AM+A

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Experience Design Intellilgence
User-Interface Development
Information Visualization

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

Course Handout Notes
SIGGRAPH 2010 Asia
Seoul, South Korea
15 December 2010

Aaron Marcus, President
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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, and UPA, and business/university workshops around the world. He co-authored *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 is an advisor to the AIGA Center for Cross-Cultural Design since 2004.

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 28 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, McKesson, Microsoft, Motorola, NCR, Nokia, Oracle, Peoplesoft, 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, and Microsoft's ThreeDegrees.com.

Agenda for the Tutorial

Session 3: 14:15-16:00
Break: 16:00-16:15
Session 4: 16:15-18:00

Time	Topic
14:15	**Workshop begins**
14:15-14:30	Lecture 0: Introduction to Content and Speaker
14:30-15:15	Lecture 1: Culture Dimensions and UI Design
15:15-15:45	Lecture 2: Culture and Corporate Web Design
15:45-16:00	Lecture 3: Best of Breed Culture Dimensions
16:00-16:15	**Break for Refreshments**
16:15-16:30	Lecture 4: Applying Cultural Models to UI Design
16:30-16:45	Lecture 5: Culture UI Testing Case Study
16:45-17:15	Lecture 6: Culture and Mobile UI Design
15:15-17:30	Lecture 7: Web 2.0 UI Design and Culture
17:30-17:45	Lecture 8: Social Network Sites and Culture
17:45-18:00	Closing Discussion: Time permitting
18:00	**Tutorial ends**

Detailed Descriptions and Allocation of Time

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: Cultural Dimensions and UI Design (45 minutes)
Illustrated lectures will introduce culture theories, models, and 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.

Lecture 2: Culture and Corporate Web Design (15 minutes)
We shall show extensive examples of culture differences among international corporate Websites that promote a consistent user-interface design. These examples will demonstrate the power of culture to affect even corporate "universal" standards. We shall examine several major businesses and consumer Websites for multi-national corporations from several countries (USA: McDonald's, Coke; Korea: Samsung; Germany: Siemens) and discuss the apparent tradeoffs of "universal" vs. localized solution for user-interface components per culture dimensions. A culture model was used to analyze variations in user-interface components of corporate global Website designs for approximately a dozen companies, both B2B and B2C, including Siemens, Peoplesoft, McDonalds, and Coca-Cola.

Lecture 3: Best-of-Breed Culture Dimensions (15 minutes)
This lecture discusses a survey of 60 professional analysts of culture and user-interface design, which resulted in a composite set of 19 culture dimensions and the top five that emerged from the study to serve as a practical set for culture analysis of user interfaces.

Lecture 4: 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 5: 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 6: Mobile UI Design and Culture (30 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.

Learning Objectives and Abstract

Learning Objectives

Participants will learn new terms and concepts to understand culture theory, models, and dimens. 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 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 pen-and-paper exercises, where time permits.

Tutorial Slides, Publications, and Bibliographies

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

Aaron Marcus and Associates, Inc.
Presentation

Lecture:
Introduction to Aaron Marcus and Associates, Inc.

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

Aaron Marcus, President
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Web: www.AMandA.com

Objectives

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

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

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

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

Publications: Book Covers

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Publications: Chapters in Books

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Publications: UX and Interactions

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 9

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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Some Past and Current Clients

13 of 30 Dow Jones Industrial Average™ Firms

Am Express	**Microsoft**
AT&T	Motorola
Bank of America	Nokia
BMW	Oracle
Cisco	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	

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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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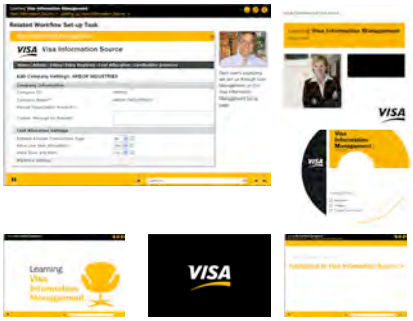
Visa: Visa Information Source, 1/2



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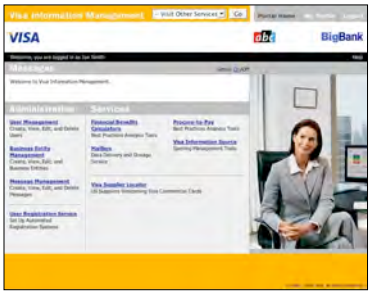
Visa: Visa Information Source, 2/2



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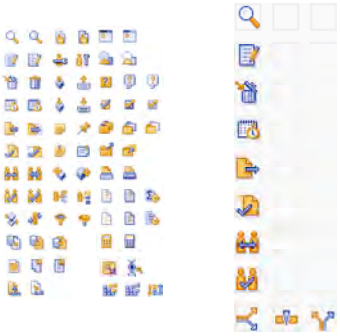
Visa: Icons



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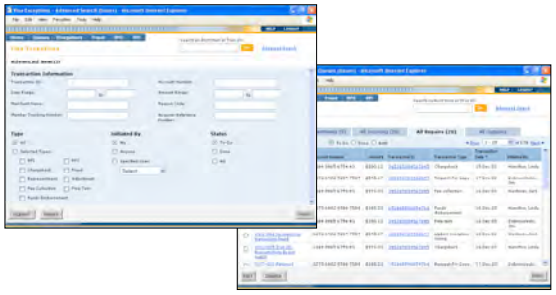
Visa: Exceptions Reporting UI Design



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Visa: Visa.com Global Gateway Usability Analysis and Strategy

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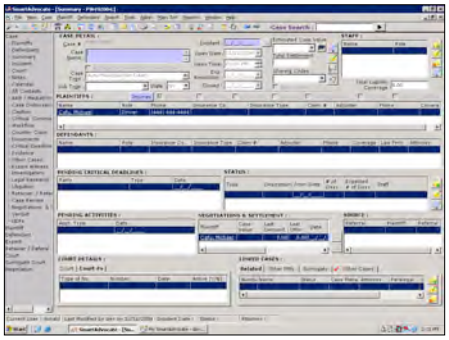
Legal Case Management: Before



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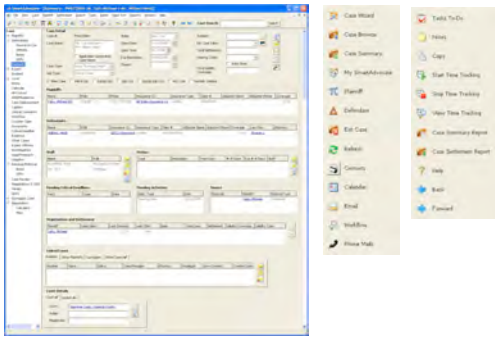
Legal Case Management: After



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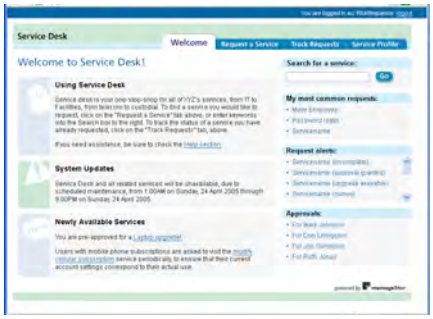
IT Services Management Portal, 1/2



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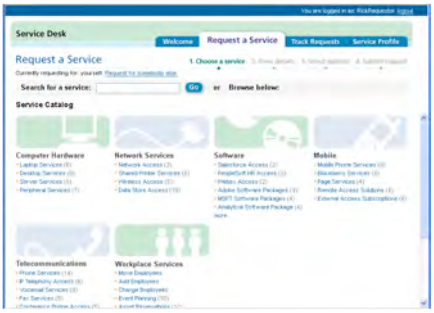
IT Services Management Portal, 2/2



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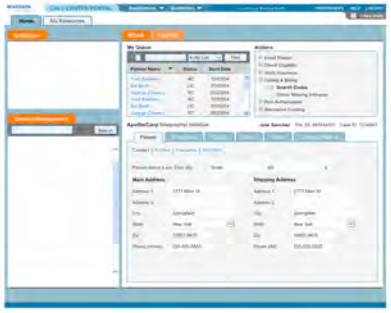
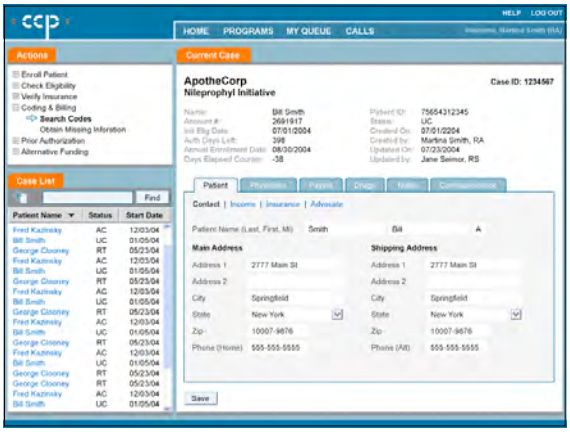
McKesson Call Center Portal, 1/3





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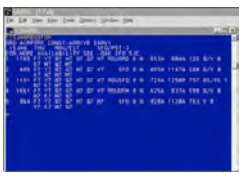
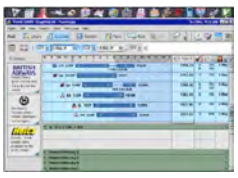
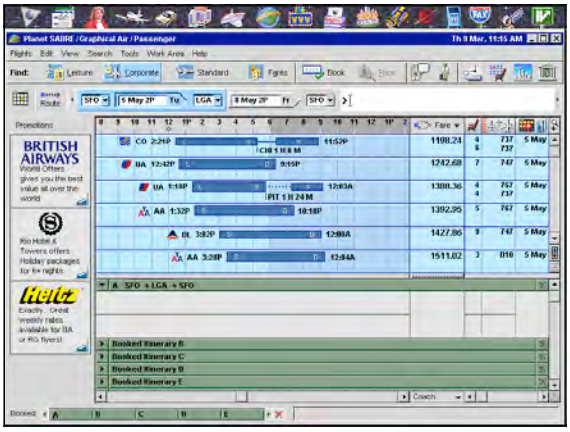
Application Example: Sabre Travel Booking Development



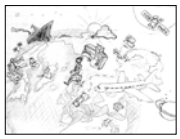
Before

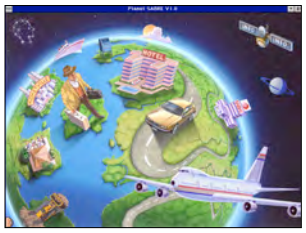


After

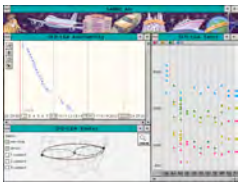


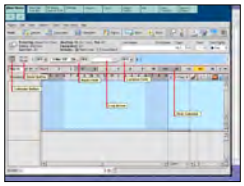
Sabre: Launch Screen Development





Sabre: Information-Visualization and User-Interface Design


Information Visualization

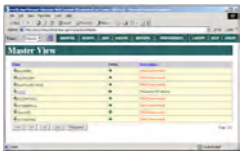

Interactive UI Guidelines

Sabre: Wayfinder Game Development

Orbitz: User Research

- User research and focus group testing to determine optimum design of flight data search results

Web Application: NetIQ Development



Before


After

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

Home Page

Visitor Guide Page

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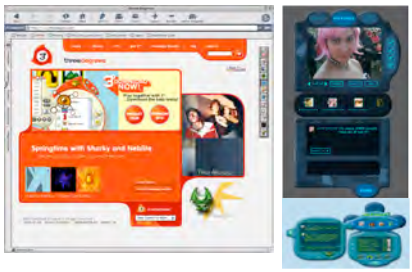
www.ThreeDegrees.com: Web-based Messaging, File-Sharing for Teens



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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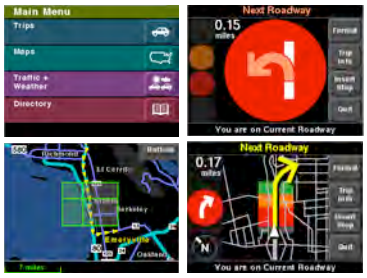
Mobile Products: Motorola Smart-Car User-Interface Design



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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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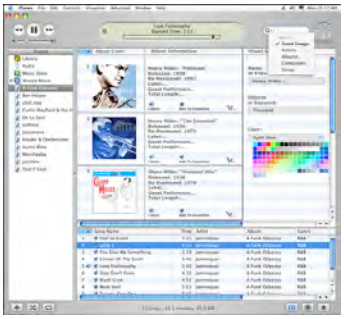
Visual Search via Album Art



- 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

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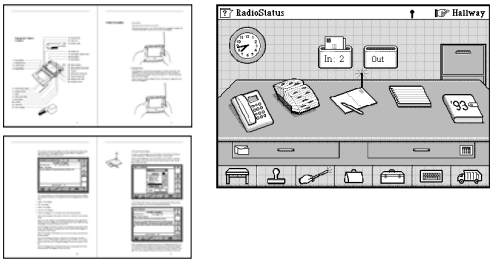
Paper Prototypes: Motorola Personal Messenger User Manual



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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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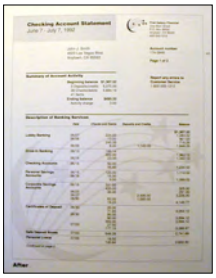
Documentation and Training: Xerox Font Center Sales Literature


Before


After

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Education: Tiscali European Web Portal on European Hand Gestures

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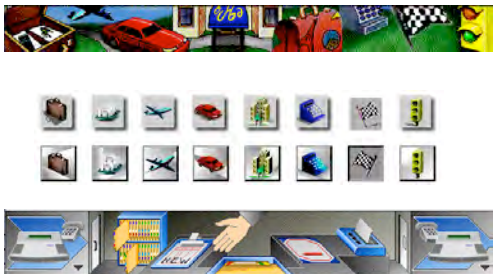
Icon Designs, 1/3



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Icon Designs, 2/3

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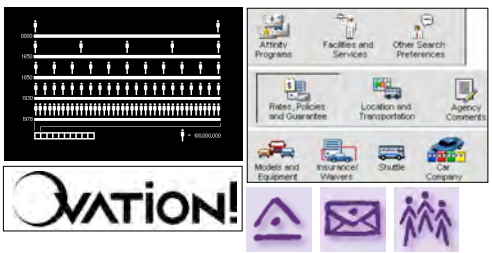
Icon Designs, 3/3, Logo



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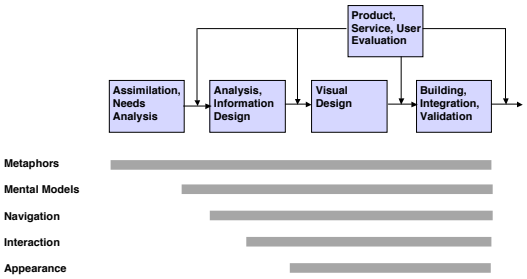
Our Process



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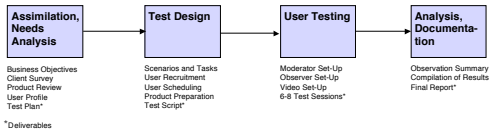
Our Testing Process



*Deliverables

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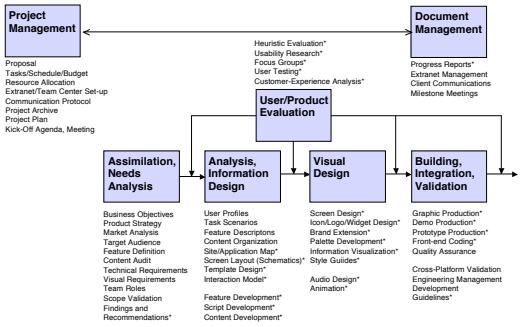
Our Deliverables*



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Design Process Artifacts

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User Research

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User Models, User Profiles

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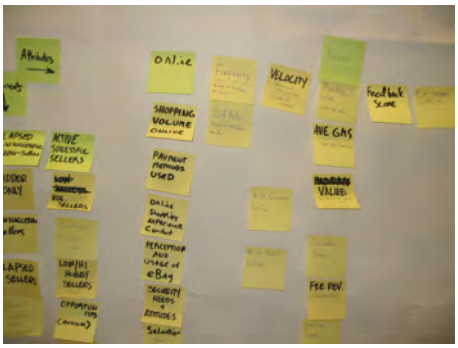
Participatory Design



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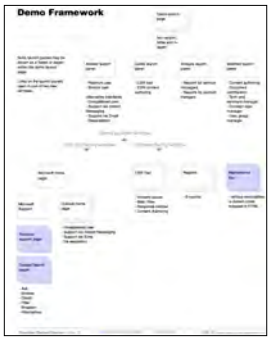
InfoArchitecture Diagram: Framework



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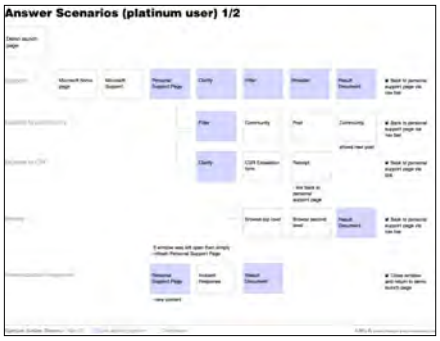
InfoArchitecture Diagram: Scenarios



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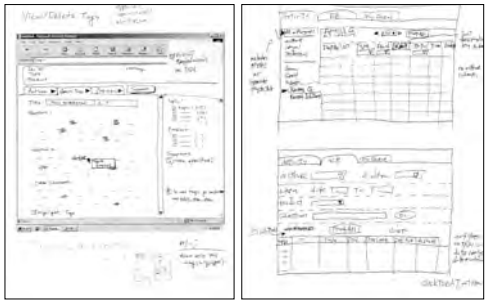
UI Design Sketches



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Schematics

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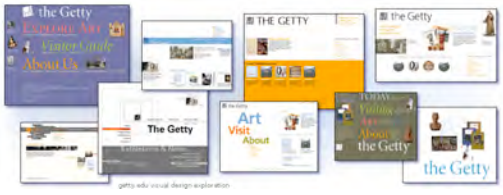
Visual Design Exploration



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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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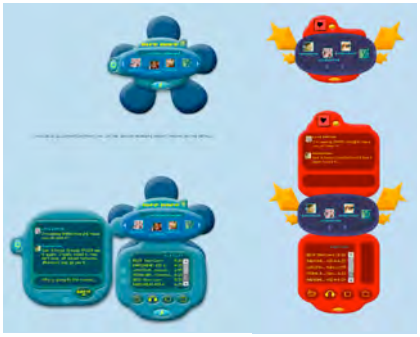
Visual Design Examples



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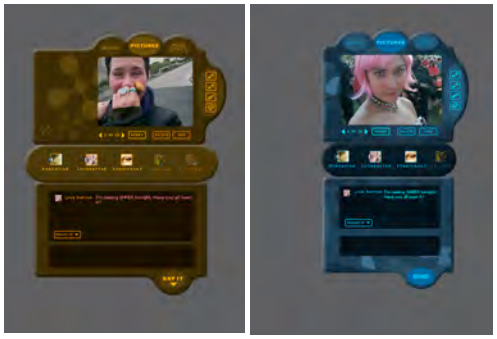
Visual Design Examples



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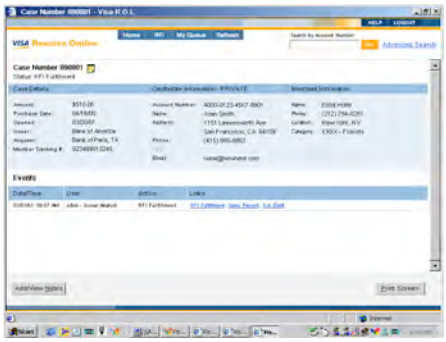
Visual Design: Examples



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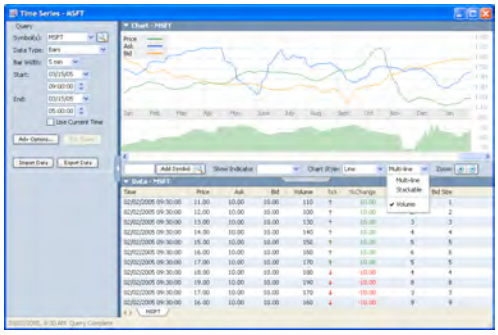
Visual Design: Examples



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Visual Design: Examples

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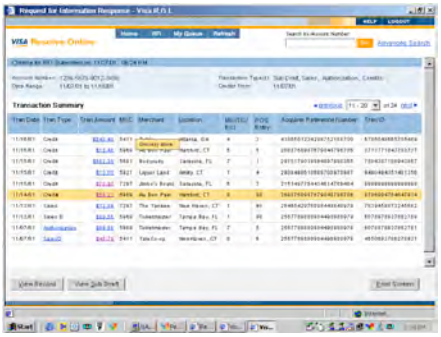
Visual Design: Examples



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Visual Design: Examples

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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

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Web: www.AMandA.com

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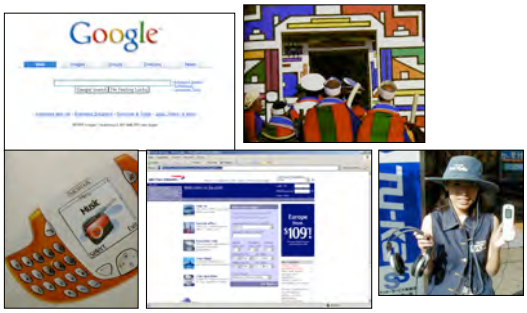
Cross-Cultural User-Interface Design for Work, Home, and On the Way



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Cross-Cultural User-Interface Design for Work, Home, and On the Way: Accounting for Cultural Preferences, Acceptance, and Constraints

Aaron Marcus, President
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Web: www.AMandA.com

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Presentation Summary

- 1. Introduction
- 2. Definition of Globalization
- 3. Globalization Design Process
- 4. Dimensions of Culture
- 5. Cultural Analysis of the Web
- 6. Conclusion

Acknowledgements: Dr. Geert Hofstede, Institute for Research on Intercultural Affairs, Maastricht, The Netherlands; Prof. Emilie W. Gould, Empire State College, NY; Dr. Pia Honold, Siemens Corporation.

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1. Introduction

- E+M-Commerce: Global distribution of products, services
- User diversity: Demographics and individual needs/wants
- User-interface design: Improves performance and appeal
- User-interface design issues: Complex and challenging

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Culture Quiz: Which button position signifies that the lights are On?

- Culture affects what we notice, know, do, and feel

See: Oshlyansky, Lidia; Thimbleby, Harold; Cairns, Paul (2004). "Breaking Affordance: Culture as Context." NORDICHI 2004, Tampere, Finland , ACM Conf. *Proceedings* , Vol. 82, pp. 81-84. UK: Down = Off; USA Down = On.

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Culture Quiz: Would you Feel Lost?

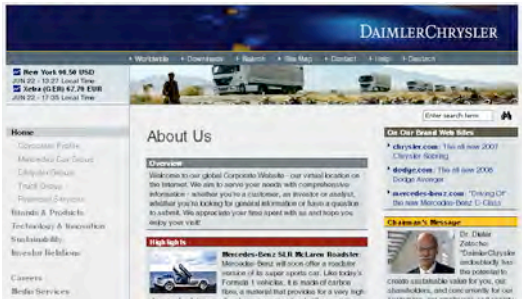
- In movie "Black Robe" (1991), 17th-century French priest feels lost in Canadian forest, kneels to pray before dying… until interrupted by his Native-American companions who pass him by, ask him what in the world he is doing?!
- Would you notice the "street signs," or even the "streets"?


User-Interface and Information-Visualization Design

- 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
  - Visualizations of structures and processes
  - Abstract vs. representational
  - Classical: Tables, forms, charts, maps, diagrams
  - Innovations: Hyperbolic browser, Tree maps, Table lens

In a trans-global economy, should every Website look like this?

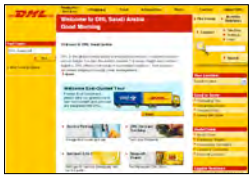
In a trans-global economy, should every Website look like this?



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.]

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.]

Searching on the Web: Google *vs.* Baidu

- Sometimes copying has cultural caché

USA: Google.com

China: Baidu.com

- Copying is itself a cultural characteristic and issue
  - See Stille, Alexander (2002). "The Culture of the Copy and the Disappearance of China's Past," Chap. 2, in *The Future of the Past*. New York: Farrar, Straus, and Giroux, pp. 40-70.

Arabia On.Line

Arabia On.Line Update: 2000 *vs.* 2007

Example: A Present from India

Example: Food-Shopping Menus

2. Definition of Globalization

- Globalization issues and UI+IV Design:

  International: Standard,"universal;" ready for localization

  Intercultural: Differences, and similarities, between two cultures

  Localization: Customized, part or whole

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 Hom, Devi,
Liquid Comics, Bangalore, 2006
Exhibit at LACMA, 1109-0210

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International Issues

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

Singapore Drug Laws

Apple iLife Website Country/Language Switcher

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Intercultural

- Religious, historical, aesthetic:
  - Example: Calendars, Le weekend = Thu/Fri in some Moslem states
  - Example: 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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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

- 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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3. Globalization Development Process

- **Plan:** Include GD issues in all steps
- **Research:** Investigate sets of users
- **Analyze:** Determine key criteria, targets
- **Design:** Visualize alternatives
- **Implement:** Use tools that facilitate variations
- **Evaluate:** Test prototypes with user sets
- **Document:** Include GD guideline, specs
- **Train:** Consider appropriate techniques
- **Maintain:** Consider local needs

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Topics of General Guidelines for Globalization

- User demographics
- Technology
- Metaphors
- Mental models
- Navigation
- Interaction
- Appearance

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Guidelines Example: Appearance Details for Color

- Follow perceptual guides for legibility, warm/cool, 5±2 variations
- Respect national, cultural, religious usage
  - Sacred examples: White/blue/gold (Western) vs. green/blue (Arab) vs. yellow (Buddhist)
- Use warning/danger colors (yellow/red)
- Consider attitudes toward high- vs. low-chroma (pastel) colors

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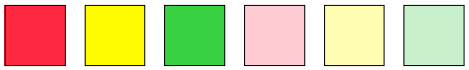
Example: Color Sets

- 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: Political Colors

- USA
  - Blue/red = liberal/conservative states
- International
  - Iran: Pink = advocates of women's rights/reforms
  - Ukraine: Orange = pro-West
  - Lebanon: Cedar = anti-Syrian independence-minded Lebanese
  - Iraq: Voters in first free elections (with upraised finger)

Vinciguerra, T. (2005). "The Revolution Will be Colorized," *New York Times*, 13 March 2005, WE-12.

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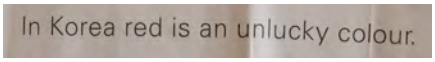
Aesthetics: Dionysus/Apollo

- Cultural preferences exist for layout, textures, patterns, colors
- Europe/USA/Chinese/Japanese/Indian architecture, painting, sculpture exhibit them
- 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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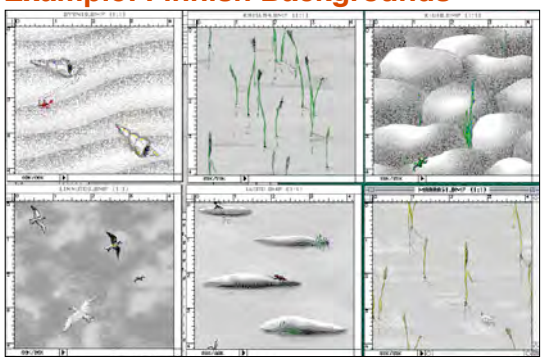
Example: Finnish Backgrounds



4. Dimensions of Culture

- Theorists
- Hofstede's theory of cultural dimensions
- Cultural issues

Culture Theorists

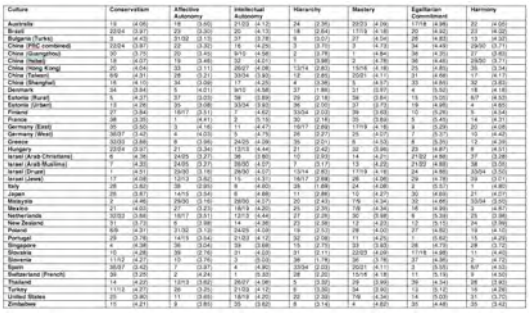
- Benedict,Ruth, *Patterns of Culture*, 1939
- Hall, Edward: Context and time
- Hofstede, Geert: 5 dimensions for 50+ countries
- Kluckhohn and Strodtbeck: Value orientations
- Schwartz, Shalom H.: 7 dimensions for 39 countries
- Trompenaars Fons (including Parson's Pattern Variables): *Riding the Waves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

Schwartz: 7 Orthogonal (not Polar) Dimensions for 37 Countries

- Conservatism
- Affective autonomy
- Intellectual autonomy
- Hierarchy
- Mastery
- Egalitarian commitment
- Harmony

[Schwartz, Shalom H. (1994). "Beyond Individualism/Collectivism: New Cultural Dimensions and Values." In *Individualism and Collectivism: Theory, Method, and Applications*, Kim, Uichol; Triandis, Harry C.; Kagitcibasi, Cigdem; Choi, Sang-Chin; and Yoon, Gene, Eds. Thousand Oaks, CA: Sage, p. 85-119.]

Schwartz' 7 Dimensions, 39 Countries



[From Shalom H. Schwartz, "Beyond Individualism/Collectivism: New Cultural Dimensions of Values." In *Individualism and Collectivism: Theory, Method, and Applications* edited by Uichol Kim, Harry C. Triandis, Cigdem Kagitcibasi, Sang-Chin Choi, and Gene Yoon. Thousand Oaks, CA: Sage Publications, 1994, 85-119.]

Victor, Hall, Trompenaars: Theoretical Bases

- Structure of language and culture
- Context: Focus on verbal/ nonverbal communication; information in explicit code or in physical environment
- Time: Focus on past/ present/ future; one/ many things at a time
- Additional existential dimensions

Geert Hofstede's Cultural Dimensions

- *Cultures and Organizations: Software of the Mind*, Geert Hofstede, McGraw-Hill, 1997, with Gert Hofstede, 2005
- Hofstede examined IBM employees in 50 countries, 1978-83; analyzed statistical data; 74 countries in 2005
- Culture: Patterns of thinking, feeling, acting programmed by a particular group, not "refinement of the mind," civilization
- Culture differences: symbols, heroes, rituals, values

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Hofstede's 5 Dimensions of Culture

- 1. Power-distance
- 2. Collectivism vs. individualism
- 3. Femininity vs. masculinity
- 4. Uncertainty avoidance
- 5. Long- vs. short-term orientation

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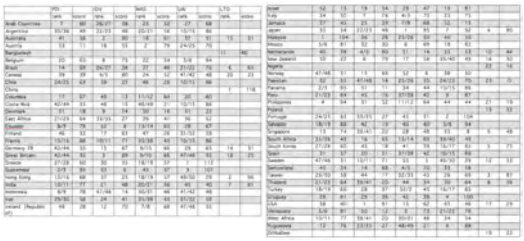
Hofstede: Dimensions, Countries



[From: 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.]

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4.1. 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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Power Distance in National Cultures

".. with its very old historical roots, [PD] is likely to survive for a long time yet, at least for some centuries. A worldwide homogenization of mental programs about power and dependence, independence, and interdependence under the influence of a presumed cultural melting-pot process, is still very far away, if it will ever happen." (C+O, p. 47)

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Implications for Global UI 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)
  - Malaysian sites compared by Gould et al, IEEE *Proc.*, 2001
- Netherlands (PDI = 38; 40/53)
  - www.ichthus-rdam.nl (Ichthus Hogeschool)
  - www.tue.nl (Technische Universiteit Eindhoven)

Examples: Universities, 2000

- Universiti Utara Malaysia
- Ichthus Hogeschool
- Technische Universiteit Eindhoven

Examples: Universities, 2007

- Universiti Utara Malaysia
- Ichthus Hogeschool
- Technische Universiteit Eindhoven

Examples: University Home Pages

Examples: University Home Pages

Examples: University Home Pages

Examples: University Home Pages

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Examples: University Home Pages

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Examples: University Home Pages

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Examples of PD Index (PDI) in Web

Contrasting University Websites 2003:

- Panama (PDI = 95)
  - www.utp.ac.pa (Universidad Tecnológica de Panamá)
- Netherlands (PDI = 38; 40/53)
  - www.tue.nl (Technische Universiteit Eindhoven)

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 56

Examples: University Home Pages

Universidad Tecnológica de Panamá, 2003

Technische Universiteit Eindhoven, 2003

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 57

Examples: University Home Pages

Universidad Tecnológica de Panamá, 2007

Technische Universiteit Eindhoven, 2007

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 58

Examples: University Home Pages

Univ. Tecnológica de Panamá, 2003, Panama PD = 95

Examples: University Home Pages

Univ. Tecnológica de Panamá, 2007, Panama PD = (95)

Examples: University Home Pages

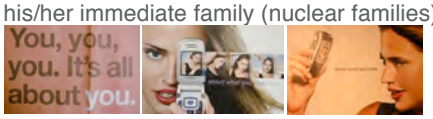
Techn. Univ. Eindhoven, 2003, Netherland PD = 38

Examples: University Home Pages

Techn. Univ. Eindhoven, 2007, Netherland PD = (38)

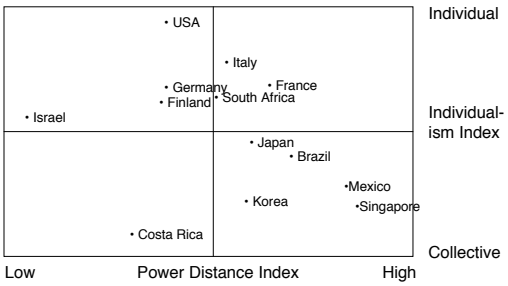
4.2. Individualism vs. Collectivism in Societies

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



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

Power Distance vs. Individualism-Collectivism



Examples of Individualism vs. Collectivism

- **Work:** Personal time, freedom, challenge vs. training, physical conditions, use of skills
- Extrinsic vs. intrinsic motivation at work: Conditions, material rewards vs. work itself
- **Family:** Honesty/truth vs. harmony
  - Talking vs. not talking
  - Guilt cultures vs. shame cultures
  - Self-respect vs. face

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 66

Key Differences: Individualism

- Individual soc/econ interests over collective
- Right to privacy; private opinions expected
- Laws and rights same for all
- Restrained state in economy; high GNP/capita
- Political power of voters; press freedom
- Individual self-actualism = ultimate goal
- Ideology of freedom

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 67

Key Differences: Collectivism

- **Collective soc/econ interests** over individuals'
- Groups rule private life/opinions, laws/rights
- **State controls press, economy, politics**
- Harmony and consensus = ultimate goals
- Ideology of equality

["Trying to Evade the Censors," Tiananmen Square Twitter examples, *NYT*, 4 June 2009, p. A10]

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 68

Implications for Global UI Design: Individualism

- Focus on maximizing personal achievement ("Expect the extraordinary")
- Materialism and consumerism demonstrate individual success
- Controversial/ argumentative speech and extreme claims encouraged ("truth")
- Images of youth/ activity rather than age/ wisdom ("doing," not "being")

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 69

Implications for Global UI Design: Collectivism

- Individual roles downplayed (e.g. product shown on its own); focus may be on group
- Personal goals often intrinsic
- Preference for socially supportive and constrained claims; controversy discouraged because of its tendency to divide people (relationships, not truth)
- Respect for tradition (historical focus)

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 70

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)

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 71

Examples: Website Home Pages

↑ USA Glacier Bay National Park

→ Costa Rica National Parks

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 72

Examples: Website Home Pages

USA Glacier Bay National Park, 2007

Costa Rica National Parks, 2007

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 73

Examples: Website Home Pages

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 74

Examples: Website Home Pages

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 75

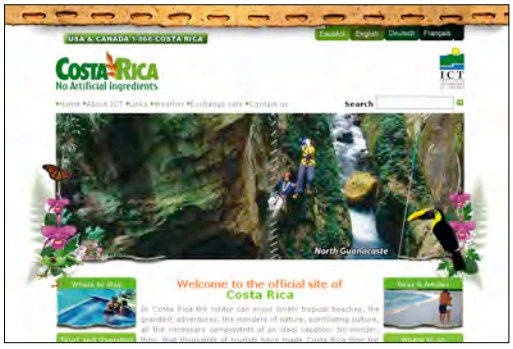
Examples: Website Home Pages

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 76

Examples: Website Home Pages

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 77

Examples: Website Home Pages



Examples of Individualism/ Collectivism on the Web

National Parks 2003:

- Individualism: United States (IDV = 91; highest rating)
  - www.nps.gov (National Park Service)
- Collectivism: Panama (IDV = 11; 51/53)
  - www.panamatours.com/Rainforest/Rainforest_intro.htm (Panama National Parks)

Examples: Website Home Pages

Panama National Parks, 2003

National Park Service US, 2003

Examples: Website Home Pages

Panama National Parks, 2007

National Park Service US, 2007

Examples: Website Home Pages

Panama National Parks, 2003, Panama IDV = 11

Examples: Website Home Pages

Panama National Parks, 2007, Panama IDV = (11)

Examples: Website Home Pages

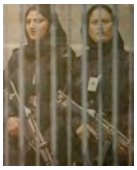
National Park Service US, 2003, US IDV = 91

Examples: Website Home Pages

National Park Service US, 2007, US IDV = (91)

4.3. Gender Roles: Femininity vs. Masculinity

- Distinction: Genders *vs.* gender roles
  - Generally: Assertiveness *vs.* modesty
- Traditional Gender Roles
  - Men: Assertive, competitive, tough
  - Women: Home/children, people-oriented, tender



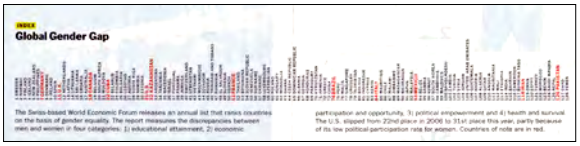
[*Time*, 12 Apr 04, p23; *The Hindu*, 28 Mar 04, p1]

Masculinity vs. Femininity

- Masculinity: Distinct gender roles
  - Men: assertive, tough, focused on material success
  - Women: modest, tender, concerned with quality of life
- Femininity: Gender roles overlap
  - Both men and women = modest, tender, concerned with quality of life

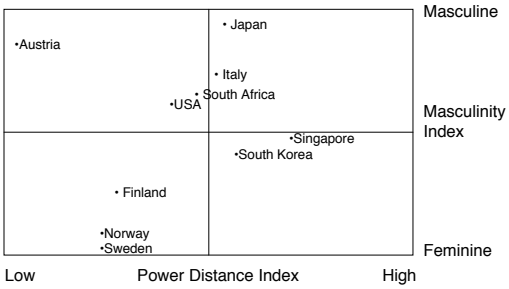
Gender Role (Masculinity) Index Values for Selected Countries

95 Japan	47 Israel
79 Austria	43 France
62 USA	39 South Korea
53 Arab countries	05 Sweden



[*Time*, 26 November 2007, pp. 8-9]

Power Distance vs. Masculinity



Traditional Masculine Work Goals

- Earnings
- Recognition
- Advancement
- Challenge

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 91

Traditional Feminine Work Goals

- 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: Have security and be able to work for as long one wishes

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 93

Implications for Global UI Design: Masculinity

- Traditional gender/ family/ age distinctions emphasized; work tasks/ roles given preference
- Mastery most important; Websites designed for exploration and control
- Games/ competitions held grab attention
- Artwork may be utilitarian/ instrumental

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 94

Implications for Global UI Design: Femininity

- Gender/ work roles blurred
- Mutual exchange and support more important than mastery; Website should be task-oriented and provide quick results for limited task
- Poetry/unifying values may focus attention
- Natural images, traditional art, soft focus used to generate emotional/aesthetic appeal

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 95

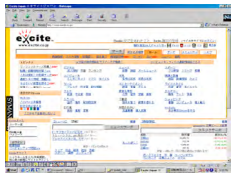
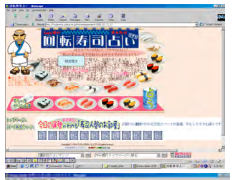
Examples of Masculinity/ Femininity on the Web

Gender-oriented sites:

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

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 96

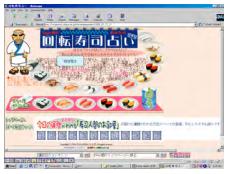
Excite/Japan for Males, Females


- Male: Cars and stocks information, sushi-based horoscopes
- Female: Pale colors and recipes

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 97

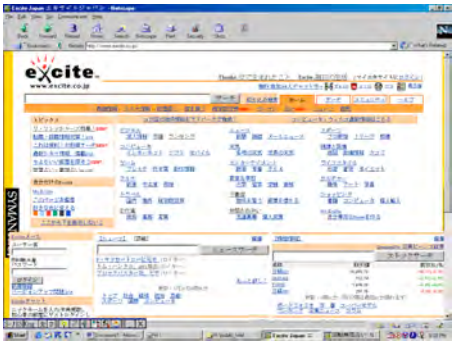
Excite/Japan: Males, Females, 2000


- Male: Cars and stocks information, sushi-based horoscopes
- Female: Pale colors and recipes

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 98

Excite/Japan: Males, Females, 2000

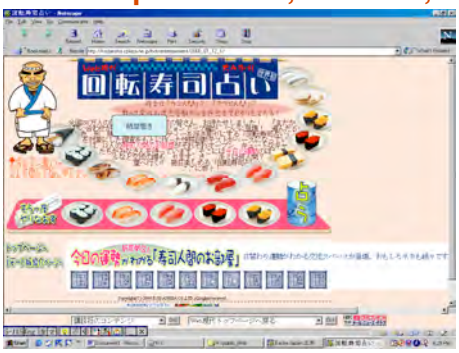


AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 99

Excite/Japan Males, Females, 2007

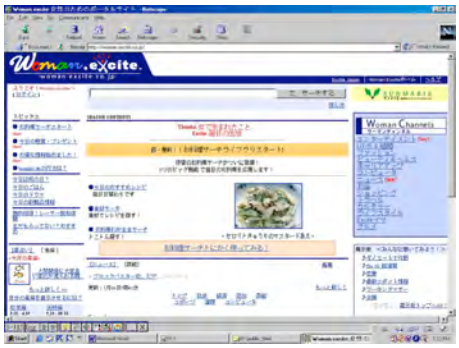
AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 100

Excite/Japan: Males, Females, 2000



AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 101

Excite/Japan: Males, Females, 2000



AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 102

Excite/Japan: Males, Females, 2007

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 103

USA and Sweden

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

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 108

Examples of Masculinity/ Femininity on the Web

Gender-oriented sites 2003:

- Masculinity: Japan = 95 (highest MAS)
  - www.excite.co.jp - women's site
  - www.nike.jp/women - nike women's site
- US = 52 (15/53)
  - www.nike.com
- Femininity: France = 43 (35+36/53)
  - www.excite.fr
- South Korea = 39 (41/53)
  - www.nike.co.kr

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 109

Excite for Males, Females

- Japan: Male/General
- Japan: Female
- France: General

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 110

Excite for Males, Females

- Japan: Male/General
- Japan: Female
- France: General

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 111

Excite for Males, Females

Excite Japan, 2003, Japan MAS = 95

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 112

Excite for Males, Females

Excite Japan, 2007, Japan MAS = (95)

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 113

Excite for Males, Females

women.excite.co.jp, 2003, Japan MAS = 95

Excite for Males, Females

women.excite.co.jp, 2007, Japan MAS = (95)

Excite for Males, Females

Excite France, 2003, France MAS = 43

Excite for Males, Females

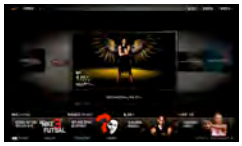
Excite France, 2007, France MAS = (43)

Nike for Males, Females

- Japan: Male/General
- Japan: Female
- Korea: General

Nike for Males, Females

- Japan: Male/General
- Japan: Female
- Korea: General



Nike for Males, Females

Nike Japan, 2003, Japan MAS = 95

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Nike for Males, Females

Nike Japan, 2007, Japan MAS = (95)

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 121

Nike for Males, Females

Nike Japan, 2003, Japan MAS = 95

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 122

Nike for Males, Females

Nike Japan, 2007, Japan MAS = (95)

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 123

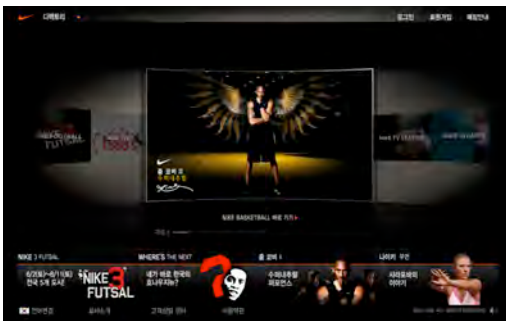
Nike for Males, Females

Nike Korea, 2003, Korea MAS = 39

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 124

Nike for Males, Females

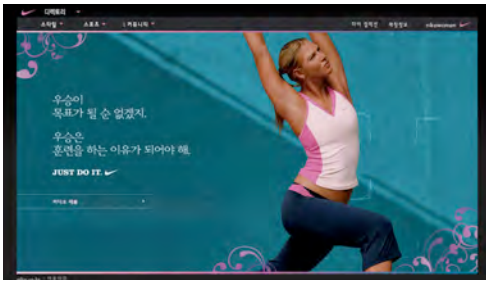
Nike Korea, 2007, Korea MAS = (39)



AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 125

Nike for Males, Females

Nike Korea, 2007, Korea MAS = (39)



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4.4. 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 = variant of uncertainty avoidance

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Low Uncertainty-Avoidance Countries, 1/2

- Quiet, easy-going, indolent, controlled, lazy. (subjective view)
- What is different is curious (or ridiculous)
- Schools: students respect plain language, accept teacher who says, "I don't know"
- Definitions of clean/dirty; safe/dangerous differ widely by country
- UA index positively related to age, not occupation or gender

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 131

High Uncertainty Avoidance Countries, 1/2

- People seem busy, emotional, aggressive, active (subjective view)
- Shun ambiguous situations; look for structure in organizations, institutions, and relations that make events clearly interpretable and predictable
- Prepared to engage in risky behavior to reduce ambiguities, like starting a fight, instead of waiting
- Positive relation: high uncertainty avoidance (in developed country) and maximum highway speed

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 132

High Uncertainty-Avoidance Countries, 2/2

- Equate dirty and dangerous tightly
- "Cultures with [high] uncertainty avoidance *need* categories of dangerous others to defend themselves from" (can lead to racism)
- What is different is dangerous
- Schools: Expect teachers to be experts with all the answers

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High Uncertainty Avoidance in School: German Example

- Favors structured learning situations with precise objectives, detailed assignments, strict timetables, situations with one correct answer to be found, rewards for accuracy, teachers as experts with all the answers, cryptic, academic language, parents as audience, not consultants

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 134

Low Uncertainty Avoidance in School: British Example

- Dislike too much structure, one correct answer situations; like open-ended learning, vague objectives, broad assignments, few timetables, rewards for originality, teachers who use plain language (and accept a teacher who says, I don't know), parents involvement.

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Implications for Global UI Design: High UA

- Keep it simple
- Results/ implications of actions need to be revealed
- Make attempt to prevent looping/ becoming "lost in cyberspace"
- Constraints/ task animations/ models should be used to reduce "user error"
- Carefully encode meaning through multiple redundant cues

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Implications for Global UI Design: Low UA

- Complexity and risk valued: don't protect users from failure
- Less effort put into controlling navigation
  - Links open new windows
  - OK to take people out of original site
- Help system focuses on information; task orientation secondary
- Coding of color/ shape/ texture cues used to maximize information; need not be redundant

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 140

Examples of Uncertainty Avoidance on the Web

Airline Companies:

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

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 141

Examples: Airline Home Pages

Sabena

British Airways

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Examples: Airline Home Pages

Sabena (pre-bankruptcy) British Airways

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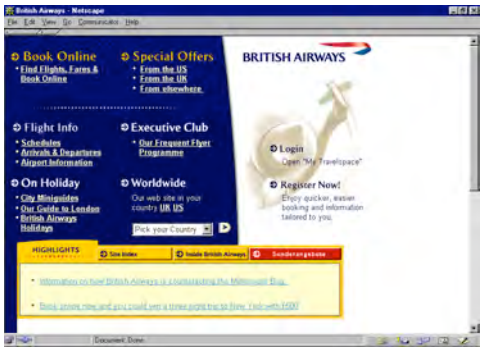
Examples: Airline Home Pages

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 144

Examples: Airline Pre-Bankruptcy

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 145

Examples: Airline Home Pages



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Examples: Airline Home Pages, 2007

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 147

Examples of Uncertainty Avoidance on the Web

Airline Companies 2003:

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

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 148

Examples: Airline Home Pages

Sabena

British Airways

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 149

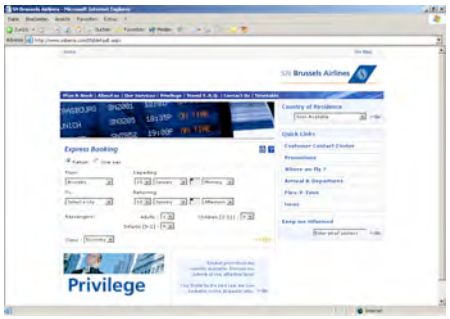
Examples: Airline Home Pages, 2007

Sabena (Bankrupt)

British Airways

Examples: Airline Home Pages

Sabena, 2003, Belgium UA = 94



Examples: Airline Home Pages

British Airways, 2003, United Kingdom UA = 35

Examples: Airline Home Pages

British Airways, 2007, United Kingdom UA = (35)

Comparison of UA for 2003 Websites

- 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 survives design improvements!

4.5. Long vs. Short Term: Confucian Dynamism

- 1. Stable society requires unequal relations
- 2. Family is prototype of all social organizations
- 3. Virtuous behavior to others = not treating others as one would not like to be treated
- 4. Virtue re one's task in life = trying to acquire skills and education, working hard, being frugal, being patient, persevering

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

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

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 156

Virtue vs. Truth

- Rokeach Value Survey (RVS) vs. Chinese value survey (CVS)
- "…the Indian and the Chinese minds seem to take a position different from the Western one when it comes to the need for defining Truth."
- Search for truth (belief-oriented) vs. search for virtue (practice-oriented)

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Comparing Studies of Culture

- Three dimensions appear across all cultures: power distance, individualism-collectivism, masculine-feminine
- Fourth dimension depends on culture:
  - Western: UA = search for truth
  - Eastern: Confucian dynamism, or long- term orientation = search for virtue

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 158

Implications for Global UI Design: Long-Term Orientation

- Practice more important than theory
- Accomplishing the task sufficient; expertise not required
- Personal network provides resources for achievement

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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

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 160

Examples: Germany and China

Siemens Germany

Siemens China

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 161

Examples: Germany and China, 2007

Siemens Germany

Siemens China

Examples: Siemens Germany, 2000

Examples: Siemens Germany, 2007

Examples: Siemens China, 2000

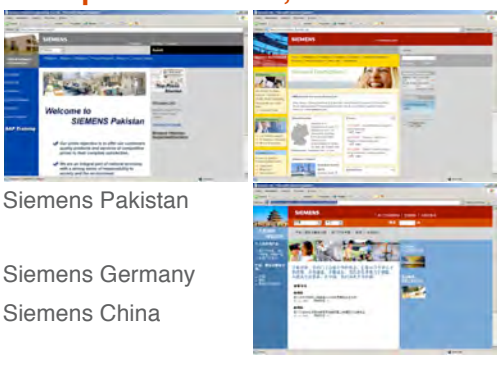
Examples: Siemens China, 2007

Examples of Long/short-term time orientation on the Web

Siemens 2003:

- Pakistan = 0 (lowest LTO)
  - www.siemens.com.pk
- Germany = 31 (14/23)
  - www.siemens.com/de
- China = 118 (highest LTO)
  - www.siemens.com.cn

Examples: Siemens, 2003



- Siemens Pakistan
- Siemens Germany
- Siemens China

Examples: Siemens, 2007

- Siemens Pakistan

- Siemens Germany
- Siemens China

Examples: Siemens Pakistan, 2003

Siemens Pakistan, 2003, Pakistan LTO = 0

Examples: Siemens Pakistan, 2007

Siemens Pakistan, 2007, Pakistan LTO = (0)

Examples: Siemens Germany, 2003

Siemens Germany, 2003, Germany LTO = 31

Examples: Siemens Germany, 2007

Siemens Germany, 2007, Germany LTO = (31)

Examples: Siemens China, 2003

Siemens China, 2003, China LTO = 118

Examples: Siemens China, 2007

Siemens China, 2007, China LTO = (118)

Examples of Long/short-term time orientation on the Web

Hitachi 2003:

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

Examples: Hitachi

Hitachi Germany, 2003 Hitachi China, 2003

Examples: Hitachi Germany, China, 2007

Hitachi Germany, 2007 Hitachi China, 2007

Examples: Hitachi China, 2003

Hitachi China, 2003, China LTO = 118

Examples: Hitachi China, 2007

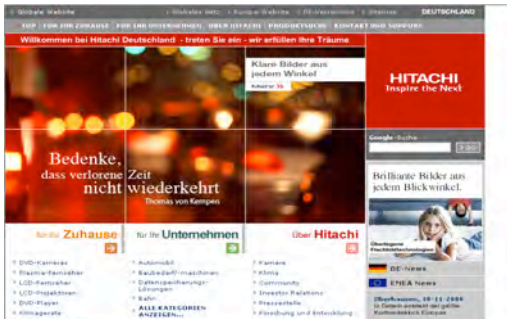
Hitachi China, 2007, China LTO = (118)

Examples: Hitachi Germany, 2003

Hitachi Germany, 2003, Germany LTO = 31

Examples: Hitachi Germany, 2007

Hitachi Germany, 2007, Germany LTO = (31)



Summary: China *vs.* Germany

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

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.
- Lee, Ook, "The Role of Cultural Protocol in Media Choice in a Confucian Virtual Workplace," *IEEE Transactions on Prof. Comm.*, Vol. 43, No. 2, June 2000, pp. 196-200.
- Choong, Salvendy and Jack Caroll, study of Chinese/US mental models

Where do We Go from Here?

- New sources of insight
- Action within corporations and societies
- Action in the world

Additional Sources of Insight

- Additional dimensions to consider
  - Persuasion
  - Trust
  - Intelligence
  - Personality
  - Cognition
  - Emotions
- How do culture dimensions relate to these additional dimensions
- How do culture dimensions relate to user-interface components?

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Dimensions of Persuasion

- Reciprocation
- Consistency
- Social validation
- Liking
- Authority
- Scarcity

Robert Cialdini, "The Science of Persuasion," *Sci. Amer.*, Vol, 284, No. 2, Feb. 2001, pp. 76-81 (www.influenceatwork.com)

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 187

Dimensions of Trust

- Attraction: Attractive people trusted more
- Dynamism: Activity, e.g., moving hands, text
- Expertness: Relevant skills
- Faith: Belief in predictable future
- Intentions: Revealed objectives and goals
- Localness: Presumed similar values, behavior
- Reliability: Dependable, predictable, consistent

Bailey, Gurak,and Konstan, "An Examination of Trust Production in Computer-Mediated Exchange," Human Factors and the Web 2001 Conference, http://www.optavia.com/hfweb

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Dimensions of Intelligence

- Verbal/Image comprehension
- Word/image fluency
- Numerical/graphical fluency
- Spatial visualization
- Associative memory
- Perceptual speed
- Reasoning
- Image: Self/Other awareness

Gardner, *Frames of Mind*, 1985

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Dimensions of Personality

- Agreeableness: Attitudes toward other people
  - Trust, honesty, altruism, cooperation, modesty, sympathy
- Extroversion: Energy, enthusiasm around others
  - Outgoing, sociable, assertive, energy, enthusiasm, excitement seeking
- Neuroticism: Emotional reaction to pressure, stress
  - Anxiety, irritability, depression, self-consciousness, moodiness, stress
- Conscientiousness: Organized, persistent in goals
  - Efficient, orderly, dutiful, achievement-oriented, self-disciplined, careful
- Openness: Open to and interested in culture
  - Imaginative, artistic, broad interests, curious, intellect., unconventional

[Source: Dr. Samuel D. Gosling, Psych Res Fndtn, U of TX, *NYT*, 010305, C1]

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Even Cognition Culture-Biased?

- Nisbett, et al: Basic patterns of thought are cultural
- **Western: objects,** individual distinctiveness; "rational" logic, categories, causation; tunnel-vision
- **Eastern: relations** (harmonious social); inter-dependence, simultaneous conflicts; wide-angle
- Tests conducted on Japanese, USA participants

[Nisbett, Richard E., Kaipeng Penkg, Incheol Choi, and Ara Norenzayan (2001). "Culture and Systems of Thought: Holistic vs. Analytical Cognition," *Psychological Review,* 108, 291-310.
Nisbett, Richard E. (2003). *The Geography of Thought: How Asians and Westerners Think Differently…and Why.* New York: Free Press.]

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Chinese *vs.* American Use of Metaphors, Mental Models

- USA: Inferences, categories; classify by functions, analyze components, infer common features
- Chinese: relations, contexts: classify by interde-pendence within wholes, rely on subjective ex-perience without sharp difference of self/others, facts/concepts
- Longer performance times for Chinese with USA organization, and similarly for USA with Chinese

Source: Choong and Salvendy, *Int Jour of HCI*, 1999

Example: Contrasting Sorting Styles

Sorting by thematic groupings

Kitchen
- Cooking
  - Microwave, rice cooker, ...
- Cleaning
  - Dishwashing liquid, scouring pad, ...
- Small appliances
  - Toaster, blender, coffee maker, ...
- Food handling
  - Sandwich bags, paper plates, ...

Bedroom
- Bedding ...
- Appliances ...
- Clothing ...
- Dresser ...

Bathroom ...

Sorting by Function

Appliances
- Major
  - Microwave ...
- Small
  - Toaster, blender, …
- Laundry
  - Washer,…
- Personal
  - Shaver,…

Home/personal fashion
- Bedding ...
- Brushing ...
- Bathing …

Cleaning ...

Paper/plastic products ...

Resulting Differences: Thematic vs Functional Info Structures

- Lower error rates for USA with functions, for Chinese with thematic structures
- Better memory performance for Chinese with thematic
- Better performance (speed, accuracy) time for Chinese using thematic
- Better performance for Chinese using concrete metaphors

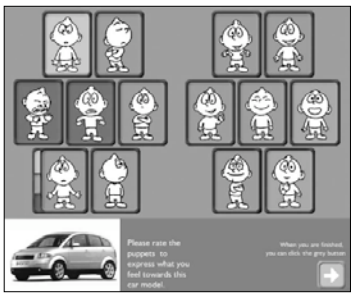
Ref: Carroll, John M., "Using Design Rational to Manage Culture-Bound Metaphors for International UIs," IWIPS 99, *Proceedings, p 125-131.*

Dimensions of Emotions

- Biological emotions (arousal, reward-punishment, fear/anger, love/bonding): based upon specific neurochemical systems
- Social emotions (pride, guilt, etc.): Based biologically upon attachment
- Cognitive emotions (interest, boredom, curiosity): Based biologically upon expectancy
- Moral emotions: based upon a combination of social attachment and expectancy

[Typology of Emotions, Ross Buck, U of CT, 2002, http://wattlab.coms.uconn.edu/ftp/users/rbuck/UConn9-00/sld001.htm]

Emotion Measuring Tool



- Desmet, Pieter, *Designing Emotions*, 2002 ISBN 90-15877-4, Info@DesigningEmotion.nl

Research Paradigms in Emotional Message Design

Research Paradigm	Expressive	Conventional	Rhetorical
Emotion/communication relationship	Emotion is focus; communication is byproduct	Communication is focus; emotion is content of message	Managing social life is goal; emotion communication is integral part
Metaphors(s)	Container	Playing catch	Dancing
Communicative goal	None	Accuracy	Social coordination
Skill needed	None, unless bottled up	Normal,but some better than others	Potentially highly skilled
Expressions studied	Spontaneous	Posed or spontaneous	Socially situated
Typical model of emotion	Categories	Categories or dimensions	Processes
Verbal/nonverbal link	Link is epiphenomenal; emphasis on nonverbal	Mutually compatible or competing	Multifunctional,flexible
Typical research	Emotion(s) as independent variable; cue(s) as dependent variable(s)	Cue(s) as independent variable(s), accuracy as dependent variable	Social goal(s) as independent variable(s); emotional message(s) as dependent variable(s)
Research problems	Experimental control, highly individualistic	Issue of what counts as accuracy, manipulating cues	Complexity; no clear boundaries
Research possibilities	Body movement, verbal	Evolving interpretations, under-standing, empathy	Effects on social variables

Source: Planalp, Sally, and Knie, Karen (Univ. of Montana), "Integrating Verbal and Nonverbal Emotion(al) Messages, in Fussell, Susan R. (2002). *The Verbal Communication of Emotions: Interdisciplinary Perspectives.* Mahway, New Jersey: Lawrence Erlbaum, p. 57.

URLs (as of April 2003) and Publications about Emotion Theory

- URL: Typology of Emotions, Ross Buck, U of CT: http://wattlab.coms.uconn.edu/ftp/users/rbuck/UConn9-00/sld001.htm
- Philosophy of emotions and faces:http://philsciarchive.pitt.edu/documents/disk0/00/00/06/04/PITT-PHILSCI00000060400/Machiavellian_Emotions.pdf
- Faces and emotions: http://www.paulekman.com/
- Fussell, Susan R. (2002). *The Verbal Communication of Emotions: Interdisciplinary Perspectives.* Mahway, New Jersey: Lawrence Erlbaum

Research Objective: Map Culture Dimensions to UI Components

	Metaphors	Mental Model	Navigation	Interaction	Appearance
Power Distance					
Individualism vs. Collectivism					
Masculinity vs. Femininity					
Uncertainty Avoidance					
Long-Term Time Orientation					

Culture vs. UI : Power Distance, 1/2

- Metaphors
  - **High:** Institutions, buildings with clear hierarchy: schools, government, monuments, *etc.*
  - **Low:** Institutions, buildings with equality, options: Summerhill, play/games, public spaces, *etc.*
- Mental Models
  - **High:** Reference data with no relevancy ranking
  - **Low:** Less structured data with relevancy
- Navigation
  - **High:** Restricted access, choices; authentication; passwords
  - **Low:** Open access, multiple options, sharable paths

Culture vs. UI: Power Distance, 2/2

- Interaction
  - **High:** Severe error messages: “Entry Forbidden,” “You are wrong;” wizards or guides lead usage
  - **Low:** Supportive error messages, cue cards
- Appearance
  - **High:** Images of leaders, nations; official music, anthems; formal speech
  - **Low:** Images of people, daily activities; popular music; informal speech

Culture vs. UI: Individualism vs. Collectivism, 1/2

- Metaphors
  - **Individualist:** Action-oriented, tools
  - **Collectivist:** Relationship-oriented
- Mental Models
  - **Individualist:** Product- or task-oriented
  - **Collectivist:** Role-oriented
- Navigation
  - **Individualist:** Individual paths; popular choices, celebrity choices; stable across roles; customizable
  - **Collectivist:** Group-oriented, official choices; changes per role

Culture vs. UI: Individualism vs. Collectivism, 2/2

- Interaction
  - **Individualist:** Keyword searches; active-oriented; multiple devices; customizable;
  - **Collectivist:** Limited, official devices; role driven
- Appearance
  - **Individualist:** Images of products, people; low context; hyperbolic, dynamic speech; market-driven topics, imagery, language; customizable; direct, active verbs
  - **Collectivist:** Images of groups, organizations; images of roles; high context; official, static terminology; institution-driven topics, imagery, language; passive verbs

Culture vs. UI: Masculinity vs. Femininity, 1/2

- Metaphors
  - **Masculine:** Sports-oriented; competition-oriented; work-oriented
  - **Feminine:**Shopping carts; family-oriented
- Mental Models
  - **Masculine:** Work/business structures; high-level, “executive views;” goal-oriented
  - **Feminine:** Social structures; detailed views; relationship-oriented
- Navigation
  - **Masculine:** Limited choices, synchronic
  - **Feminine:** Multiple choices; multi-tasking, polychronic

Culture vs. UI: Masculinity vs. Femininity, 2/2

- Interaction
  - **Masculine:** Game-oriented; mastery-oriented; individual-oriented
  - **Feminine:** Practical, function-oriented; co-operation-oriented; team oriented
- Appearance
  - **Masculine:** "Masculine" colors, shapes, sounds
  - **Feminine:** "Feminine" colors, shapes, sounds; acceptance of cuteness

Culture vs. UI: Uncertainty Avoidance, 1/2

- Metaphors
  - **High:** Familiar, clear references to daily life; representation
  - **Low:** Novel, unusual references; abstraction
- Mental Models
  - **High:** Simple, clear articulation; limited choices; binary logic
  - **Low:** Tolerance for ambiguousness, complexity; fuzzy logic
- Navigation
  - **High:** Limited options; simple, limited controls
  - **Low:** Multiple options; varying, complex controls

Culture vs. UI: Uncertainty Avoidance, 2/2

- Interaction
  - **High:**Precise, complete, detailed input and feedback of status
  - **Low:** General, limited, or ambiguous input and feedback of status
- Appearance
  - **High:** Simple, clear, consistent imagery, terminology, sounds; highly redundant coding
  - **Low:** Varied, ambiguous, less consistent imagery, terminology, sounds

Culture vs. UI : Power Distance

- Metaphors
  - **High:** Institutions, buildings with clear hierarchy: schools, government, monuments, *etc.*
  - **Low:** Institutions, buildings with equality, options: Summerhill, playgames, public spaces, *etc.*
- Mental Models
  - **High:** Reference data with no relevancy ranking
  - **Low:** Less structured data with relevancy
- Navigation
  - **High:** Restricted access, choices; authentication; passwords
  - **Low:** Open access, multiple options, sharable paths

Culture vs. UI: Long-Term Orientation, 1/2

- Metaphors
  - **Long:** Stable family, Father: Mafia,Chinese state businesses, IBM in 1950s
  - **Short:** Interchangeable roles, jobs, objects
- Mental Models
  - **Long:** Love/devotion; social coherence, responsibility, support
  - **Short:**Liberty: socialincoherence, social irresponsibility, efficiency
- Navigation
  - **Long:** Tolerance for long paths, ambiguity; contemplation-oriented
  - **Short:** Bread-crumb trails, taxonomies; quick-results; action-oriented

Culture vs. UI: Long-Term Orientation, 2/2

- Interaction
  - **Long:** Preference for face-to-face communication, harmony; personalized messages; more links to people; live chats; interactio0n as "asking"
  - **Short:** Distance communication accepted as more efficient; anonymous messages tolerated; conflict tolearated, even encouraged; performance criticalr communication
- Appearance
  - **Long:** Cultural markers: flags, colors, national images; soft focus; warm, fuzzy images; pictures of groups inviting participation, suggestions of initimacy and close social distance
  - **Short:** Minimal and focused images; shart borders, lines, edges; concentaaion on showing task or product

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5. Survival in a Multicultural World, 1/2

- Hofstede calls for some cultural relativism: no absolute criteria for low, noble activities
- No human being can escape from using value standards all the time; otherwise, no identity



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Survival in a Multicultural World, 2/2

- No need to think, feel, act identically to agree on practical issues and to cooperate
- People with high UA and high PD will be more difficult, slower
- Research shows little evidence for cultural convergence
- Differences among and within countries increasing

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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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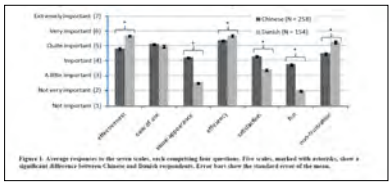
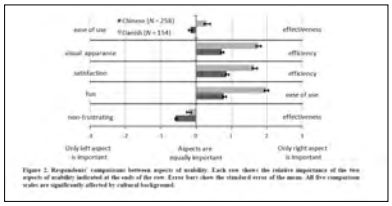
Usability and Culture: China *vs.* Denmark





["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]

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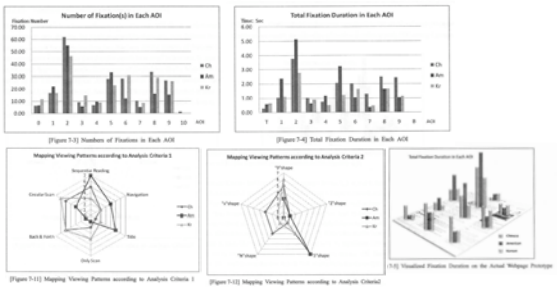
China, Korea, and US Differences of Web-Page Viewing



[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.]

UI Issues related to Culture Dimensions: 1/4

- Usability culture-biased? Efficiency, productivity, simplicity, usefulness...for what?
- How to merge theories: culture with utility, sociability, community, entertainment, design?
- How to map UI components to culture dimensions?
- How can developers include cultural theory?
- Interaction: informal vs. formal, harmony vs. honesty, sincerity vs. scheming?
- Online training: Friend/guru? Tradition/skills?

Additional Issues: 2/4

- **Conflict:** Frequent vs. seldom? "Flaming" OK?
- **Content:** challenging vs. feel-good?
- **Rewards:** Money vs. group acclaim?
- **Avatars:** Culturally OK?
- **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]

Additional Issues: 3/4

- Personal *vs.* group opinions? China: "Personality"?
- Shame *vs.* guilt: Personal Webcams, SMS OK?
- Individual *vs.* collective cultures: role of community, chatroom behavior, hiring sites, coop work sites?
- Management/training? Most for individual,not collective cultures, *e.g.*, honesty and confrontation

[Bangalore Times, 30 Mar 04, p1]

Additional Issues: 4/4

- Work sites: Task vs. personal relation?
- Different men, women sites? Service orientation?
- Role of advertising, hyperbole? Different in masculine vs. feminine cultures?
- Masculine vs feminine differences for job sites: Careers? Interest in subject? Skills vs contacts?
- Culture difference: Activities outside the home?
- Western vs. Eastern: Truth vs. virtue/practical?

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

- CHI 2009: Three explicitly title sessions, plus many more papers, posters, abstracts
- UPA 2009: Increasing number of sessions
- HCII 2009: Eight sessions, 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: Since 1999, next in London, June 2010

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

- More articles and books in recent years
  - Livermore, David (2010). *Leading with Culture Intelligence*
  - Jackques, 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 of other countries/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

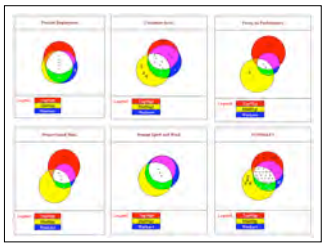
- Examples: Avoiding cultural gaffes
  - Business meeting mistakes: "Russian culture fosters smiling in private settings and seriousness in business settings."
  - One driving training company expanded into 20 countries before realizing product's culture flaws, then spent $1m to correct them
  - [Malby, 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/VennDiagramRepresentations.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

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

List Servers

- ACM/SIGCHI Intercultural listserve:
  chi-intercultural@acm.org
  Moderator: Donald Day,d.day@acm.org
  www.HCIBib.org//SIGCHI/Intercultural
- Non-sponsored intercultural research:
  Cross-L, University of Denver
  Owner: Roberto Evaristo
  For info: Donald Day, d.day@acm.org

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- Hofstede, Geert (1997). *Cultures and Organizations*, , New York: McGraw-Hill.
- Marcus, A (1999) "International and Intercultural. User Interfaces," in Stephanidis, ed., *User Interfaces for All*, Mahway, NJ: Lawrence Erlbaum Associates
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- Spradley, J.P., and McCurdy, D.W. (1972). *The Cultural Experience: Ethnography in Complex Society*. Prospect Heights, IL: Waveland Press.

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- Marcus, Aaron: "Global/Intercultural User-Interface Design." The Human-Computer Interaction Handbook. Mahwah: Lawrence Erlbaum & Associates 2002. ISBN 0805844686.
- Nielsen, ed., *Designing User Interfaces for International Use*, 1990.
- Harel and Prabhu, "Global User Experience (GLUE), Design for Cultural Diversity: Japan, China,...India," *Proc.* IWIPS-99, Rochester, ISBN 0-9656691, pp. 205-216.
- Stephanidis, ed., *User Interfaces for All*, Lawrence Erlbaum Associates, 2000.
- Trompenaars, *Riding the Waves of Culture*, 1998.
- Williams, Raymond (1983). *A Vocabulary of Culture and Society*. New York: Oxford University Press.

Other Info Sources

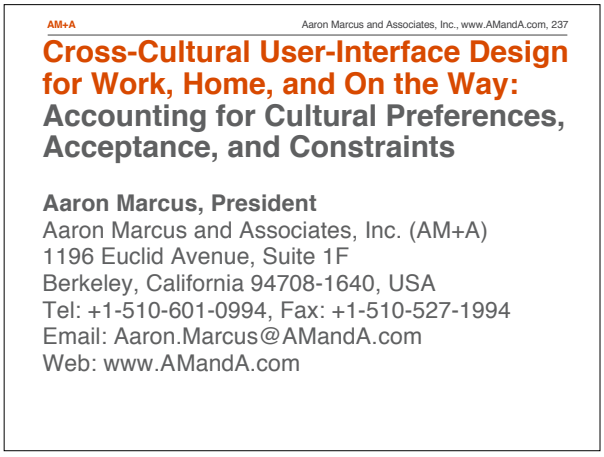
- Proceedings: IWIPS (www.iwips2003.org), CHI (www.acm.org), HCII(www.hcii03.gr)
- Corporate Websites: IBM, Microsoft, Sapient
- LISA Localization Industry Primer: www.LISA.org
- ISO standards documents
- AM+A Bibliography and URL list

6. Conclusion

- Web UI+IV design is immediately global
- Develop specifications per target markets
- Resources of information exist
- Design, evaluate, document variations
- Future development of tools, templates

A Challenge: Bone vs. Bottle

Concept by Donald Day
IWIPS 1999
Email: d.day@acm.org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Cross-Cultural User-Interface Design for Work, Home, and On the Way:
Accounting for Cultural Preferences, Acceptance, and Constraints
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User-Interface Design vs. Culture in Corporate Web Design

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Based on IWIPS 2004 presentation and case study published in *Visible Language* 2004

Presentation Summary

- 1. Introduction
- 2. Method
- 3. Analysis of culture dimensions and UI components
- 4. Visual syntax patterns
- 5. Conclusion

1. Introduction

- User-interface (UI) design for Websites develops cultural artifacts
- Goal of this research: Analyze Websites to understand to what extent corporate designs seem to exhibit differences that relate to cultural differences, even if *complying with corporate standards*!
- Supports AM+A's published Web UI analyses that apply Hofstede's culture dimensions to the field of UI design

User-Interface Components, 1/2

- **Metaphors:** Easy recognition and retention of fundamental concepts via terms, images, sounds, etc.
- **Mental Models:** Appropriate organization and representation of data, functions, tasks, roles, and people in organizations of work or play.
- **Navigation:** Efficient movement within mental models via menus, dialogue boxes, and control panels, etc.

User-Interface Components, 2/2

- **Interaction:** Effective input/output sequencing, including feedback; overall behavior of human-computer and human-human systems.
- **Appearance:** How the product/service appears to the senses (visual, acoustic, tactile, etc), especially related to visual identity and/or branding objectives.

Hofstede's 5 Dimensions of Culture, 1/2

- **Power-distance** (PD)
  - Focuses on the degree of equality, or inequality, among people in the country's society
- **Collectivism vs. individualism** (IDV)
  - Focuses on the degree the society reinforces individual or collective, achievement and interpersonal relationships
- **Femininity vs. masculinity** (MAS)
  - Focuses on the degree 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)

Hofstede's 5 Dimensions of Culture, 2/2

- **Uncertainty avoidance** (UA)
  - Extent to which the members of a culture feel threatened by uncertain or unknown situations
- **Long- vs. short-term orientation** (LTO)
  - Focuses on the degree the society embraces, or does not embrace, long-term devotion to traditional, forward thinking values (strongly related to Confucian societies).

2. Method

- Combining the scheme of Hofstede's cultural dimensions and the scheme of design components in a five-by-five matrix

	PD	IDV	MAS	UA	LTO
Metaphor					
Mental Model					
Navigation					
Interaction					
Appearance					

Cross-Cultural Matrix

		Hofstede Culture Dimension: Power Distance (PD)	
		Low PD	**High PD**
User-Interface Component: Appearance	**Appearance**	Images of people, groups; daily activities; popular music, symbols, typefaces, layouts, colors; informal speech	Images of leaders; national/corporate/government themes, slogans, insignia, logos, symbols, typefaces, layouts, colors; official music, anthems; formal speech

Websites Analyzed

- Objective was to be as inclusive as possible
- "Mature" company Websites with parallel content in multiple countries
- Consumer 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)

Key Findings

- Website examples studied
- Note: Not all cells are filled

	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			SIE McD MER		HIT
Appearance	COC SIE PEO		McD COC MER	SIE McD	SIE

3. Analysis of Culture Dimensions and UI Components

- Examples discuss Hofstede's culture dimensions and within them user-interface components

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 13

Power Distance: Metaphors

- **Low:** Informal, or popular institutions, buildings, and objects, that emphasize equality, options

  Examples: Summerhill, play/games, public spaces, *etc.*
- **High:** Government or corporate institutions and buildings; objects with clear hierarchies

  Examples: the human body, schools, government, monuments, *etc.*

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 14

Power Distance: 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

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

Power Distance: Mental Model

- **Low:** Simple, informally organized and categorized structures; less structured data with some or much relevancy
- **High:** Complex, highly organized, highly categorized, highly populated structures, e.g., large corporate and/or government organizational models or charts; reference data with little or no relevancy ranking

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 16

Power Distance: Mental Model

- **Hitachi Website:** Amount of categorization
- Canada (PD 39) Singapore (PD 47)

Simple, informally organized and categorized structures

Highly categorized

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 17

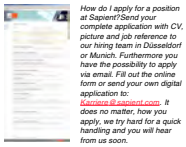
Power Distance: Navigation

- **Low:** Open access, multiple options, sharable paths
- **High:** Restricted access, choices; authentication; passwords; prescribed routes

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 18

Power Distance: 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

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 19

Power Distance: Interaction

- **Low:** Supportive error messages, cue cards; many user-driven options available
- **High:** Severe error messages: "Entry Forbidden," "You are wrong;" wizards or guides lead usage

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 20

Power Distance: Interaction

- **Coca Cola Website:** Feedback language
- Denmark (PD 18) Malaysia (PD 104)

Supportive error messages

Severe error messages

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 21

Power Distance: Interaction

- Denmark (PD 18)

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 22

Power Distance: Interaction

- Malaysia (PD 104)

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 23

Power Distance: Appearance

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

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 24

Power Distance: Appearance

- **Siemens Website:** People vs. leaders
- Italy (PD 50) Singapore (PD 74)

Images of people

Images of leaders, official buildings

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 25

Collectivism vs. Individualism: Metaphors

- **Low:** Relationship-oriented, content-oriented
- **High:** Action-oriented, tool-oriented

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 26

Collectivism vs. Individualism: Metaphors

- **McDonalds Website:** Focusing on groups vs. focusing on individuals
- Brazil (IDV 38) United States (IDV 91)

Images of groups in organizations that visualize the section "McDonalds in Brazil"

Images of a single person to visualize the "Corporate" section of McDonalds USA.

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 27

Collectivism vs. Individualism: Metaphors

- Brazil (IDV 38)

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 28

Collectivism vs. Individualism: Metaphors

- United States (IDV 91)

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 29

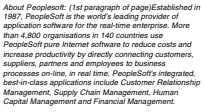
Collectivism vs. Individualism: Mental Model

- **Low:** Role-oriented
- **High:** Product- or task-oriented

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 30

Collectivism vs. Individualism: Mental Model

- **PeopleSoft Website:** Personal achievement
- Singapore (IDV 20) Germany (IDV 67)



About Peoplesoft: (1st paragraph of page)Established in 1987, PeopleSoft is the world's leading provider of application software for the real-time enterprise. More than 4,800 organisations in 140 countries use PeopleSoft pure Internet software to reduce costs and increase productivity by directly connecting customers, suppliers, partners and employees to business processes on-line, in real time. PeopleSoft's integrated, best-in-class applications include Customer Relationship Management, Supply Chain Management, Human Capital Management and Financial Management.

Personal achievement is underplayed

PeopleSoft GmbH was founded in 1995. The headquarter is located in Munich. CEO is Stefan Hüchbauer.

Direction

(Translated)

Personal achievement is maximized

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 34

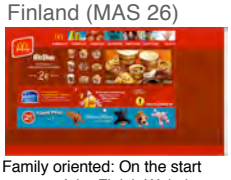
Femininity vs. Masculinity: Metaphors

- **Low:** Shopping carts; family-oriented, people-oriented
- **High:** Sports-oriented; competition-oriented; work-oriented

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 35

Femininity vs. Masculinity: Metaphors

- **McDonalds Website:** Family vs. competition
- Finland (MAS 26)
- Austria (MAS 79)



Family oriented: On the start screen of the Finish Website one can find more emphasis on products, shopping and family related imagery.

Competition oriented: The Austria McDonalds Website offers right at the start screen a competitive game.

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 36

Femininity vs. Masculinity: Mental Models

- **Low:** Social structures; detailed views; relationship-oriented
- **High:** Work/business structures; high-level, "executive views;" goal-oriented

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 37

Femininity vs. Masculinity: Mental Model

- **Siemens Website:** Social orientation vs. personal goals
- Norway (MAS 8)
- Austria (MAS 79)

Social structures: relationship oriented

Work / business structures: goal oriented

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 38

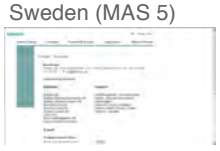
Femininity vs. Masculinity: Navigation

- **Low:** Multiple choices; multi-tasking, synchronic
- **High:** Limited choices, sequential

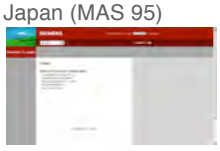
AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 39

Femininity vs. Masculinity: Navigation

- **Siemens Website:** Amount of choices offered
- Sweden (MAS 5)
- Japan (MAS 95)



Multiple choices: Many possibilities



Limited choices: only one possibility, to write an email.

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 40

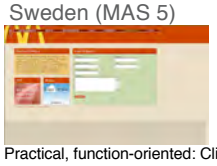
Femininity vs. Masculinity: Interaction

- **Low:** Practical, function-oriented; co-operation-oriented; team oriented
- **High:** Competitive-game-oriented; mastery-oriented; individual-oriented

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 41

Femininity vs. Masculinity: Interaction

- **McDonalds Website:** Practice-oriented vs. game-oriented
- Sweden (MAS 5)



Practical, function-oriented: Client service section much more prominent then gaming section, direct contact possible.

Austria (MAS 79)

Game-oriented, technical content: Fun section that offers wall paper, extras and screen savers. No client service section.

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 42

Femininity vs. Masculinity: Appearance

- **Low:** "Feminine" colors, shapes, sounds; acceptance of cuteness
- **High:** "Masculine" colors, shapes, sounds

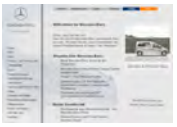
AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 43

Femininity vs. Masculinity: Appearance

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

Softer edges and shapes

Germany (MAS 66)



Clear structure, no cuteness

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 44

Uncertainty Avoidance: Metaphors

- **Low :** Novel, unusual references; abstraction
- **High:** "Familiar, stable, clear references to daily life; representation

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 45

Uncertainty Avoidance: Metaphors

- **Sapient Website:** Abstraction vs. clear reference to daily life
- United Kingdom (UA 35)

Tagline: MAKING TECHNOLOGY MATTER

Abstraction

Japan (UA 92)

Tagline: DESIGNING TECHNOLOGY HUMANS CAN USE

Clear reference to daily life

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 46

Uncertainty Avoidance: Metaphors

- **Siemens Website:** Abstraction vs. representation
- United Kingdom (UA 35) Belgium (UA 94)

Novel, unusual references, abstractions

Familiar, clear references to daily life, representations

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 47

Uncertainty Avoidance: Mental Models

- **Low :** Tolerance for ambiguousness, implicit structures or relations, complexity; fuzzy logic
- **High:** Simple, explicit, clear articulation; limited choices; binary logic

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 48

Uncertainty Avoidance: Navigation

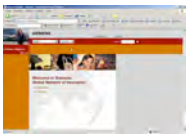
- **Low :** Tolerance for ambiguous, possibly redundant options; tolerance for risk, gambling; tolerance for simple controls, e.g., simple searches on the Web, or www.Google.com's "I Feel Lucky" button.
- **High:** Desire for limited, clear organized options; tolerance for complex, fine tuning controls to "master" or "control" a situation, *e.g.*, advanced searches on the Web, consumer electronics controls.

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 49

Uncertainty Avoidance: Mental Models and Navigation

- **Siemens Website:** Fuzzy logic vs. binary thinking
- Switzerland (UA 58) Belgium (UA 94)

Fuzzy logic: User can chose languages but also dive directly into the Website.



Binary logic: User must choose language before entering content.

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 50

Uncertainty Avoidance: Interaction

- **Low :** General, limited, or ambiguous input and feedback of status; devices that may have gross tuning.
- **High:** Precise, complete, detailed input and feedback of status; devices that permit fine-tuning.

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 51

Uncertainty Avoidance: Appearance

- **Low :** More varied, ambiguous, less-consistent imagery, terminology, sounds; tolerance for more perceptual characteristics involved in purely ornamental or aesthetic use; less redundant coding of perceptual cues.
- **High:** Simple, clear, consistent imagery, terminology, sounds; highly redundant coding of perceptual cues.

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 52

Uncertainty Avoidance: Appearance

- **Siemens Website:** Variety vs. consistency
- United Kingdom (UA 35) Belgium (UA 94)

Ambiguous, varied imagery

Simple, clear, consistent imagery

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 54

Long- vs. Short-term Orientation: Mental Models

- **Low :** Liberty: social incoherence, social irresponsibility, efficiency
- **High:** Love/devotion; social coherence, responsibility, support

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 55

Long- vs. Short-term Orientation: Mental Models

- **Siemens Website:** Variety vs. consistency
- Pakistan (LTO 0) China (LTO 118)

Siemens Pakistan Engineering Co. Ltd., with headquarters in Karachi and two regional branches in Lahore and Islamabad, is one of the largest international companies in Pakistan.

Siemens co-operation with China began in 1872.

Emphasis on size

Emphasis on history

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 57

Long- vs. Short-term Orientation: Interaction

- **Low :** Distance communication accepted as more efficient; anonymous messages tolerated; conflict tolerated, even encouraged; performance-critical communication
- **High:** Preference for face-to-face communication, harmony; personalized messages; more links to people; live chats; interaction as “asking”

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 58

Long- vs. Short-term Orientation: Interaction

- **Hitachi Website:** Use of communication methods
- US (LTO 29) Singapore (LTO 48)

No personal info, non-electronic information; just Web form mail contact

Personal info, non- electronic communication information on top

Distance communication accepted as more efficient

Preference for face-to-face communication

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 59

Long- vs. Short-term Orientation: Appearance

- **Low :** Minimal and focused images; short borders, lines, edges; concentration on showing task or product
- **High:** Cultural markers: flags, colors, national images; soft focus; warm, fuzzy images; pictures of groups inviting participation, suggestions of intimacy and close social distance

Long- vs. Short-term Orientation: Appearance

- **Siemens Website:** Task-oriented vs. group-oriented
- Pakistan (LTO 0)

Concentration on showing tasks or products

China (LTO 118)

Warm, fuzzy images, pictures of groups

4. Visual Syntax Patterns

- Broader research on patterns of visual syntax
- Images found on home pages of Websites of Siemens and PeopleSoft
- Comparison

Power Distance

- Patterns found
  - All countries not putting a picture on the front page have low PD value.
  - The eight countries with the highest PD value show a picture of a male person.

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.

5. Conclusion

- Matrix-oriented method helps to organize and analyze data collection
- Research method seems useful and productive
- Cultural habits run deeply and operate even under constraints of corporate global Web design specifications
- Designer must account for context *and* culture
- Patterns may influence cultures and design conventions: continuous process of change

Culturebase

- One likely result of such research: "Culturebase" with specific conditions and predictable results that would inform a content management system (CMS)
- More data is needed
- Further research could produce quantitative and qualitative results that may feed culture-localization templates and tools

Selected References, 1/4

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- Marcus,Aaron, and Baumgartner, Valentina-Johanna (2004). "A Practical Set of Culture Dimension for Evaluating User-Interface Designs" in *Proceedings*, Sixth Asia-Pacific Conference on Computer-Human Interaction (APCHI 2004), Royal Lakeside Novotel Hotel, Rotorua, New Zealand, 30 June-2 July 2004, 252-261.

Selected References, 2/4

- Hofstede, Geert (1997). *Cultures and Organizations: Software of the Mind, Intercultural Cooperation and its Importance for Survival*, McGraw-Hill, New York, ISBN 0-07-029307-4.
- Kress, Gunther R., and Van Leeuwen, Theo (1996). *Reading Images: The Grammar of Visual Design*. New York: Rutledge (ISBN 0415106001)

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- Marcus, Aaron (2004). "User-Interface Design and Culture." Chapter in Aykin, Nuray, ed., *Usability and Internationalization in Information Technology,* New York: Lawrence Erlbaum Publishers.
- Marcus, Aaron (2002). "Culture Class vs. Culture Clash." Fast-Forward Column, *Interactions*, ACM Publisher, www.acm.org, 9:3, May/June 2002,31-36.

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- Marcus, Aaron (2007). "Global/Intercultural User-Interface Design." Chap. in, *The Human-Computer Interaction Handbook*. Mahwah: Lawrence Erlbaum Associates. ISBN 0805844686.
- Marcus, Aaron. (1999). "Globalization of User-Interface Design for the Web," in *Proceedings*, 1st Intern. Conference on Internationalization of Products and Systems (IWIPS), Girish Prabhu and Elisa M. Delgaldo, eds., 22-22 May1999, Rochester, NY, Backhouse Press, Rochester, NY, USA, ISBN: 0-965691-2-2, pp. 165-172.

User-Interface Design vs. Culture in Corporate Web Design

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A Practical Culture Dimensions Set for Global UI Development

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Introduction, 1/3

- Different countries/cultures use UIs differently
- Differences: Metaphors, mental models, navigation, interaction, and appearance
- Graphics, layouts, behavior patterns change to provide optimum user experience.
- Current content management systems (CMS) not able to handle most culture aspects of content
- International usability engineering is challenging and often avoided

Introduction, 2/3

- To support development of culture-sensitive CMS, desirable to identify most important dimensions of culture for UI development
- This study of optimum culture dimensions based on Marcus study of Hofstede's cultural dimensions and applying them to the field of UI design [Marcus and Gould]
- This research goes further: seeks to find optimum dimensions for culture-oriented evaluation of UIs

Introduction, 3/3

- Baumgartner surveyed experts to obtain their opinions of best dimensions
- Experts asked to rank dimensions according to their perceptions of importance
- Baumgartner analyzed which dimensions most important for the field of UI design and why they are important.
- Much was controversial; but results are valuable
- Goal: Derive a concrete result that provides a basis for further discussion

Culture Definitions, 1/2

- "the set of shared attitudes, values, goals, and practices …" [Webster, online]
- "…Culture can also be affected by nationality, language, history, and level of technical development." [del Galdo]
- *"Dimensions of culture* are…categories that organize cultural data." [Hoft]
- Idea cultural dimensions originated in cross-cultural communication research … by Hall… Kluckhohn and Strodtbeck in the 1950s." [Gould]

Culture Definitions, 2/2

- Geert Hofstede's highly cited study in 1970s and 80s determined five culture dimensions
  - Survey at IBM that "dealt mainly with the employees' personal *values* related to work situation…"
  - Covered 72 national subsidiaries, 38 occupations, 20 languages, and about 116,000 people. [Hofstede]
- Other anthropologists and communication scientists determined different cultural dimensions

Basis of Survey by Baumgartner

- Marcus combined scheme of Hofstede's five cultural dimensions and scheme of five UI design components to create a five-by-five matrix that allows for 25 fields of interest
- Previous studies sought to determine which dimensions might be most useful in mapping culture dimensions to UI components
- Survey used authors selected by informal polling of limited number of initial experts regarding primary resources

11 Authors in 9 Sources used for Survey

- 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.

Two Categories of Culture Dimensions: Objective, Subjective

- Objective: "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."
  - Easy to extract from a culture
  - Localizaton techniques already consider/use most objectives
  - Economic progress, country resources nevertheless included in survey because not used in localization and measured diffferences in expert's ratings
- Subjective: information "…like value systems, behavioral systems, and intellectual systems…" [Hoft]
  - Survey focuses on subjective primarily

29 Dimensions by 9 Sources Used in Survey

- 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

Most of 57 Experts Surveyed

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

Survey Results, 1/2

- Survey definitions, rating scheme, and comments area pre-tested with Austrian UI design students
- 57 experts from 21 countries completed survey
  - Australia, Austria, Belgium, Canada, China, Cyprus, Egypt, France, Germany, Hungary, India, Japan, Mexico, Netherlands, Pakistan, Scotland, South Africa, Switzerland, Sweden, UK, and USA
  - 19 experts work in a non-native country
  - c. 43% originally from N. America, 39% form Europe.
  - 47% currently work in N. America and 37% in Europe
  - 27 had 3-7 y, 14 had 7-11 y of UI design experience
- More than 40 institutions
  - Global firms (*e.g.*, Siemens, Peoplesoft, and Ogilvy) and smaller
  - Universities (*e.g.,* Kanda University of International Studies, Stanford University, The George Washington University).

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Survey Results, 2/2

- Experts' comments positive
  - Many mentioned: set of 29 dimensions itself would be helpful tool
  - Nearly all mentioned: general opinion on topic very hard because "everything depends;" nevertheless, all provided rankings of dimensions
- Analyzing data purely statistically risky; survey is qualitative, not quantitative
  - Deviation and variance in raw date not very meaningful
  - Ordinal values, not metrical more useful
- Factor analysis presents results

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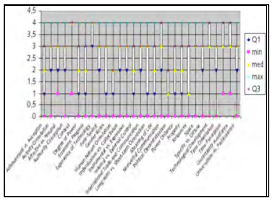
Boxplot (Whisker) Factor Analysis: Shows Distribution of Expert Ratings

- Boxplot Measures central location (median), two measures of dispersion (range and inter-quartile range), skewness (from orientation of median relative to quartiles) and potential outliers (marked individually)
- Anaysis of ordinal values uses parameters like first quartile (Q1), third quartile (Q3), minimum (min), median (med), maximum (max)



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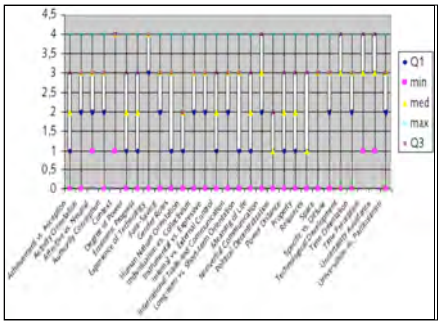
Boxplot (Whisker) Factor Analysis



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Coming Up with Winners

- Filtering out most important dimensions all after rank of Authority conception dimension somewhat subjective
- Statistical rationale
  - 5 Dimensions clearly located in space between "very important" (4) and "important" (3): Context, Environment and technology, Technological development, Time perception, and Uncertainty avoidance
  - Because Authority conception is, on average, still very high and in statistical ranking of experts with more than five years of experience even at rank 5, it seemed reasonable to include this dimension in the top five dimensions

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Ranking of Most Important Dimensions + List After Merging

Context	Context
Environment, technology	Technological development
Uncertainty avoidance	Uncertainty avoidance
Technological devlpmnt	Time perception
Time perception	Authority conception
Authority conception	

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Detailed Explanation of Rationale, 1/3

- *Context*, described as "the amount and specificity of information in a given situation,"
  - Heads ranking with average rating of 3.73 among all participants and average of 3.79 among participants with more than 5 years of UID (among latter group noone rated dimension lower than 3 out of 4)
- *Experience of technology (second)* combined with *Technological development (fourth)*, and renamed Technological development (having to do with development and attitude of members of a certain society towards technological development).
  - Both dimensions rated as very important (3.30 and 3.18) for UID

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Detailed Explanation of Rationale, 2/3

- *Uncertainty avoidance* (third), with average rating of 3.21/4, and no one rated dimension as unimportant, was assumed to be important for nearly every UI to take into account for behavior of user in uncertain or unknown situations
- *Time perception* (among top 6), with an average ranking of 3.14, was considered unimportant by no one. *Authority conception* had an average of rating of 2.86.

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Detailed Explanation of Rationale, 3/3

- *Power distance (*similar to *Authority conception)* ranked 22nd
  - Possible explanation of this contradiction could be wording: Authority conception denotes with its name what this dimension is about unlike Power distance. It was assumed how people think of authority heavily influences their behavior in handling a UI

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Practical Use of "Best-of-Breed" Culture Dimensions

- Project objective: present ideas for how survey findings might be used for practical work
- Difficult to determine most important dimensions for UI design in general
  - More research must be done to filter out which dimensions are most important for special fields of UI design
- Example: the design of medical instruments might demand different cultural emphases than a general telecommunication tool
- Paper/thesis provide a grouped and ranked list of dimensions

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Ranked List of 29 Dimensions, 1/2

- 01 D05 Context
- 02 D25 Technological development
  D08 Experience of technology
- 03 D28 Uncertainty avoidance
- 04 D27 Time perception
- 05 D27 Authority conceptio
  D20 Power distance
- 06 D03 Affective vs. neutral
- 07 D09 Face-saving
  D24 Specific vs. diffuse
  D13 Instrumental vs. expressive
- 08 D02 Activity orientation
  D17 Meaning of life
- 09 D18 Nonverbal communication
  D23 Space

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Ranked List of 29 Dimensions, 2/2

- 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

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Details of Ranking, 1/2

- List gives overview of how dimensions are related to each other and how they could be grouped together
- Listed in order of statistical average (gained through survey) and grouped (for reasons to be described later), they form a practical list/tool to decide which dimension must be focused on in next step to cover most important differences

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Details of Ranking, 2/2

- Example: For localization, one should focus on top five dimensions
  - If more time available, project manager can decide which dimension should be focused on next using list as decision support tool
  - Grouping dimensions is very difficult and requires more empirical studies about how culture influences UI design. Currently, most theories based on assumptions; more studies and test required.
- Survey provides groupings based on idea that challenges UI designer faces when focusing on one dimension might relate to similar issues for related dimensions

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Groups Based on Survey, 1/4

- 1: D08 Experience of technology, D25 Technological development:
  - These are clearly similar in relation to technology
- 2: D27 Authority conception, D20 Power distance:
  - Hoft describes these two dimensions as very similar. Although the two dimensions have not been ranked by experts on similar levels, one can assume that cultural differences in this field have same impact on UI design because they are so similar

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Groups Based on Survey, 2/4

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

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Groups Based on Survey, 3/4

- 4: D02 Activity orientation, D17 Meaning of life:
  - Regarding metaphor building one can assume that societies that focus on material goals value doing more than being, the opposite might be true for spiritual oriented cultures. This assumption must be verified through research and testing
- 5: D18 Nonverbal communication, D23 Space:
  - Dimension of space is mentioned within dimension of nonverbal communication, called proxemics.

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Groups Based on Survey, 4/4

- D26 Time orientation, D16 Long-term vs. Short-term orientation:
  - These two dimensions are complementary: The first mainly affects metaphors and navigation, the latter mental models and interaction.
  - Within statistical ranking of average value, the two dimensions are followed by each other
  - 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 UI if they know that it will be necessary to know how to use it in future. Same can be true for long-term oriented societies

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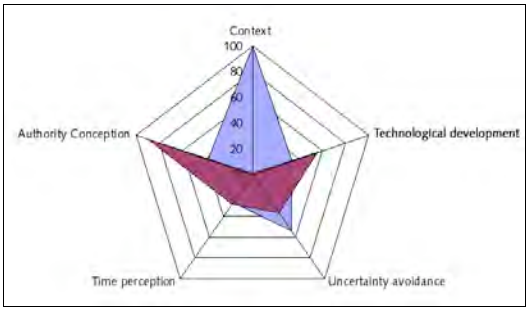
Example of Using Groups

- With researched values for all cultural dimensions for particular country, easy to generate tool to answer : “Is it necessary to change the UI for a certain culture/country?” and “Regarding which dimensions must changes be considered?”
- Tool basis: use pentagonal star charts, but expandable to more dimensions if needed for complexity of localization project
- Chart can show what changes are necessary and in what dimension, as Smith has demonstrated for different dimensions

Theoretical Comparison with Culture-Dimensions Pentagonal Star Chart



Conclusions and Recommendations, 1/2

- Generating a set of most important 7±2 cultural dimensions for localizing UIs is difficult task
- Expert believe everything depends on knowing the domain and purpose of the UI
- Survey ranked culture dimensions for UI design components and filtered out 5 primary dimensions:
  - Context, Technological development, Uncertainty avoidance, Time perception, and Authority conception
- Cross-Model Culture Dimension List
  - Baumgartner thesis describes 29 culture dimensions with concrete examples of their influence on certain UI domains and especially affected design components

Conclusions and Recommendations, 2/2

- Practical groups and ranked list of cultural dimensions can inform a decision making tool kit for localization
- Diagram tool can facilitate determining culture-related changes necessary for localizing to a specific target country
- Culturebase could automatically or semi-automatically handle cultural changes for CMS based on these dimensions

Next Steps

- Determine top dimensions for special fields of UI design could contribute and verify the findings of this general survey
- Develop 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 to support culturebase
- Future: Much remains to be researched; survey is a start

References

- Detailed references appear with the paper
- More publications and URLs available upon request
- Baumgartner's thesis URL available upon request

A Practical Culture Dimensions Set for Global UI Development

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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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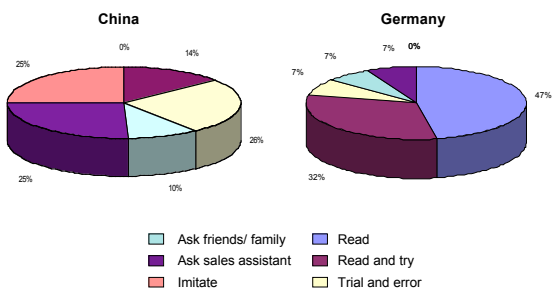
Empirical Results



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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. Animated instructions on CD-ROM are well accepted. 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. Stress pictorial information about procedures. Size of characters should correlated with importance of information.	Start with a clear overview of all possible functions Stress pictorial information which gives an overview 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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Email: pia.honold@siemens.com

[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

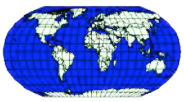
Context

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

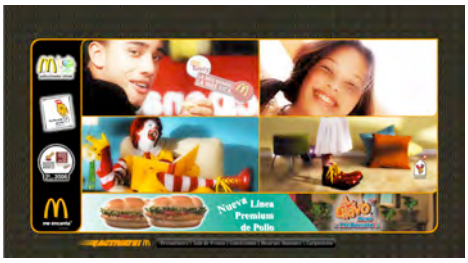
Client requirement of confidentiality prevents showing actual screens

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

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

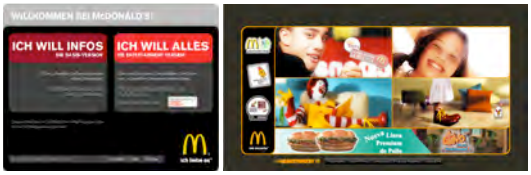
When Designing Websites, Keep User in Mind, 2/3

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)

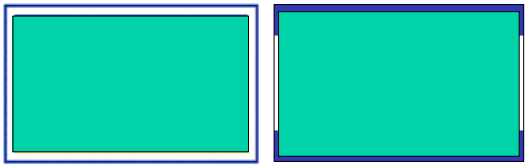
Preferences for Acceptable Amounts of White Space

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

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

Differences can be significant

Animation and Navigation of Website: Canada

Participants from Canada did not prefer Flash, simpler navigation acceptable

Animation and Navigation of Website: UK

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

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)

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

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]

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

Mobile Trends

Develop unhealthy attitudes. JP

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

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.

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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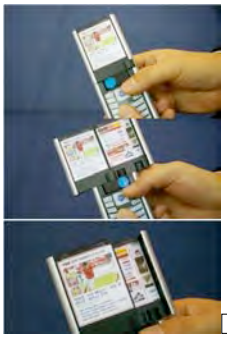
Mobile Trends



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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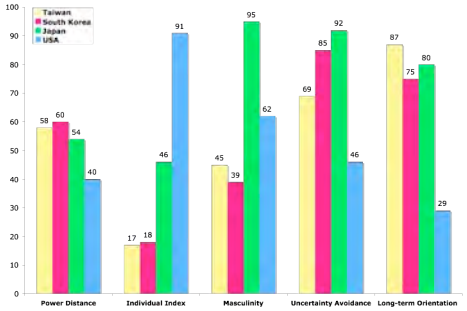
Hofstede's Dimensions of Culture Index Table



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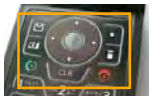
Bottom layout difference

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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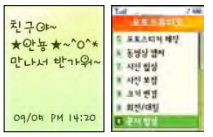
Photo Editing




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

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 18

Calendar Application


TW


KR

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

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 19

Emoticons

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

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

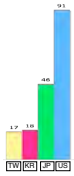
TW emoticons tend to use more Chinese characters

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

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

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 20

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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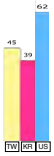
Femininity *vs.* Masculinity



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

AM+A Aaron Marcus and Associates, Inc., www.AMandA.com, 24

Mobile Trends and Culture Differences

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

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)	Blogsy, netvibes, iGoogle		Gmail	Google, Google

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	Everyone
	Geeks	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"

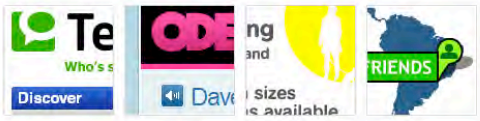
http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html

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

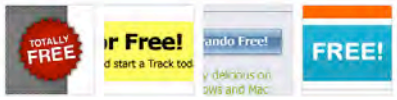
Source: Visual Design of Web 2.0, Pixel Acres,http://f6design.com/journal/2006/10/21/the-visual-design-of-web-20

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			✓

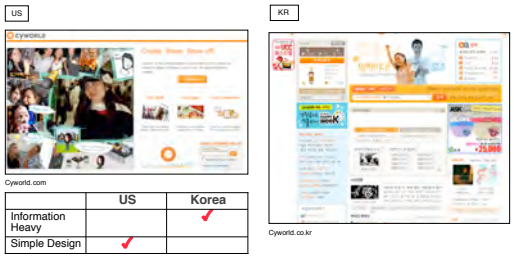
Web 2.0 Cultural Differences: Login for Social Networking Website, 2/2

	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	✓	

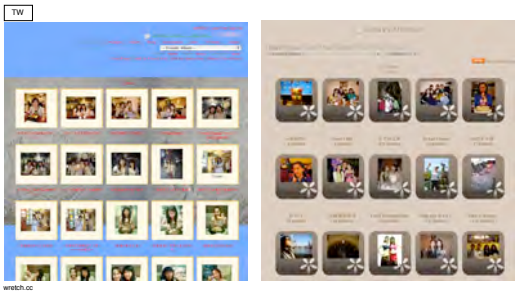
Web 2.0 Cultural Differences: Scrap-book Metaphor, Mental Model, 1/4

US

myspace.com

Web 2.0 Cultural Differences: Photo Album Metaphor, Mental Model

TW



wretch.cc

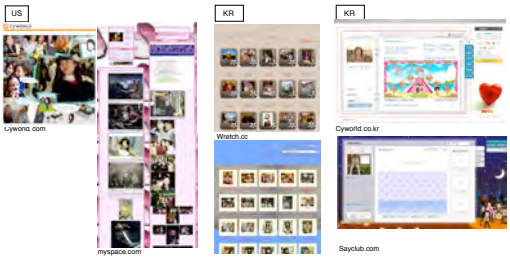
Web 2.0 Cultural Differences: Diary Metaphor, Mental Model

KR

cyworld.co.kr saycub.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

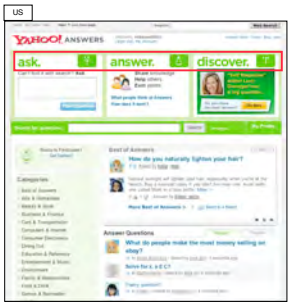
Top Navigation Model

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 – Academic of learning – Experienced knowledge and daily life advice sharing	
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	1. Ask - Post question 2. Answer - Open question 3. Discover - Resolved Question
Appearance	Color: Purple Special Image: Cartoon	Green 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

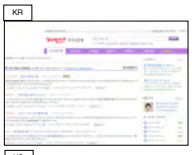
US

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 **Answers**: more experience-based knowledge	**Question**: Precise word of descriptions on question **Answers**: a. Personal opinion with logic based b. Provide direct personal information display c. Displays option of various communication methods to reach to d. Picture display 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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Cross-Cultural Analysis of Social Network Services (SNSs) in Japan, Korea, and the USA

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SNSs Around the World

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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

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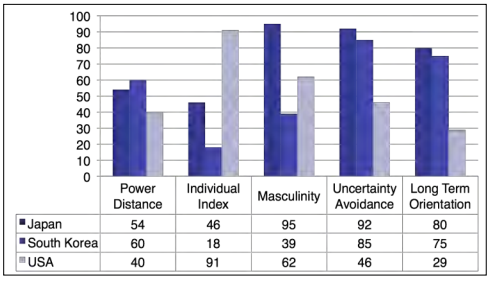
Background Work

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

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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					

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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

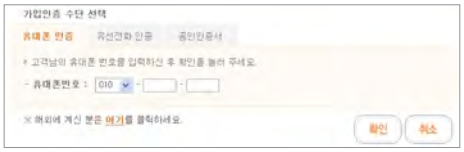
Method

- 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

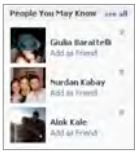
- MySpace (USA)
  - Less masculine (62)
  - Many choices in home page including music, videos and open applications
- Mixi (Japan)
  - More masculine (95)
  - Limited choices, no videos, closed applications

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

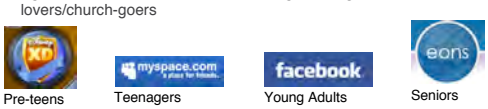
- Ning (USA)
  - Lower uncertainty avoidance (46)
  - Sign-in link to a new page
  - Inconspicuous placement at top right-hand corner of page
- LinkNow (South Korea)
  - Higher uncertainty avoidance (85)
  - Sign-in box prominently displayed on first page

Uncertainty Avoidance: Appearance, Symmetrical Design

- Ning (USA)
  - Lower uncertainty avoidance (46)
  - 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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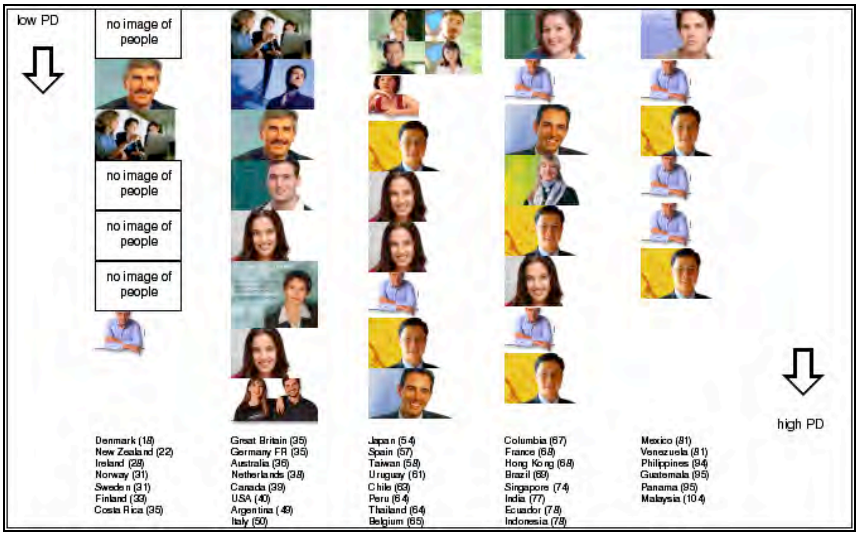
Culture *vs.* Corporate Global Web UI Design



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

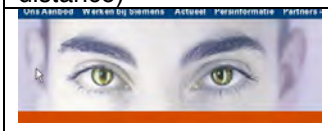
3.0 Analysis of culture dimensions and UI components

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

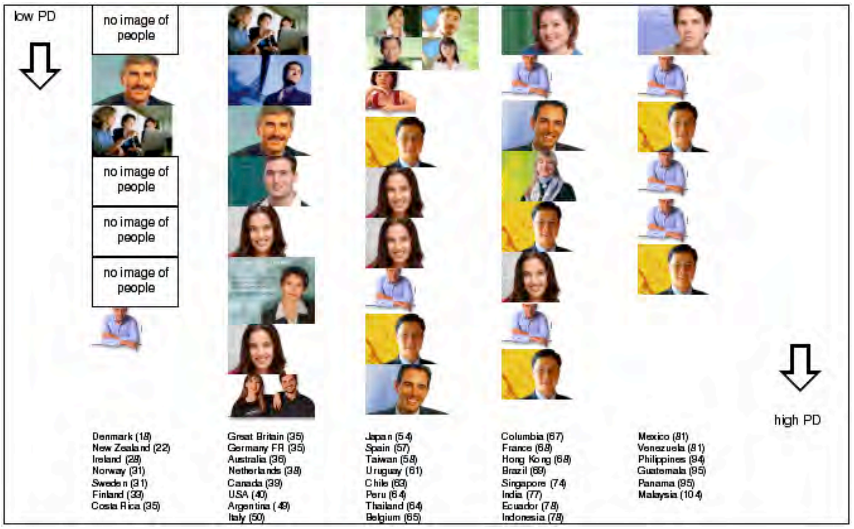
The previous analysis concentrated on specific cultural dimensions and, within each, the likely characteristics of UI components. It is also possible to examine broader patterns of visual syntax, for example, layout. We compared images found on home pages of Websites of Siemens and PeopleSoft, and we 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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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.

This document has appeared in a later revised, edited version in the following publication:

Marcus, Aaron and Gould, Emilie West (2000). “Crosscurrents: Cultural Dimensions and Global Web User Interface Design, Interactions, 7:4, July/August 2000, pp. 32-46.

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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?

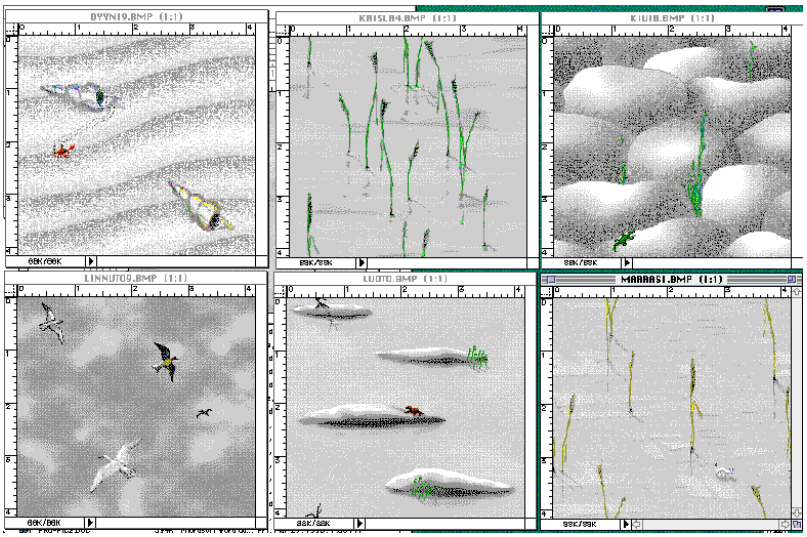

Figure 1. TeamWare Finnish screen patterns

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.

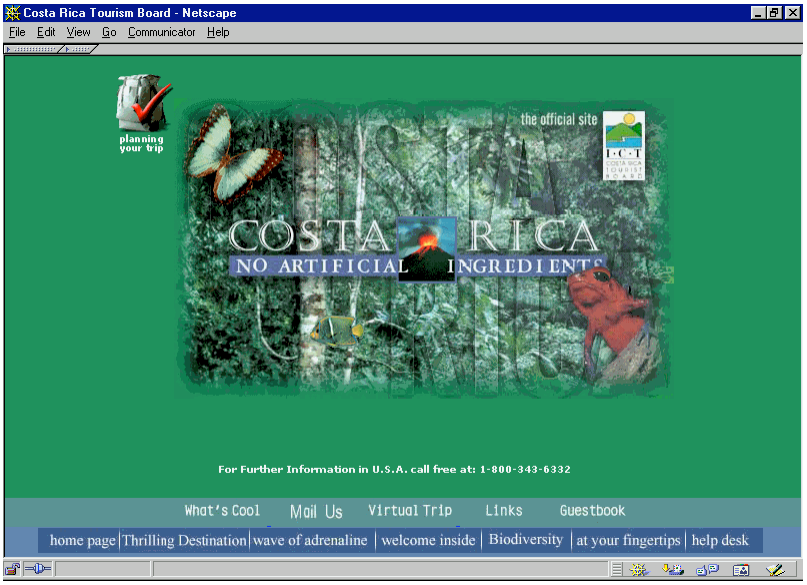

Figure 5. Low individualist value: Costa Rican National Park Website.

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.

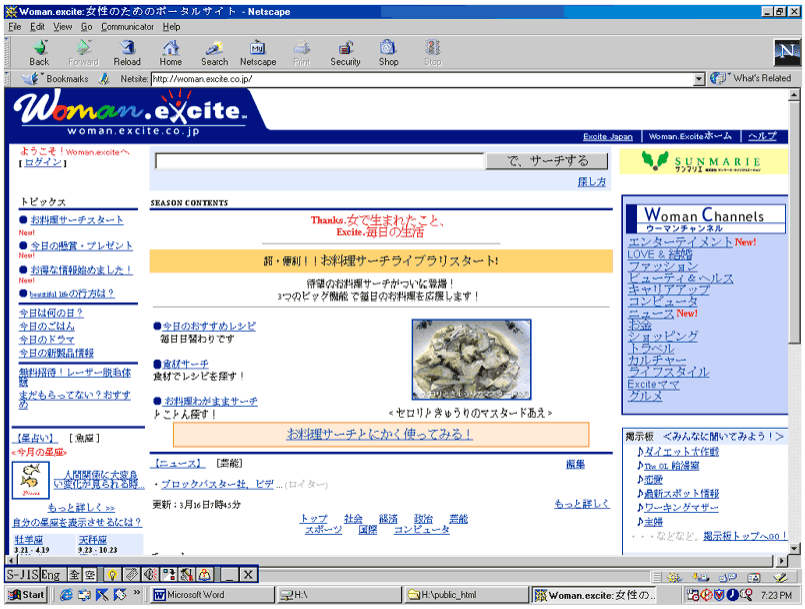

Figure 7. High masculinity Website: Excite.com for women in Japan

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.

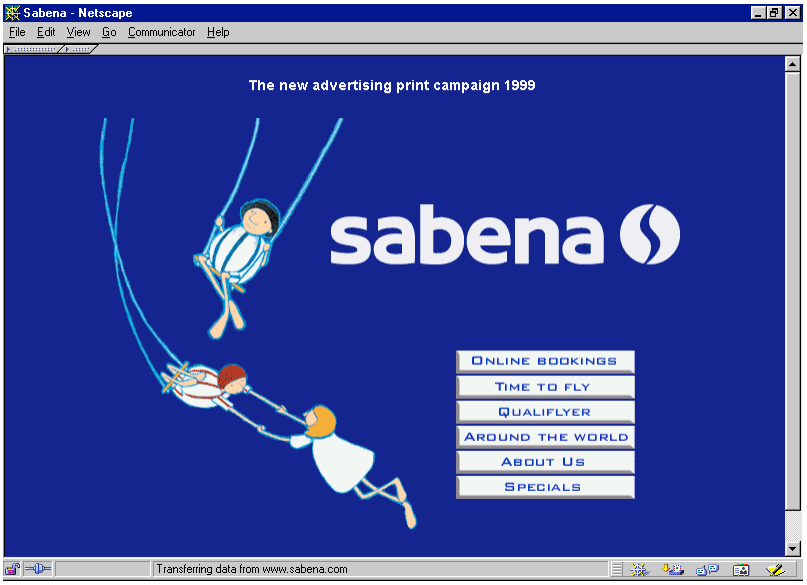

Figure 10. High uncertainty avoidance: Sabema Airlines Website from Belgium.

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.

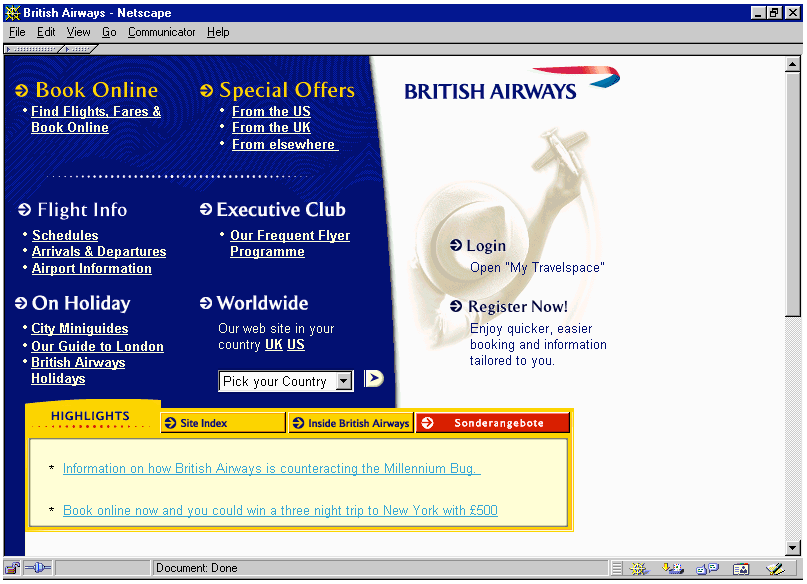

Figure 11. Low uncertainty avoidance: British Airways Website from United Kingdom.

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.

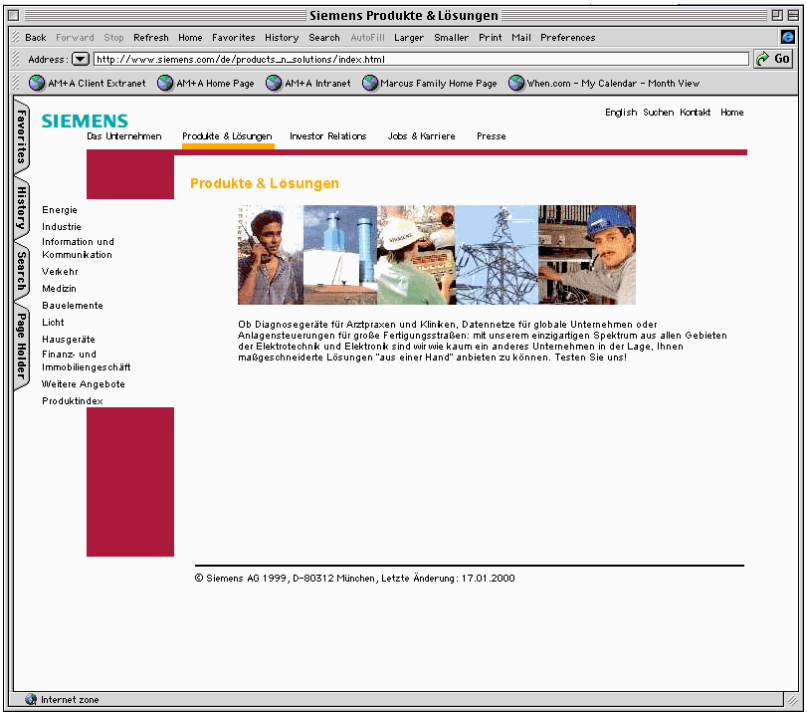

Figure 12. Low Long-term orientation: Website form Siemens Germany.

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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AM+A White Paper:

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

1 January 2004

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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.

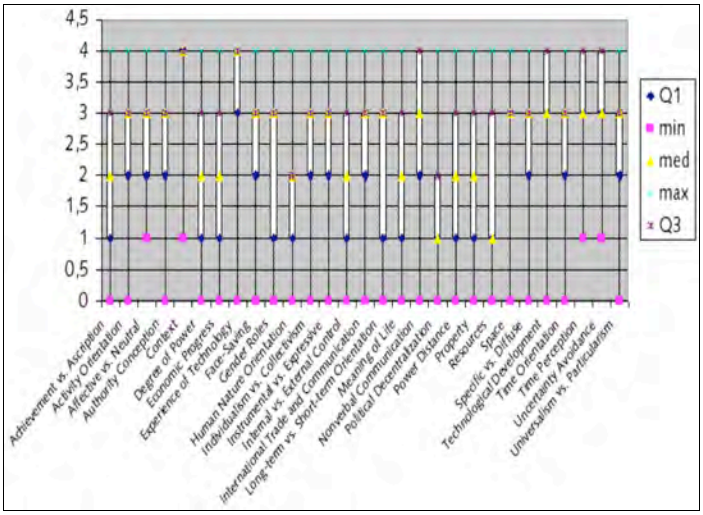


Figure 1. Boxplot or whisker diagram of the data gained through the questionnaire

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]:

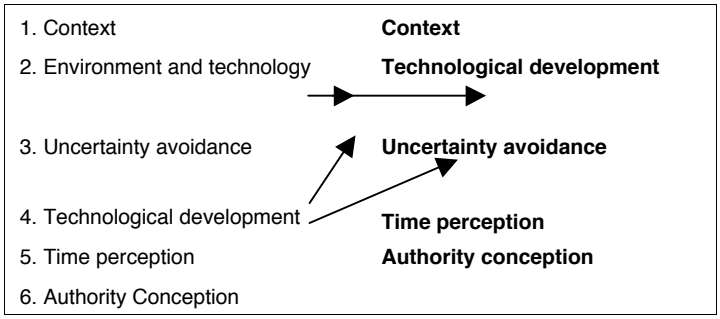


Table 1: Ranking of the most important cultural dimensions

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.

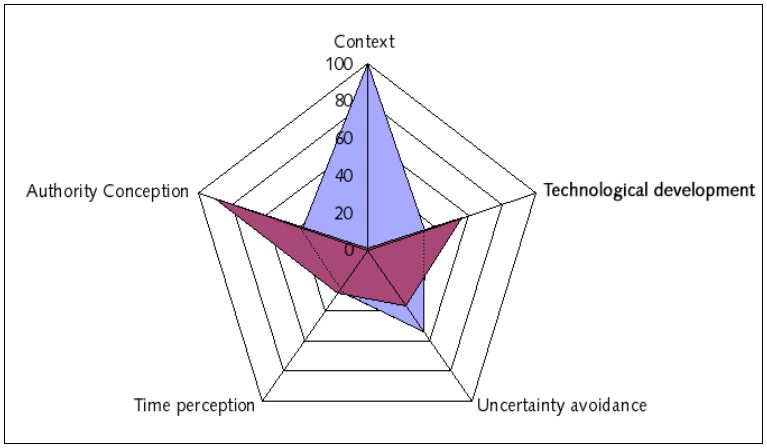
Group 4: D02 Activity orientation, D17 Meaning of life: Regarding metaphor building we can assume that societies that focus on material goals value doing more than being, the opposite might be true for spiritual oriented cultures. As already stated, this is just an assumption and has to be verified through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