend to be very dependent on their in-groups and rely on strong leaders who exercise moral authority. In addition, they may avoid direct confrontation (although they can engineer situations that let them apply rules to justify refusal). It is important to note that there are many historical variations of these values. India, with its tradition of close cooperation and mentorship between experienced and novice group members, is quite different from Tokyo, where managers are more separate from subordinates.

People in individualistic countries with high power-distance often develop bureaucratic systems that allow them to reconcile personal independence with absolute authority and centralized power. By contrast to collectivist countries, they may be more confrontational. People in individualistic countries with low power distance tend to work in loose groups and to treat others as peers; their allegiance to their in-groups is relatively weak so they find it easier to work with new people and outsiders. However, even within this cluster, there are historical patterns. Scandinavia is considered more egalitarian and "feminine"; work roles show less gender bias and groups look to achieve consensus.

There is much "surface validity" in Hofstede's categories, and he has been used in many studies of international business. However, when using Hofstede as a guide to study collaboration, it is important to remember that his data were collected from IBM in the late 1970s and early 1980s. Much has changed in global business since then, and much has changed in terms of the technologies and corporate strategies mandating teamwork. Hofstede was challenged by Michael Bond to develop a better measure for Asian countries. The result was a study based on Chinese cultural values, which looked at long-term vs. short-term orientation. As might be expected, China was ranked first of 23 countries, Japan fourth, and the US and the UK seventeenth and eighteenth. Several other client country sites ranked in between, with Brazil sixth, India seventh, Singapore ninth, and the Netherlands tenth. Trompenaars and Hampden-Turner's data are more recent (mid-1980s to late 1990s). Many of their culture concepts overlap with Hofstede's; others deal with notions of social systems first defined by Talcott Parsons in 1951 that are applicable to teamwork:

- Universalists use rules that apply to everyone and rely on procedural equity; particularists see social situations as more complex and tend to apply different rules to different types of people.
- Communitarians – like collectivists – place the needs and objectives of their group memberships ahead of their personal needs; individualists place their own needs first.
- People who display neutral affect tend to use reason as a basis for developing relationships; people who display a more emotional affect are more open about their feelings and expect emotional responses.
- People who have a specific range of involvement tend to view different business and personal contexts as separate from one another. They may recognize the authority of a manager at work but treat that manager as an equal when encountered at the mall. People who have a diffuse range of involvement with their work do not separate these contexts – a manager whose authority they recognize at work will retain that authority when met in a different situation.

Achievement and ascription refer to two methods used to assign group status and leadership. Status based on achievement is earned through an individual's personal accomplishments, especially work-related success. Status based on ascription is due to an individual's titles, gender, age, class, or education. Trompenaars and Hampden-Turner analyzed a somewhat larger group of countries than Hofstede but did not always measure the same group of countries for each culture concept. Using Trompenaars and Hampden-Turner's categories, the client's work sites were classified. Using these culture categories along with Hofstede's work dimensions began to show new differences between apparently similar countries like the Netherlands and UK, and Japan and China.

A third culture theorist, Harry Triandis, believes individualism is the most important of all cultural dimensions for explaining behavior. However, he notes that this factor can be modified by a wide range of cultural "syndromes," like social complexity, tightness (ethnic homogeneity *vs*. heterogeneity), and hierarchy. Cultures that are less complex or highly homogeneous tend to be collectivist; most people will display more conformity and suppress individual expression. However, from our work with Japanese students and employees, it is important to remember that people in tight or collectivist societies continue to think of themselves as highly individualist; they just choose to put group interests first.

Markus and Kitayama also support this notion of duality. They found that the cultural dimension labeled individualism *vs*. collectivism was too simplistic and unable to explain real-world behavior. As a result, they redefined the phenomena as two mutually-coexisting concepts: Independent Self-concept and Interdependent Self-concept. Their new variables better explain why American individualists give so broadly to charity while Malaysian collectivists do not. Strong membership in in-groups and an interdependent self-concept may prevent support for others in so-called out-groups. By contrast, people with an independent self-concept have a weak alliance to their in-groups and can see people in out-groups as being individuals just like them. These two types of self-concept may be important when looking at matrix management systems and the use of temporary work groups: in some cultures, longer-term groups may be more effective.

Finally, a last set of culture variables dealing with power and individualism was developed by Shalom Schwartz. His research was conducted in the late 1980s to mid-1990s; his values can stand alone but are also correlated. Conservativism is generally opposed to Intellectual and Affective Autonomy, Hierarchy to Egalitarian Commitment, and Mastery to Harmony. Conservatism (plus Hierarchy, and Mastery) roughly equates to Collectivism while Intellectual and Affective Autonomy and Egalitarian Commitment equate to Individualism. Schwartz's use of the term harmony refers to respect for the natural world, not group harmony. Thus, his values tend to highlight differences between countries like the US and China that focus on mastery for economic growth and areas like northern Europe seeking stable growth to preserve the environment. Schwartz also collected data from many countries and has tables listing values for his variables. Although he does not list rankings for the UK, UAE, Russian Federation, Saudi Arabia, or India, he does rank the rest of the client sites. Schwartz (1999) made some clear predictions about relationships between his cultural values and specific work behaviors in the following table:

| **Hypothesized Compatibility and Conflict of Culture Value Emphases with Dimensions of Work** | | |
|---|---|---|
| | **Culture Value Emphases** | |
| **Dimensions of Work** | **Compatible** | **Conflicting** |
| *Work Centrality:* Contrasted with leisure, community, family, religion | Mastery<br>Hierarchy | Affective Autonomy<br>Egalitarianism<br>Harmony<br>Conservatism |
| *Societal Norms re Working:* Entitlement *vs.* Obligation | Egalitarianism<br>Intellectual Autonomy | Conservatism<br>Hierarchy |
| *Work Values:* Power | Hierarchy<br>Mastery | Harmony<br>Egalitarianism |
| *Work Values:* Intrinsic (personal growth and creativity) | Intellectual Autonomy<br>Affective Autonomy | Conservatism |
| *Work Values:* Extrinsic (monetary rewards) | Conservatism<br>Hierarchy | Intellectual Autonomy |
| *Work Values:* Social | Egalitarianism<br>Harmony | Hierarchy<br>Mastery |

This table suggests that Asian countries and northern European countries should be very different in terms of work centrality. In addition, like Hofstede, Schwartz recognizes France as having a unique blend of conservatism and intellectual and affective autonomy (roughly equivalent to high power-distance and strong individualism). Finally, he includes an element of environmental consciousness (relatively low for all countries with the client's sites) with his emphasis on harmony.

**Summary of traditional measures of culture criteria:** This review of culture theory highlights both the advantages and disadvantages of selecting sites for research on collaboration by using culture values alone. These values have strong impact. They do make it possible to hypothesize relationships to specific work behaviors and have been used widely in research. However, there is no one consistent set of variables, and many of the concepts were developed with data collected fifteen to thirty years ago. As a result, AM+A suggested using these culture values i*n conjunction with other criteria*, which seek to capture some of the changes taking place in corporate collaboration and technology-mediated teamwork.

### 3.2 Criteria: Technological Innovation and Globalization

The second set of criteria suggested for the client's study accommodates recent changes in the use of computer and communications technology and in global economics. There is a growing literature on the importance of recognizing generational differences, specifically, the rise of a generation of "digital natives," and the development of high growth cities and new forms of urban life.

As early as 1997, Johnston and Johal used culture theory to define the Internet as a new "virtual cultural region." Since then, the focus has shifted to the idea of *digital*

*nativity*. Digital natives, or "millennials," have grown up surrounded by computers, mobile devices, video games, and the Internet. Older people have always used some other form of technology first; they are *Digital Immigrants*, held back by previous impressions of the "right" way to do things. Many claims have been made about the differences between digital natives and digital immigrants, such as the following quote by Prensky (2001) discussing changes in education: *"Digital Natives are used to receiving information really fast. They like to parallel process and multi-task. They prefer their graphics before their text rather than the opposite. They prefer random access (like hypertext). They function best when networked. They thrive on instant gratification and frequent rewards. They prefer games to "serious" work….But Digital Immigrants typically have very little appreciation for these new skills that the Natives have acquired and perfected through years of interaction and practice."*

To understand the full potential of new modes of communication, it is important to ask digital natives how they simultaneously work together and apart through social media. For the client to identify both current and future types of collaboration, sites with large numbers of new hires and digital natives should be visited. In the US, there has been some contention between digital natives and the baby boom generation; the baby boomers developed many of our traditional computer technologies but the new focus on social media often escapes them. They remain wedded to more structured media interactions, while digital natives thrive on instant availability and constant interaction. Outside the US, young Indian (and Chinese) college graduates have typically been the first to achieve computer literacy in their families. They join with fewer preconceptions about media and tend to see it in highly creative ways.

The rise of new types of cities is the second postmodern influence that the client should seek to capture in its study of collaboration. Throughout Asia, and parts of the Middle East, Latin America, and Africa, new cities are developing on the basis of new economic principles. In 1980, the estimated population of the United Arab Emirates was little more than 1 million; in 2009, it reached 5 million and, by the end of 2010, the government expects an additional 1.9 million for a total of 7.5 million (UAE Interact, 2010). For every child born in the UAE in 2009, 22 migrants arrived, making the country the world leader in immigration. Thus, 73.9% of the working age population (15-64) consists of non-nationals with 2.74 men per woman. The median age of the UAE is 30.1 years: 32 for men and 34.7 for women (CIA, 2010). Singapore similarly has doubled its population from about 2.4 million in 1980 to almost 5 million in 2009, but its age and gender demographics are now less skewed (Statistics Singapore, 2010). Current population growth is about 1% per year, mainly through immigration (15$^{th}$ in the world). The gender ratio is roughly equal, with a median age of 39 for both men and women (CIA, 2010), Both cities developed on the basis of trade, finance, and information rather than manufacturing, agriculture, or government.

**Summary of technological innovation and globalization criteria:** The client's professionals and staff currently working in such new cities are more likely to be globally diverse, young, digital natives who can anticipate future collaboration. Dubai currently epitomizes both the positive and negative effects of high growth and rapid urbanization. Investment in infrastructure has created a vibrant economy in the middle of the Gulf. However, gender ratios are highly skewed in favor of young men, and large numbers of expatriates are disconnected from traditional local culture. By

contrast, Singapore followed a much more planned path to growth. Research there is likely to review more traditional Chinese attitudes to authority and collaboration.

### 3.3 Criteria: Equal Employment and Gender Ratio

Part way through our analysis, the client made available demographic data that allowed us to analyze the number of digital natives at various company sites. This data also made it possible to investigate an additional criterion: gender ratio.

Hofstede notes that countries differ on a continuum of Masculinity and Femininity, which refer to traditional gender roles and to attitudes associated with each gender. Men in masculine societies seek out jobs that require mastery; women take jobs that require nurturing others. Furthermore, men are expected to be assertive; women, modest. By contrast, men and women in feminine countries are less subject to rigid gender expectations. Men may be elementary school teachers; women, computer programmers. Both genders tend to be modest, avoid direct conflict, and respect (and expect respect) from others. Two aspects of a balanced gender ratio are important for collaboration. First, feminine societies tend to focus more on participation, persuasion, and consensus than masculine societies. Unions are included in company management and techniques like participatory design are popular. Masculine societies focus more on challenge, reward, and individual recognition. Master programmers are celebrated and proffered as role models for new employees.

**Summary of equal opportunity and gender ratio criteria:** The US has been fighting for equal employment in technical positions for decades. For a while in the 1990s, the gender ratio in computer science improved, but stereotypes of technology and of those who work in technological jobs ("geeks") have reduced the number of women attracted to such positions. As a result, AM+A suggests Amsterdam as a site for study of collaboration in feminine cultures and Bangalore and/or Dubai as sites for the study of teamwork in young, masculine cultures. According to the employee demographic provided by the client, the gender ratio in Singapore is slightly higher than in the company's headquarter site or in Amsterdam. Nonetheless, we believe that the number of women in technical positions may well be higher in the Netherlands and is more likely to provide an opportunity to analyze egalitarian styles of work.

### 3.4 Additional Considerations: Corporate Culture and the HQ Effect

During client meetings, challenges of collaboration between headquarters staff and the client employees in other countries were mentioned. This reference opened a discussion about corporate culture and its relation to national culture. The client employees are made aware of the corporate values. Many of these values reflect a classically US emphasis on personal fulfillment (empowerment, fun), mastery (innovation), efficiency (frugality), and continuous improvement. Teamwork is critical, but the *style* of teamwork tends to be more masculine than feminine. The consensus was that the client's corporate values provide a backdrop to discussions within the company about collaboration and that differences in power between headquarters and the regions are just as much, or more, of an influence.

## 4 Conclusion

This discussion presents AM+A's analysis of country cultures and specific cities, and their impact on values, attitudes, concepts, and behaviors related to teamwork. This analysis was used by the client to develop specific tools and techniques to improve collaboration, communication, and cooperation of multi-country teams.

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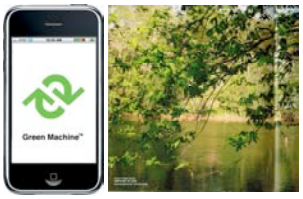
## Green Machine: Mobile Decision Displays to Promote Eco-Action

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## AM+A: Introduction

- User-experience development
- User-interface development
- Information design/visualization development
- Persuasion design



## AM+A's Vision and Mission for 28 Years

AM+A helps people
**make smarter decisions faster:**
anyone, any time, any place,
any technology, any market,
any subject matter

AM+A shapes the way technology
affects everyday life
through user-centered development
of effective and compelling
**user-interface, information-visualization and storyselling**



## Books, Publications




## Clients, Projects

***12 of 30 Dow Jones Industrial Average™ Firms**

| | |
|---|---|
| **Am Express** | Nokia |
| **AT&T** | Oracle |
| BMW | Ricoh |
| **Citigroup** | Sabre |
| **DuPont** | Samsung |
| Kodak | Siemens |
| eBay | **3M** |
| Epson | US Fed R Bank |
| Fujitsu | Virgin America |
| **GE** | Visa |
| **GM** | Xerox |
| **Honeywell** | |
| **HP** | |
| **IBM** | |
| Intel | |
| J. Paul Getty Trust | |
| Kaiser | |
| Learning Company | |
| Livescribe | |
| **Microsoft** | |
| Motorola | |



## Green Machine: Design Data Decision Displays to Promote Eco-Behavior

- How can information design/visualization present persuasive information to promote ecological, or sustainable, short-term eco-actions and long-term eco-behavior?
- How can mobile technology assist in presenting persuasive information and promote eco-behavior

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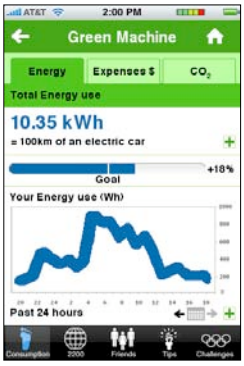
## Work in Progress: Where we Are and How we Got there

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## Meter Design: The Past

- Fixed hardware designs, limited data
- Viewed by utility technicians: headquarters and meter readers


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## Meter Design: The Future

- Variable, detailed, contents, probably **massive** data
- Viewed by utility, but also: home/business customers/users, interested groups, the public
- Mixed contexts
  - Desktop/mobile devices: at home, play, and on the way
  - Social media
  - Games, competition
  - Education, training, behavior modification, videos
  - Marketing of products, services, persuasion
  - Search engines, network visualization

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## Challenges

- Design useful info viz of new, massive data
- Means of social participation, scalable technology
- Develop appropriate metaphors, mental model, navigation, interaction, appearance
  - Desktop and mobile solutions
  - Interaction widgets and multiple window coordination Long time series (>10K time points), multiple variables, controlled precision
- Find good discovery process-model
  - Integrate statistics and visualization
  - Support annotation (tabbing) and collaboration
  - Preserve history, undo, macros, etc.
  - Example: Spotfire (e.g., Retinol discovery)

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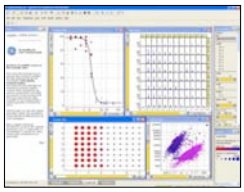
## Info Viz Examples

- Spotfire (www.spotfire.com)



LifeLines (www.cs.umd.edu/hcil)

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## Social Media: Transforming Society

- **Communication:** Blogs, micro-blogging, social networking, soc net aggregation, event logs/tracking
- **Collaboration:** wikis, social bookmarking (social tagging),social news, opinions, Yelp
- **Multimedia:** photo/video sharing, livecasting, audio/music sharing
- **Reviews and Opinions:** product/business reviews, community Q+As
- **Entertainment:** platforms, virtual worlds, game sharing

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## Social Media Examples

- WatchJeffersonCounty (www.watchjeffersoncounyt.net)
- AmberAlert (www.amberalert.gov)


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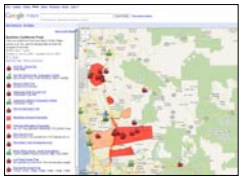
## Social Media Examples, 2/2

- Flickr (www.flickr.com/groups/socalwildfires/)
- Google/Maps (www.centernetworks.com)

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## Social Media Energy Examples

- Energystar.gov
- Microsoft-hohm.com


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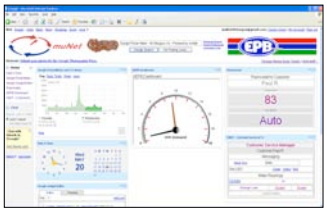
## Google's Power Meter

- Google's Power Meter technology separate from utilities and other channels

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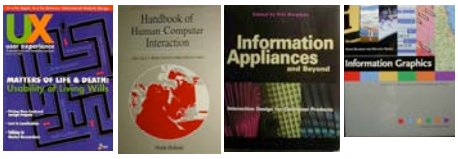
## Books, Publications

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*12 of 30 Dow Jones Industrial Average™ Firms

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| BMW | Ricoh |
| **Citigroup** | Sabre |
| **DuPont** | Samsung |
| Kodak | **3M** |
| eBay | US Fed R Bank |
| Epson | Virgin America |
| Fujitsu | Visa |
| **GE** | |
| **GM** | |
| **Honeywell** | |
| **HP** | |
| **IBM** | |
| Intel | |
| J. Paul Getty Trust | |
| Kaiser | |
| Learning Company | |
| Livescribe | |
| **Microsoft** | |
| Motorola | |

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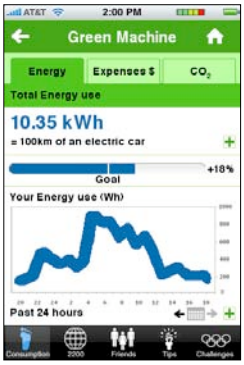


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## Energy, Pollution: We've Known the Issues for More than 30 Years

- **Visualizing Global (Energy) Interdependence**
  - East-West Center VGI Project, Honolulu, 1978
  - Used information visualization using tables, charts, maps, diagrams, without words
  - Multidisciplinary, multi-cultural research and development team
- Published VGI articles, showed presentation worldwide
  - Marcus, Aaron (1979). "Visualizing New Perspectives," *EWC* Magazine, 1978, pp. 18-24
  - Recent showing at Tama Art University, Tokyo, Japan, 2008

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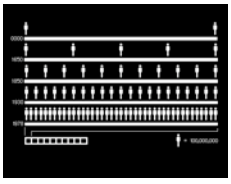
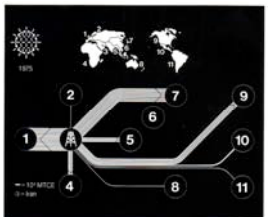
## VGI Presentation Examples



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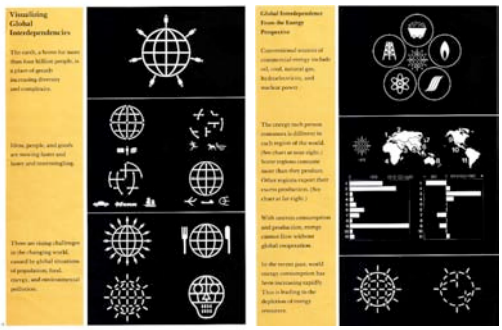
## VGI Publication Examples



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## What Do We Need?

- Information design and information visualization good
- But not good enough!
- What we need:
- **Persuasive Information Design *and* Information Visualization**

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## Where Should we Show this Persuasive Information?

- **Mobile devices**: Most important, effective
- 3 billion people worldwide use them
- Smarter, faster, cheaper, better, with built-in social networking and video
- Primary communication and interaction platform now and in future

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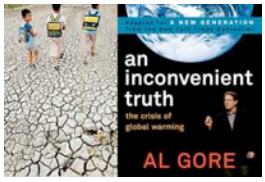
## Essential Challenge for Sustainable Development

- People know **data** but do **not change behavior**
  - Global warming: Frightening threat to Earth's future
  - Examples: **Al Gore**'s "An Inconvenient Truth", VGI project
- **Challenge**: How to help people reduce carbon footprint?

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## Household Energy Consumption: Some Background

- **With feedback, people can achieve 10% energy-consumption reduction without lifestyle change**
- 10% reduction in US: Total energy provided by US wind and solar, 113.9 billion kwh/year!
- US home consumption: 18% of $CO_2$ emission
  - Other sources: daily transportation, waste/recycling, eating/shopping
- US President Obama will invest $4.5 billion in **Smart Grid** to extend its use in US households
- Companies developing software using Smart Grid to help people monitor their energy consumption

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 29

## Utility Companies: Lessons Learned from Smart-Meter Tests*, 1/3

- Smart meters are more precise: more data to consumers but also to utilities, which can charge more for high-demand afternoons and less at night
- Drop in peak demand means utilities operate with fewer expensive plants: lower cost, less pollution
- Tests show: people cut consumption with higher peak-hour rates; but execs fear customers will think smart meters mean higher bills
- Only 5% of US meters currently smart (Feb 2010)

[*Smith,Rebecca, "What Utilities Have Learned from Smart-Meter Tests…", *WSJ*, 22 Feb 2010, R6]

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 30

## Utility Companies: Lessons Learned from Smart-Meter Tests*, 2/3

- Alternate approach to "stick": "carrot" of rebates to those who conserve in peak periods
- Utility execs fear rebellion: customers blame meters
- People don't understand smart meters and don't pay attention to rate changes
- "Needs to be a lot of consumer education"
- Results: High-rate threats -> 22-34, 16-23% home reduction (two different tests); 7% commercial
- Results: Rebates -> 9-15% reduction

[*Smith,Rebecca, "What Utilities Have Learned from Smart-Meter Tests…", *WSJ*, 22 Feb 2010, R6]

## Utility Companies: Lessons Learned from Smart-Meter Tests*, 3/3

- In effort to **change behavior**, one utility hesitated to use sticks (high rates) and chose carrots (rebates)
- One surprise to utility: customers with smart meters more satisfied with utility than those without:
  - Customers like meters: they gain insight into their energy use!
- Utilities hesitate to raise peak pricing until customers understand more, have smart appliances
- **AM+A takeaways:** Utilities miss some key issues
  - Misunderstand "behavior change", motivation, learnin
  - Miss opportunity to increase customer understanding, motivations)

[*Smith,Rebecca, "What Utilities Have Learned from Smart-Meter Tests…", *WSJ*, 22 Feb 2010, R6]]



## Current SmartGrid Software Good, But Not Good Enough

- Most SmartGrid software focuses on **data analysis**
  - Requires analysis of users' needs to understand which means enable them to improve eco-behavior
- Most SmartGrid software focuses on **PC**
  - Mobile phone apps match better use context and fit with other activities
  - Mobile phone apps offers ease-of-access and convenient use
  - Mobile phone apps always available, always on, at people's fingertips
- People's future ubiquitous platform: **Mobile phones**



## Green Machine: Persuasive Info Design and Info Visualization

- **Key challenge:** How can we persuade people to make behavior change?
  - Current SmartGrid software not designed for persuasive info and not designed for best platform
- **Solution: Green Machine** mobile phone app with user interface design that helps people reduce their household energy consumption



## Green Machine User-Interface Design Challenges

- **Usable**, **useful**, and **appealing**
- **Educate** users
- **Motivate** users to reduce household energy consumption
- **Persuade** users to change behavior



## Green Machine UI Analysis: User Profiles or Personas

- Later: business use
- Now: home use, general context, wider use
- Key users: Mom, Dad, Daughter, Son



## Green Machine UI Analysis: Use Scenario

- Mom/Dad wants to check energy consumption before running major appliance. She/he uses mobile phone to check current household energy consumption to learn recent history and check tips on lowering usage
- By lowering usage, she/he gains higher status in friends' energy-saving group, earns some rewards points, and helps save the Earth

## Behavior Analysis: Behavior Changing Process

- 5 steps of users' behavior-changing process through **Green Machine** application

| Increase frequency of using application | Motivate reduced energy consumption | Teach how to reduce energy consumption | Persuade users to reduce energy consumption | Persuade users to change behavior |
|---|---|---|---|---|
| • Usability<br>• Usefulness<br>• Appeal<br>• Rewards | • Link between users needs and motivation<br>• Competition and challenge<br>• Goal setting<br>• Persuasion issues (Fogg, Cialdini) | • Tips in context<br>• Social interaction with advice<br>• Consumption feedbacks related to the goal setting | • Frequent consumption feedback<br>• Social interaction (display information, improvements) | • Long term use |



## Information Design Features that Improve Use Frequency

- **Rewards:** When users log data, they gain points for for games/challenges, "greenies", or other rewards
- **User-centered design:** Gives application usable, useful and appealing user interface, which improves satisfaction and total user experience


[*US* Magazine, May 2009]



## Information Design Features that Improve Motivation, 1/6

- Sociobiological perspective motivation theory
  - People must understand: every action has influence on environmental change and Earth's future
  - Maximize reproductive success and ensure future of descendants
- **Earth in 2200**: Visual impact on future
  - High energy consumption: Polluted Earth with famine, low water/food, war
  - Low energy consumption: Healthier Earth with sufficient food, water, greater chance for peace



## Information Design Features that Improve Motivation, 2/6

- Psychological definition of motivation
  - Needs, wants, interests, desires propel people in certain directions
- **Maslow's Needs** can be source of motivations in UI
  - **Safety/Security**: Show how much money saved
  - **Self-actualization**: Show how much $CO_2$ released
  - **Belonging and being loved**: Show membership in eco-friendly community or to a team in Challenge (game) mode
  - **Esteem**: Show social comparison (with neighbors, friends) that display energy consumption or improvements



## Information Design Features that Improve Motivation, 3/6

- **Competition** and **challenge** improves motivation
  - Competition enhances motivation and reduces energy consumption
  - App must provide challenges and competition that people want
- Challenge to reduce household energy consumption takes into account factors such as points, ranking
  - Personal: Challenging other individual households
  - Social: Challenge teams, cities, or regions
  - All feature social interaction




## Information Design Features that Improve Motivation, 4/6

- **Goal setting** improves motivation
  - Helps people learn better, improves feedback relevancy
  - Encourages people, offering potential solution to long-term use

  [McCalley, L.T., Midden, C.J. (2002). "Energy conservation through product-integrated feedback: The roles of goal-setting and social orientation." *Journal of Economic Psychology,* 23, pp. 589-603]
- People can set their own goals
  - How much money do I want to save?
  - How much $CO_2$ do I want to release into atmosphere?
  - Want to be same eco-friendly consumer as friend Pat?
  - Want to know if I could win challenge in training camp?

## Information Design Features that Improve Motivation, 5/6

- **Fogg**'s "**Captology**" technology techniques make persuasion more effective and improve motivation
  - **Simulation:** Provide a "model" or "miniature"
  - **Reduction:** Simplify details to make users notice selected items
  - **Tunneling:** Predetermined event sequence facilitates key behaviors
  - **Customization:** Provide personally relevant info to increase interest
  - **Self-Monitoring:** Inform about progress to motivate behavior change
  - **Suggestion:** Intervene at right time to motive reacitng in a certain way
  - **Conditioning:** Use operant conditioning to reinforce target behaviors

[Fogg, B.J. (2003). ***Persuasive Technology**: Using Computers to Change What We Think and Do.* San Francisco: Morgan Kaufmann Publishers.
Fogg, B.J, and Eckles, Dean (2007), ***Mobile Persuasion**: 20 Perspectives on the Future of Behavior Change.* Palo Alto: Stanford Captology Media.]



## Information Design Features that Improve Motivation, 6/6

- **Cialdini**'s "**Weapons of Influence**" persuasion techniques make persuasion more effective and improve motivation
  - **Reciprocation:** People tend to return favors
  - **Commitment and consistency:** People committed, orally or in writing, to idea or goal, more likely to honor commitment
  - **Social proof:** People do thing they see others doing
  - **Authority:** People tend to obey authority figures, even if asked to perform objectionable acts
  - **Liking:** People easily persuaded by others they like
  - **Scarcity:** Perceived scarcity generates demand

[Cialdini, Robert (2001). "**The Science of Persuasion**," *Sci. Amer.*, 284:2, Feb. 2001, pp. 76-81 (www.influenceatwork.com)]



## Information Design Features that Improve Learning, 1/2

- **Contextual tips**
  - Explain how to reduce energy consumption in relevant context
  - Show other users tips that had success: products, services tried
  - Must be based on feedback
- **Social advice**
  - Social interaction has important impact on behavior change
  - Enabling people to send/read advice advantageous to user
- **Social networking**
  - Blogs, Forums, Facebook, Twitter
- **Suggestion Box**
  - Enables users to propose new ideas
  - Feature new sustainability concepts, sketches



## Information Design Features that Improve Learning, 2/2

- **Feedback about consumption**
  - Must be related to goal
  - Feedback must be relevant and more customized than only facts
- **Visual feedback**
  - Associated with goal setting for energy consumption
  - Contains positive or negative comments based on facts
- **Goals *vs.* practice**
  - Suggestions for change depend on difference between goal and current consumption level
  - High discrepancy example: Change lightbulbs
  - Low discrepancy example: Turn off sleep mode

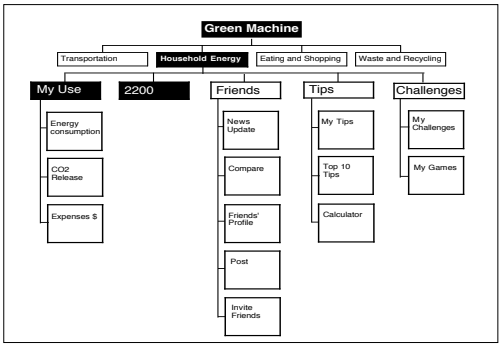


## Information Design Features that Reduce Consumption

- **Frequent feedback**
  - Promotes energy reduction
  - Special feedback for unusually low/high values
- **Daily Snaphots/Daily Diary**
  - Aided by relevant information
  - Examples: Energy consumption, difference from goals, money saved, Earth-image metaphor, social comparison, $CO_2$ release, etc.
- **Social interaction**
  - With information display, promotes energy reduction
  - Examples: Display user's consumption, improvements, ecological product purchase
  - Examples: Display user's energy consumption on Facebook or Twitter
  - Examples: View friends' energy consumption/improvements and add comments



## Green Machine Info Architecture



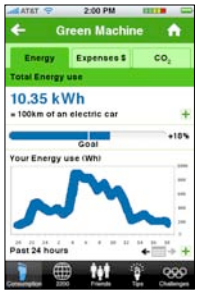
AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 49

## Initial Concept Sketch on i-Phone: Applications Screen

- **Consumption meter** (at top) shows current energy consumption as constant reminder
- **Application icon** (at bottom left) appears in list of all applications on home screen

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 50

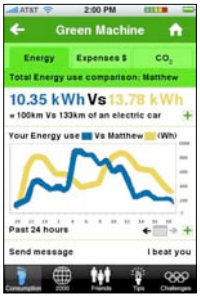
## Initial Concept Sketch on i-Phone: User's Energy Consumption




- **Multiple tracks:** multiple formats of info
- **Large text:** Shows recent net total
- **Small text:** Comparison
- **Thermometer chart:** recent net total re goal
- **Line chart:** Last 24-hours
- **Adjustable comparisons:** What? When?

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 51

## Initial Concept Sketch on i-Phone: Comparison, Competition




- **Send message**: User can send message to friend(s)
- **I beat you:** User can send friend short info of encourageement or triumph

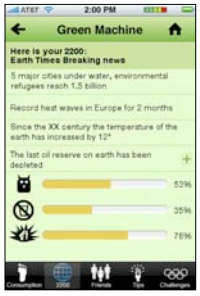
AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 52

## Initial Concept Sketch on i-Phone: User's Calendar (for all 3 sub-tabs)


- **Custom date selection:** filtered by Day, Week, Month and Year
- **Green goal indicators:** 3 small dots show how much you consumed and how well you met your goals
- Selected dates highlighted
- Selected dates summary

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 53

## Initial Concept Sketch on i-Phone: Year 2200 Preview




- **Year 2200:** Shows extrapolated impact of user's current consumption
- **News headlines:** Give impression of impact
- **Bar charts:** Show data of impact

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 54

## Initial Concept Sketch on i-Phone: Possible Friends Preview


- **Touch-sensitive chart:** when user circles chart, his/her friends' name highlighted
- **User Highlights:** shows user or specific friend's quick profile
- **Color circular chart:** Shows how green your friends are based on their behavior

## Initial Concept Sketch on i-Phone: Tips, Viewing Sketches


- Tips mapping
- 2 axes: Price and energy reduction
- Social interaction visualization
- Zoom in/out



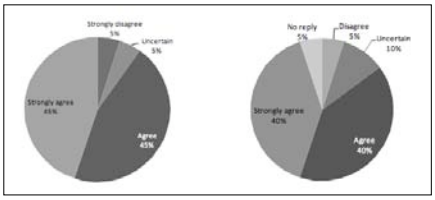
## Evaluation: User Tests, Interviews, and Redesign

- **User-experience evaluation**
  - Usability, usefulness, and appeal
- **Cross-cultural evaluation**
  - AM+A Best-of-Breed culture model: Context, technology, time perception, uncertain avoidance, time perception
  - Recent research proves impact of culture on Web, mobile UIs
- **Results evaluation**
  - Motivation and actual reduced energy consumption



## User-Test Analysis, 1/2

- 20 people, 18-65, men/women, students, adults
- Users positive re motivation, behavior change






## User-Test Analysis, 2/2

- 35% Favor Earth 2200 screen, despite neg info
- Navigation path changes: faster route to Friends
- Some icons needed improvement: “+” confusing



## Design Changes




## Green Machine: Conclusions

- Green Machine: proven motivation and persuasion
- Further R+D needed to complete full mental model and navigation
- Further R+D needed to complete interaction and appearance details
- Project ready to turn over to implementation sponsor in preparation for availability of Smart Grid
- Green Machine approach can be applied to other content, other platforms

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- Brejcha, Jan
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- Li, Eileen
- Millican, Crissy




## Green Machine: Project in Process

- **White Paper/presentation**
  - Summarizes and show results of user tests and explain impact on design of application and persuasion design
- **SmartGrid+mobile device demo**
  - Shows possible effective use of SmartGrid and mobile technology
- **Persuasive information + design/visualization**
  - Shows impact of well-designed mobile Smart-Grid apps to help reduce energy consumption
- **Resources**
  - AM+A bibliography of culture, culture dimensions, mobile technology



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## Green Machine: Event History

- DD4D, 19-20 June 2009, Paris: GM/VGI Lectures
- *User Experience* (UX), 8.4, November 2009: Green Machine article
- World Usability Day, 13 Nov 09, Moscow, U-Lab: Webinar Lecture
- *Information Design Journal*, 2010: Green Machine article
- DD4D *Proceedings*, 2010: Green Machine article
- More to come…



## Green Machine: Mobile Decision Displays to Promote Eco-Action


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# A Modest Proposal: Customized Currency

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# US Deficit/Debt is Skyrocketing

- US Federal deficit 2010: $1.4 trillion (estimate)
- US Federal debt 2010: $12.4 trillion (estimate)
- US Federal debt: about $40,000 per person
- President, Congress, politicians, media, and public all debate ways to reduce both deficit and debt
- China currently largest foreign holder of US debt
- Challenge: to tax wealthy individuals and corporations, not middle class or poor

[Debt: http://defeatthedebt.com/?gclid=CL2IoYu17p8CFQwTawodB1uMcg;
Population: http://www.census.gov/main/www/popclock]

# Simple Solution: Vanity Bucks

- US Treasury Department decides: OK to print images of living people (or deceased) on US currency, even non-citizens
- US Treasury Department decides: OK to print logos of corporations and organizations on US currency, even multinationals or foreign companies organizations
- Graphic-design solution to deficit/debt problem
- Price: **$100 million per image**!
- 4000 images: $400 bilion added to US Treasury every few months

# Facts and Figures

- Richard Garriott paid $30m for 10-day space ride
- Stephen Colbert's "Nation": $100 x 1m people
- 4,000 images: $400 billion = 35% of US deficit!
- Limited image duration: constant new revenue
  - 3b $1 bills last about 21 months in circulation
  - 500m $100 bills last 5 years in circulation
  - Possible trade-offs in price *vs.* duration *vs.* currency value
- Currency design primarily unchanged
  - US Treasury can solve counterfeiting protection, ensure ATMs work
- Additional revenue from authorized, signed copies

# Example: Wealthy Individuals or Support Organizations

- Pres. Obama, Bill Gates, Warren Buffet, Stephen Colbert, Oprah Winfrey, Tom Cruise, Pres. Sarkozy (FR), Pres. Hu (CN), Prime Minister Putin (RU)

# Possible Firsts

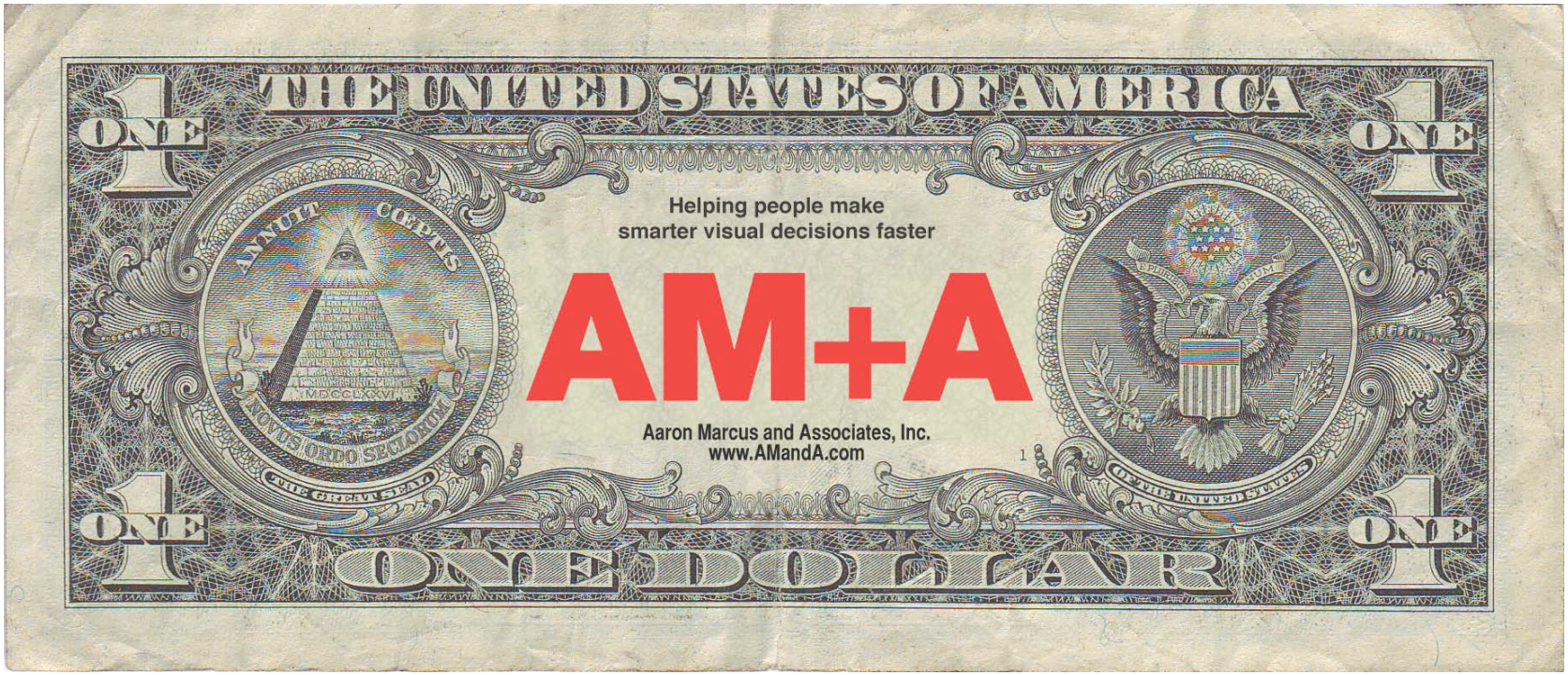
- First African-American to appear on US currency
- First woman to appear on US currency
- First foreigner to appear on US currency
  - “Hu’s on first?”
- “Pet names” or new slang for currency
  - ’Bama Bucks, Colbert Cash
  - “That’ll cost you three Putins and an Oprah”

# Example: Wealthy Grandparents

- Grandparents love to show off their grandchildren
- Surprise wedding gift for future spouse?!

# Example: Corporate Logos

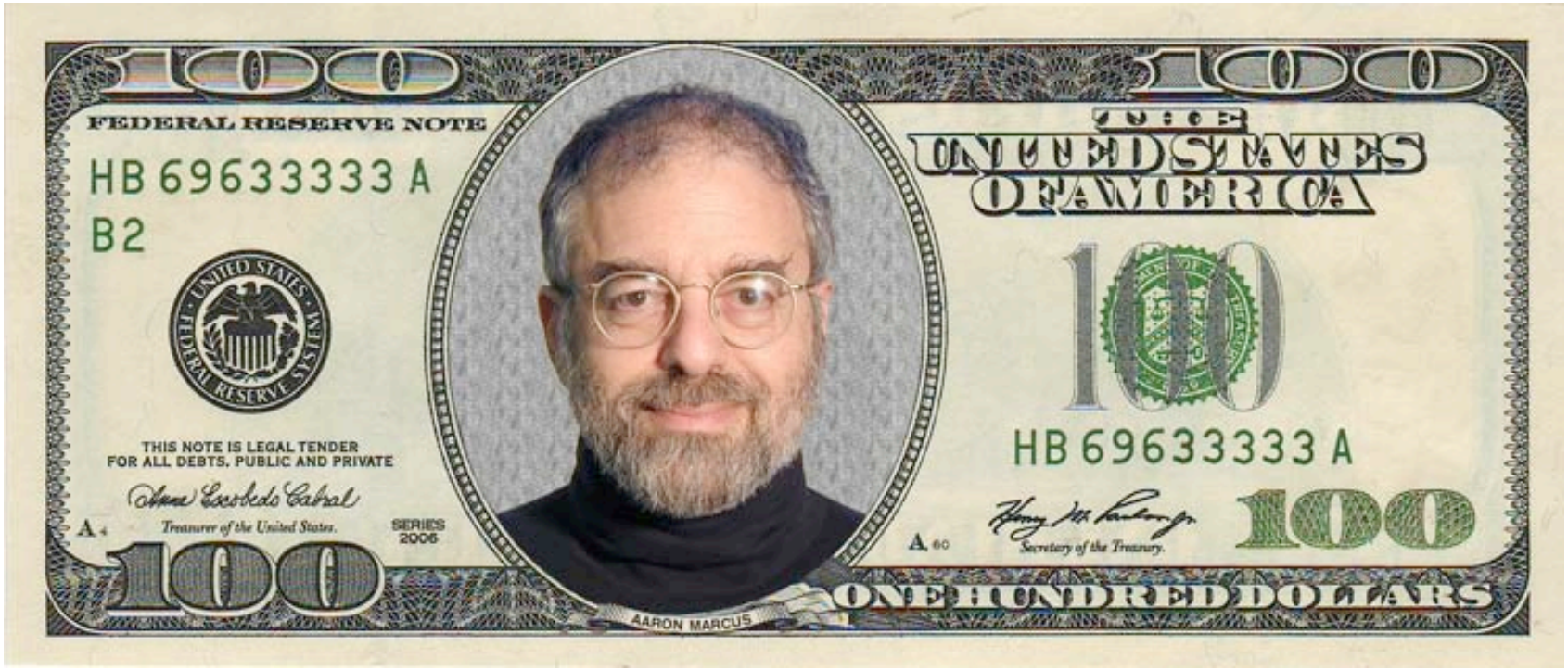
- Microsoft, Apple, Google, Fujitsu; Ford, BMW, Toyota, Ford; Proctor-Gamble, ConAgra



# Full Proposal at Website of American Institute of Graphic Arts

- **http://www.aiga.org**/content.cfm/modest-proposal-customized-currency
- Earlier publication of idea in *San Jose Mercury News*, 4 January 2009
- Proposal sent to President Obama, Stephen Colbert, US Treasury Department: no reply…:-(…
- Do your part to start a grass-roots movement: Save America with Vanity Bucks!…:-)…
- Contact US Treasury Dept or www.BoingBoing.com

# A Modest Proposal: Customized Currency

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