



UNIVERSITY OF SCIENCE
HO CHI MINH CITY

User Interface Design

With some materials adapted from
Software Engineering, 8th Ed. by Ian
Sommerville and USC's CS588

Video

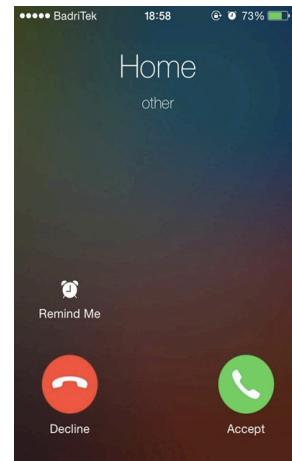
■ BMW i Vision Future Interaction



Important definitions

- User interface – UI
 - “**all components** of an interactive system that provide information and controls for the user to accomplish specific tasks with the interactive system” (ISO 9241-110:2006)
- Usability
 - “extent to which a system, product or service can be used by specified users to achieve specified goals with **effectiveness, efficiency** and **satisfaction** in a specified context of use” (ISO 9241-11:1998)
- User experience – UX
 - “person's **perceptions** and **responses** resulting from the use and/or anticipated use of a product, system or service” (ISO 9241-210:2010)

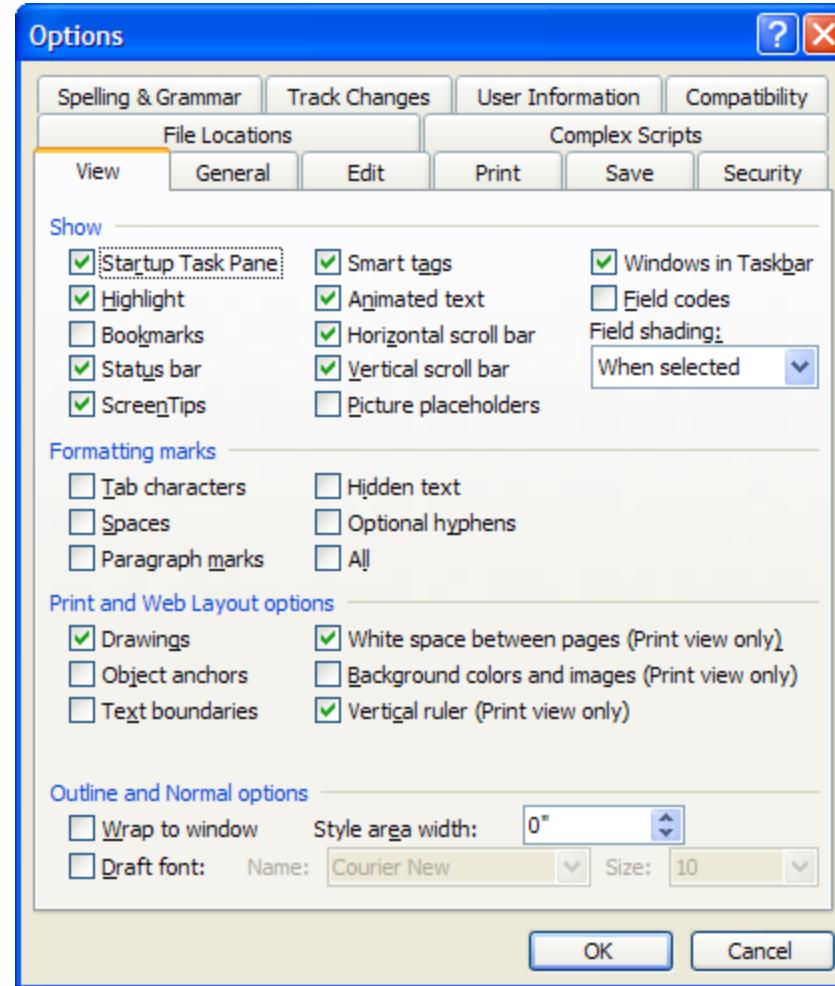
UI, Usability and User Experience



Group discussion

- Form groups of 5-6 students each, do the following
- 1. Review the UI in the next slide
 - Provide comments on the UI, both good and bad
- 2. From the comments from 1) provide criteria for evaluating the UI
 - What are characteristics of a good UI?
- 3. Report results

Options with tabs



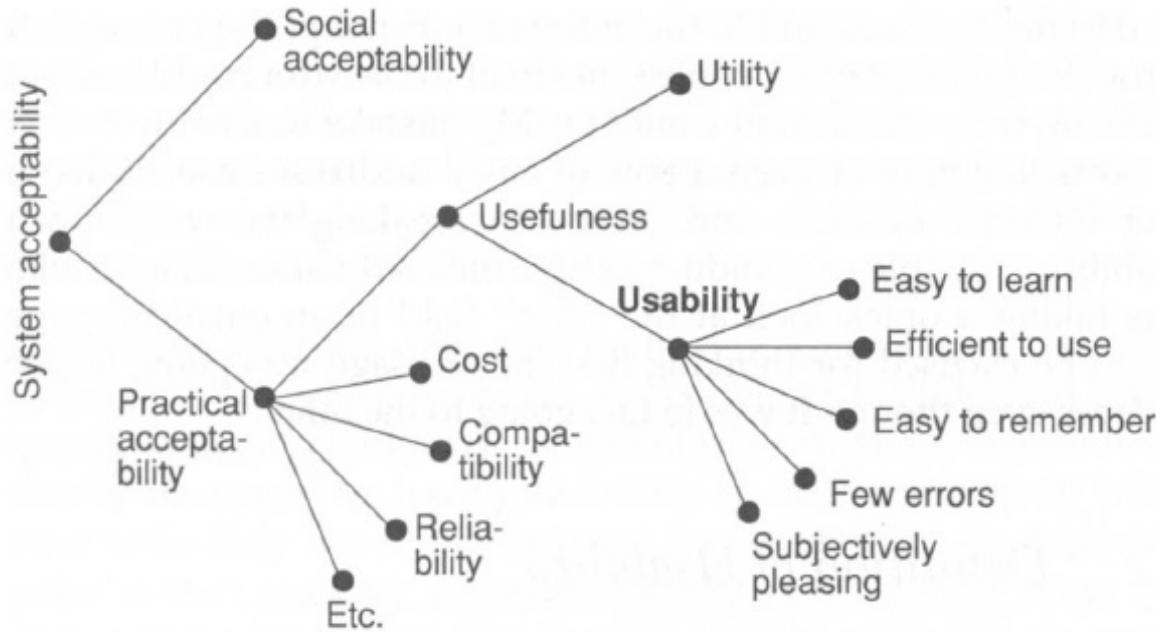
Outline

- What is Usability and Why it is Important?
- UI Design Principles
- UI Design Process
- Web Usability
- UI Hall of Fame or Shame

What is Usability

- Usability is a quality attribute that measures **how well users can use the system's functionality**
- Components
 - Learnability
 - How easy it is to learn and use
 - Efficiency
 - How quickly users perform tasks using the UI
 - Memorability
 - How easy it is for users to reestablish proficiency
 - Errors
 - Are the errors committed by users often? Is it easy to recover from errors?
 - Satisfaction
 - Are users satisfied with the UI?

Usability is only one attribute



(Jakob Nielsen, Usability Engineering, 1994)

Why Usability is Important?

- Usability is a condition for survival
- Users often judge a system by its interface rather than its functionality
- A poorly designed interface can cause a user to make catastrophic errors
- Many software systems are never used because of poor user interface design

Cost savings

- User's time isn't getting cheaper
 - It doesn't follow Moore's Law
- Saving user's time from using user interface and resolving errors
- Disasters happen

Problems with UI

- UI development is extremely labor intensive
- UI's require frequent and extensive modifications
 - due to not understanding all interactions until the system is complete
- Modifications to UI are time consuming if UI and processing are tightly coupled
- Programmers are not trained to design good UIs
- Programmers are not users
- Users are not designers

Human factors in interface design

■ Limited short-term memory

- ❑ People can instantaneously remember about 7 items of information
- ❑ If you present more than that, they tend to make mistakes

■ People make mistakes

- ❑ Everyone makes mistakes
- ❑ Inappropriate messages lead to more mistakes

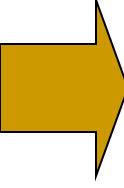
■ People are different

- ❑ People have a wide range of physical capabilities
- ❑ Designers should not just design for their own capabilities

■ People have different interaction preferences

- ❑ Some like pictures, some like text

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UI design principles

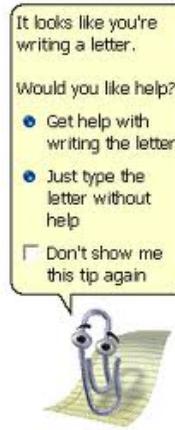
- UI design must take into account the needs, experience and capabilities of users
- Be aware of people's physical and mental limitations
 - e.g. limited short-term memory
- People make mistakes





UI design principles (cont'd)

- User familiarity
 - UI should be based on users' terms and concepts, not computer concepts or jargons
- Consistency
 - Across application
 - Across platform
- Minimal surprise
 - Hint users of results



UI design principles (cont'd)

■ Recoverability

- Allows users to recover from mistakes
- E.g., undo/redo, confirmation of destructive actions, 'soft' deletes, etc.

■ User guidance

- E.g., help systems, on-line manuals, etc.

■ User diversity

- Some users prefer red, others prefer blue, etc.
- Some like small font size, others like large font size

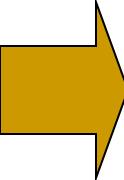
UI design principles (cont'd)

- Determine users' skill levels
 - Novice/first-time users
 - Knowledgeable intermittent users
 - Experts and frequent users
- Identify the tasks
 - Frequent actions
 - Less frequent actions
 - Infrequent actions
- Choose appropriate interaction styles
 - Direct manipulation
 - Menu selection
 - Natural language
 - Etc.

UI design principles (cont'd)

- Prevent errors
 - Constructive and informative error messages
 - Organizing screens and menus functionally
 - Providing feedback about the state of the interface
 - Correct actions
 - E.g., grayed menu items
 - Complete sequences
 - E.g., wizard windows often have both Next and Finish buttons
- Increase automation while preserving human control
 - Auto suggestion
 - Auto completion
 - Allowing users to change

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UI Design Process

- UI design is an iterative process involving close liaisons between users and designers
- Core activities in this process
 - **User analysis**
 - Understand what the users will do with the system
 - **System prototyping**
 - Develop a series of prototypes for experiment
 - **Interface evaluation**
 - Experiment with these prototypes with users

User analysis

- To design effective interface, we need to understand what the users want to do
- User analyses described in terms that users and other designers can understand
- Use case model is common method to describe users

Analysis techniques

- Task analysis
 - Model the steps involved in completing a task
- Interviewing and questionnaires
 - Ask the users about the work they do
- Ethnography
 - Observes the user at work

Interviewing

- Design semi-structured interviews based on open-ended questions
- Users can then provide information that they think is essential
 - not just information that you have thought of collecting

UI prototyping

- UI prototypes allow users to gain direct experience with the interface
- It is difficult to judge the usability of an interface without such direct experience

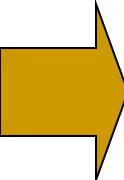
Prototyping techniques

- Script-driven prototyping
 - Scripts and screens using a tool such as Macromedia Director
- Visual programming
 - Use a language designed for rapid development such as Visual Basic
- Mockup
- Paper prototyping

UI Evaluation

- UI needs to be evaluated to check
 - Whether it satisfies usability specification
 - Whether it satisfies users' needs
- Techniques
 - Experts review
 - Users review
 - Field study
 - Surveying users/questionnaire
 - Video recording of users' actions

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Web Usability

- Web UI is a dominating interface currently
- Almost all applications used to run on desktop can be interfaced via Web
- A trend in developing UI for applications
 - Web UI is a first choice for applications
- Web UI is different from traditional desktop-based UI

Web Usability



“On the Internet, nobody knows you’re a dog.”

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From *The New Yorker Book of Technology Cartoons*.

Web vs. Traditional UI Design

- In traditional desktop-based UI:
 - You control each pixel. Web design makes you give up control to meet client/server hardware/software needs
 - You know for what system you are designing. For web design, your result could appear on WebTV!
 - The designer can control where the user goes and when
 - In web navigation, the user has more control of their navigation, and may only stay for a few moments!
 - You are part of an enclosed experience. Obviously not the same for Web design!

Top 10 Mistakes in Web Design (from Jakob Nielsen, 2011)

1. Bad Search
2. PDF Files for Online Reading
3. Not Changing the Color of Visited Links
4. Non-Scannable Text
5. Fixed Font Size
6. Page Titles With Low Search Engine Visibility
7. Anything That Looks Like an Advertisement
8. Violating Design Conventions
9. Opening New Browser Windows
10. Not Answering Users' Questions

Source: <https://www.nngroup.com/articles/top-10-mistakes-web-design/>

Some Web Design Guidelines

- Site tourists: you cannot control the user
- Loyal visitors: you almost want to say "Please bookmark me"
- Avoid frames
- People will not "hang around" if they see the site is not maintained current
- Users are impatient
- Reduce scrolling, especially at the home page
- Avoid animation unless it has a purpose, like showing how a game is played
- Don't animate forever
- Don't do "Enter Here"
- Limit the number of colors used

Some Web Design Guidelines

- A site needs to make clear what it is supposed to do and how it is organized
- Don't match other media, e.g. brochures, TV ad, and push that onto the web page. Do the web first
- Link wisely, not everything. Also, don't just say "click here" without a highlight or reference
- Tell people where you are. Provide navigation buttons and/or site maps.
- On-line survey & forms need smooth interaction, "clear" button, easy to back up and correct, pull down choices, etc.
- Strong metaphor can be "over cute"
- Spend a moment on URL design
- White background preferred with easy-to-read (dark) lettering

Homepage Usability

- The Homepage is the most important page on any web site, giving the user visibility into the sites purpose, navigation, etc
- Homepages due to its importance and role require an extra look in terms of its usability
- Reference: *Homepage Usability, 50 Websites Deconstructed*, Jakob Nielsen, New Riders Publishing, 2002. And www.useit.com

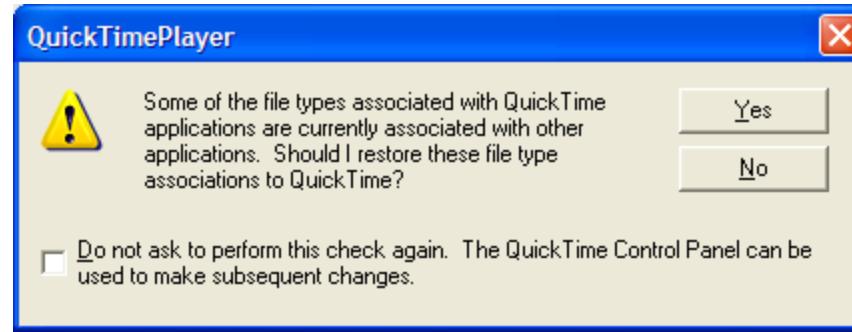
Top 10 Guidelines for Homepage

1. Include a One-Sentence Tagline
2. Write a Window Title with Good Visibility in Search Engines and Bookmark Lists
3. Group all Corporate Information in One Distinct Area
4. Emphasize the Site's Top High-Priority Tasks
5. Include a Search Input Box
6. Show Examples of Real Site Content
7. Begin Link Names with the Most Important Keyword
8. Offer Easy Access to Recent Homepage Features
9. Don't Over-Format Critical Content, Such as Navigation Areas
10. Use Meaningful Graphics

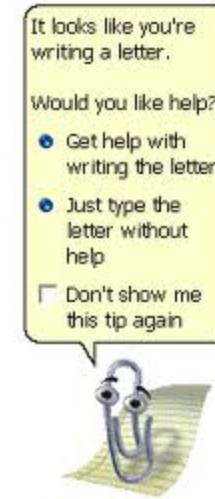
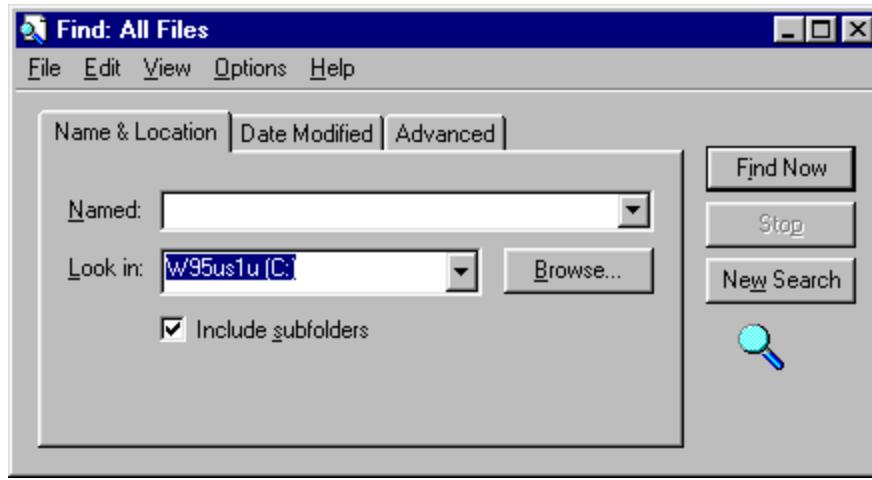
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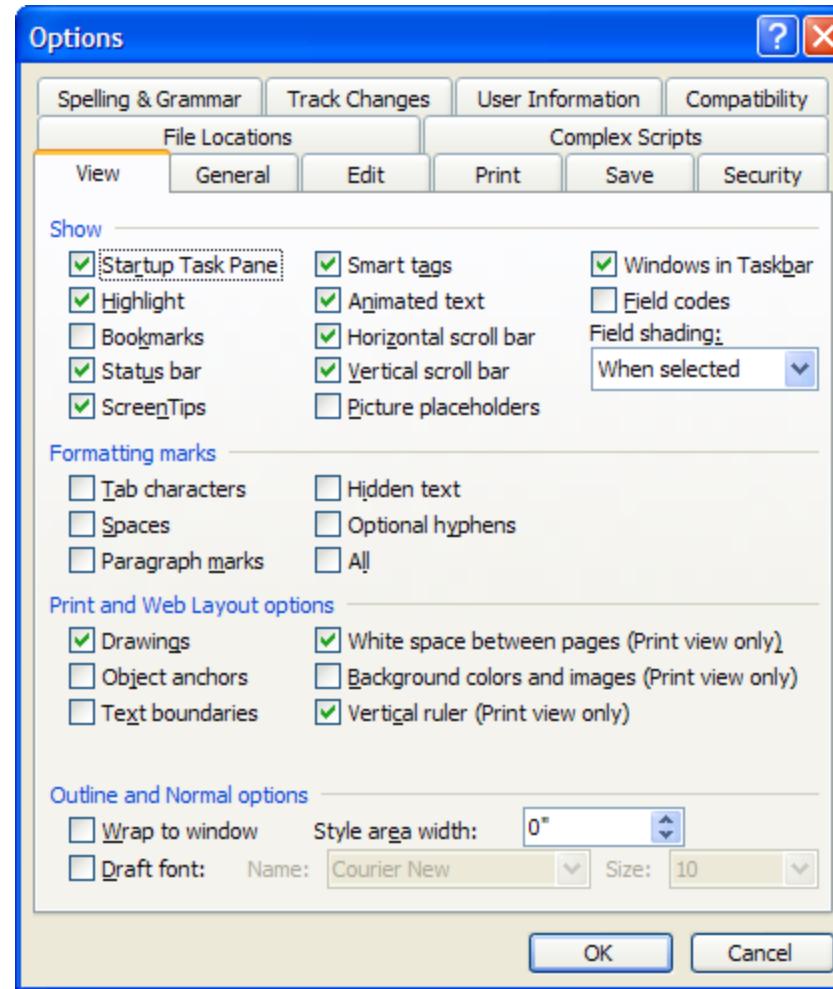
UI Hall of Fame or Shame



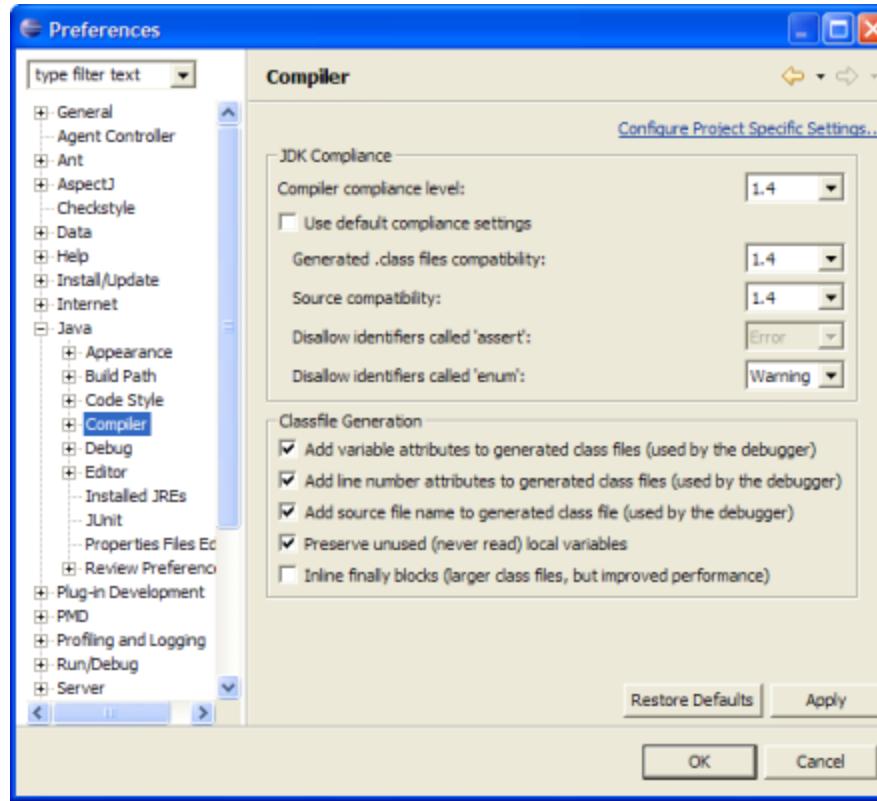
UI Hall of Fame or Shame



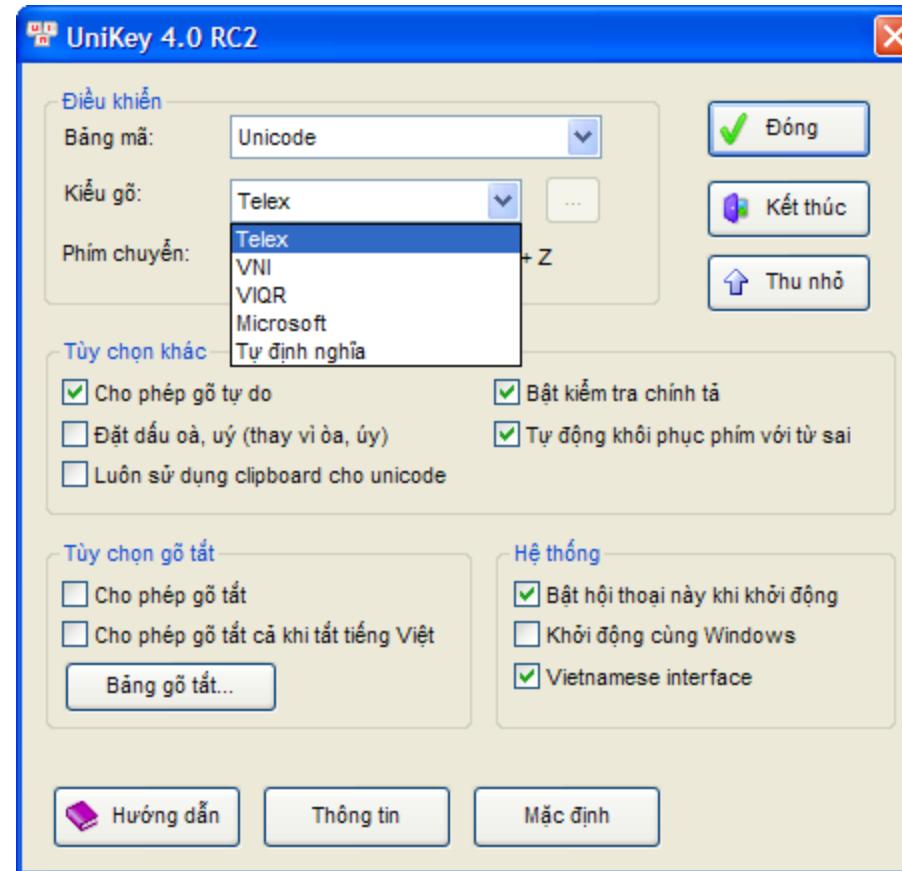
UI Hall of Fame or Shame



UI Hall of Fame or Shame



UI Hall of Fame or Shame



UI Hall of Fame or Shame

Tin nhanh VnExpress - Đọc báo, tin tức online 24h - Windows Internet Explorer
http://vnexpress.net/

VNEXPRESS TIN NHANH VIETNAM

NHOMMUA.com

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Trang nhất | Video | Xã hội | Thế giới | Kinh doanh | Văn hóa | Thể thao | Pháp luật | Đời sống | Khoa học | Vì tinh | Ôtô - Xe máy | Bán độc | Tâm sự | Rao vặt | Cười | RSS | Ebank | Chứng khoán | Bất động sản | Nhà đẹp | Doanh nhân | Quốc tế | Mua sắm | Doanh nghiệp việt

Từ khóa tìm kiếm

Thứ tư, 8/2/2012 | 10:14

'Chúng tôi được chính quyền thuê phá nhà ông Vươn'

Một số người dân tố cáo chính lãnh đạo huyện Tiên Lãng và xã Vinh Quang thuê họ lái máy xúc phá nhà ông Vươn với giá 1,5 triệu đồng dù chính quyền địa phương khẳng định không biết ai phá.

> Hải Phòng nhận trách nhiệm trước Bộ Chính trị
> Sẽ khởi tố vụ phá nhà ông Đoàn Văn Vươn

Quảng Ninh sẽ xây khu casino 4 tỷ USD

Giáo sư Ngô Bảo Châu nhận Bắc Đầu Bội tinh

VFF yêu cầu VPF bỏ tên Super League

Xã hội | Giáo dục | Nhịp điệu trẻ | Du lịch | Du học | Việt Nam mến yêu

Vắc xô, bình đìn xin nước sinh hoạt

Không đúng như cam kết của công ty nước sạch, chiều và tối 7/2 nhiều hộ dân ở các quận, huyện phía Tây Nam Hà Nội vẫn phải nháo nhác đi xách nước về dùng sau 3 ngày vỡ ống dẫn nước từ sông Đà.

> Người Hà Nội náo loạn vì mất nước sinh hoạt

Thế giới | Xuân quê hương | Cuộc sống đô thị | Ánh | Người Việt 5 châu | Phân tích | Tư liệu

Mỹ sắp trao thêm tàu chiến cho Philippines

Mỹ sẽ sớm bàn giao tàu chiến thứ hai cho

Thủ tướng Trung Quốc bảo vệ đất đai của nông dân

Thành ủy Hải Phòng nhận trách nhiệm trước Bộ Chính trị

Hàng loạt lãnh đạo huyện Tiên Lãng bị đình chỉ công tác

Vácxô, bình đìn xin nước sinh hoạt

Nhiều cán bộ quản lý đất bị kỷ luật

Xe tải đầu đầu, đường bộ và đường sắt tắc nghẽn

Thành ủy Hải Phòng nhận trách nhiệm trước Bộ Chính trị

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17°C | Nhiều mây, không mưa | Hà Nội

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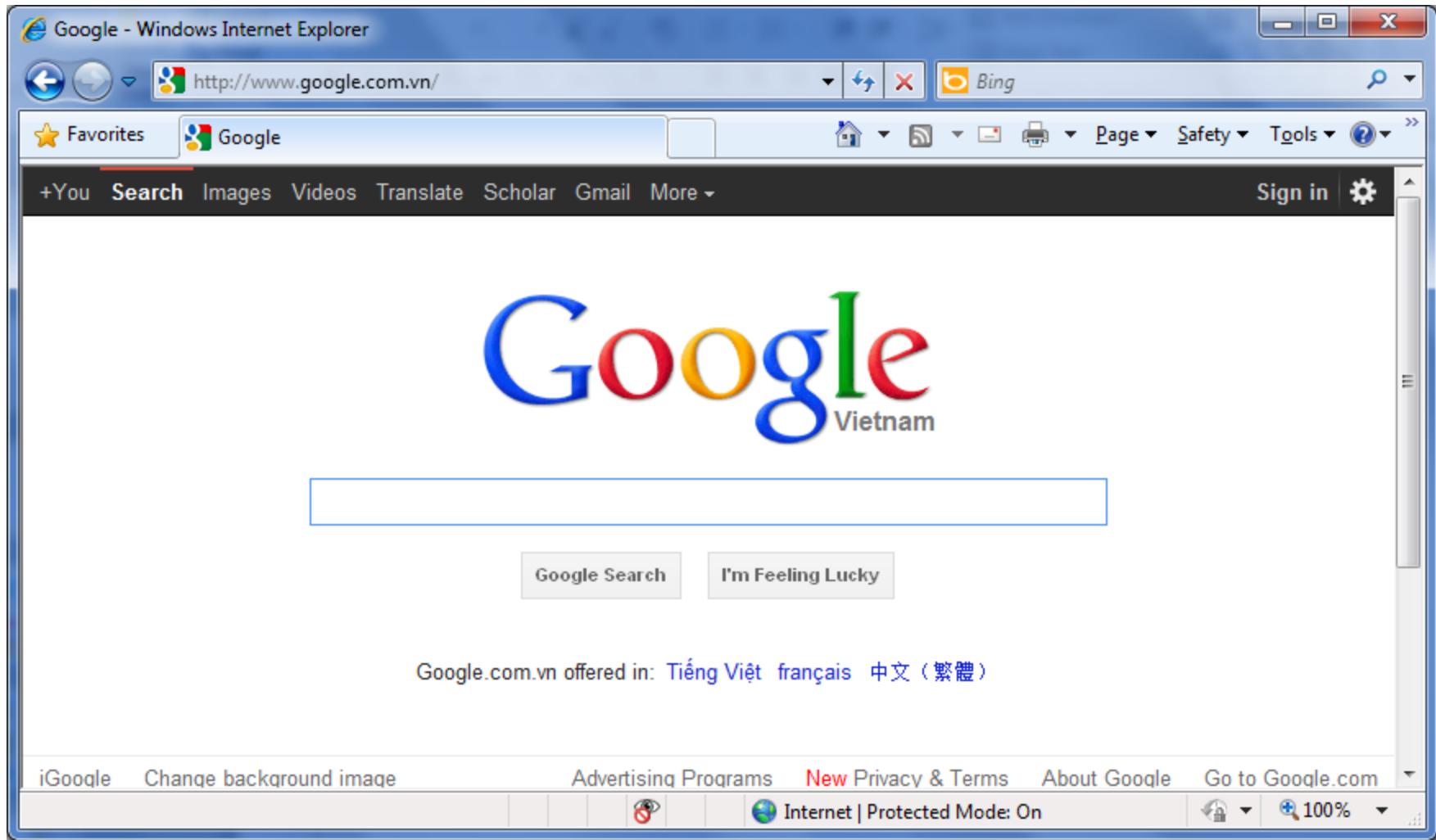
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Vui tết sum vầy
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Internet 100% 44

UI Hall of Fame or Shame



UI Hall of Fame or Shame

The screenshot shows a Windows Internet Explorer window displaying a Vietnamese mobile phone store website, [thegioididong.com/dtdd](http://www.thegioididong.com/dtdd). The page features a large yellow advertisement for the HUAWEI Vision smartphone, highlighting its "GIAO DIỆN 3D ĐỘC ĐÁO" (3D unique interface) and a pre-order price of 3,300,000 VND. Below the ad, there's a search bar and a grid of 21 mobile phone products. The sidebar on the right contains promotional banners for "Thông tin đặt hàng" (Order information), "Giá rẻ hôm nay" (Today's low price), and "Tư vấn đặt hàng online GIÁ RẺ HƠN" (Online consultation for lower prices). It also lists customer service numbers (1900.561.292, 08.38.102.102, 1900.1887) and a "Hỗ trợ khách hàng CAM KẾT TẬN TÂM" (Customer support guarantee). A small inset window in the bottom right corner shows a different website, Dienmay.com, advertising online shopping with a 49% discount.

Điện thoại di động, điện thoại di động, giá điện thoại, điện thoại, giá điện thoại, điện thoại - Windows Internet Explorer

http://www.thegioididong.com/dtdd

Favorites Điện thoại di động, điện thoại di động, giá điện thoại, ...

Tin tức Điện thoại Laptop Máy tính bảng Camera Giải trí số Diễn đàn

Điện thoại + Giải trí số + Khuyến mãi + Tư vấn tiêu dùng + Bài viết đánh giá + Hỗ trợ khách hàng

Trang chủ > Sản phẩm > Điện thoại > Điện thoại di động

HUAWEI VISION
Smartphone
GIAO DIỆN 3D ĐỘC ĐÁO
ĐẶT HÀNG TRƯỚC nhận ưu đãi đến 3.300.000đ

KHUYẾN MÃI ĐỌC NHIỀU TIN MỚI

- Tablet Acer Iconia A101 – Lì xì tết đến 1.200.000 VND
- Tổng hợp khuyến mãi ĐT tại Thegioididong.com
- Mua máy tính bảng iPad nhận bộ quà hơn 9 triệu
- Mở cửa phục vụ đến 12h đêm
- Dienmay.com bổ sung thêm 2 siêu thị vào hệ thống bán lẻ điện máy toàn quốc

Xem tất cả

Tùy chọn: Tất cả các hàng Giá từ ... Giá đến ... Tim kiếm Tim mở rộng

(174 Điện thoại di động đang bán)

Tất cả Giá giảm dần

Điện thoại siêu cấp (>10tr) (21 sản phẩm)

Hiển thị: 21/21

iPhone 4 32GB	iPhone 4 16GB	Samsung Galaxy Note N7000	HTC EVO 3D	iPhone 4 8GB
18,999,000 VNĐ	16,500,000 VNĐ	15,999,000 VNĐ	15,890,000 VNĐ	15,500,000 VNĐ

BlackBerry Bold Touch 9900	Nokia N9 64GB	HTC Sensation	HTC Desire HD	Samsung Galaxy I9100G
14,690,000 VNĐ	13,999,000 VNĐ	13,999,000 VNĐ	12,499,000 VNĐ	12,499,000 VNĐ

Done

Thông tin đặt hàng

- Giỏ hàng của bạn
- Cách giao hàng & thanh toán
- Xác nhận đơn hàng Xem hướng dẫn đặt hàng

Click **Giá rẻ hôm nay**

Tư vấn đặt hàng online **GIÁ RẺ HƠN**
1900.561.292
hoặc: **08.38.102.102**
(7:30 - 22:00 cả CN & ngày lễ)

Hỗ trợ khách hàng **CAM KẾT TẬN TÂM**
1900.1887
(8:00 - 21:30 cả CN & ngày lễ)
Gửi khieu/nai / Góp ý / Hỗ trợ KT

Hàng sản xuất điện thoại di động

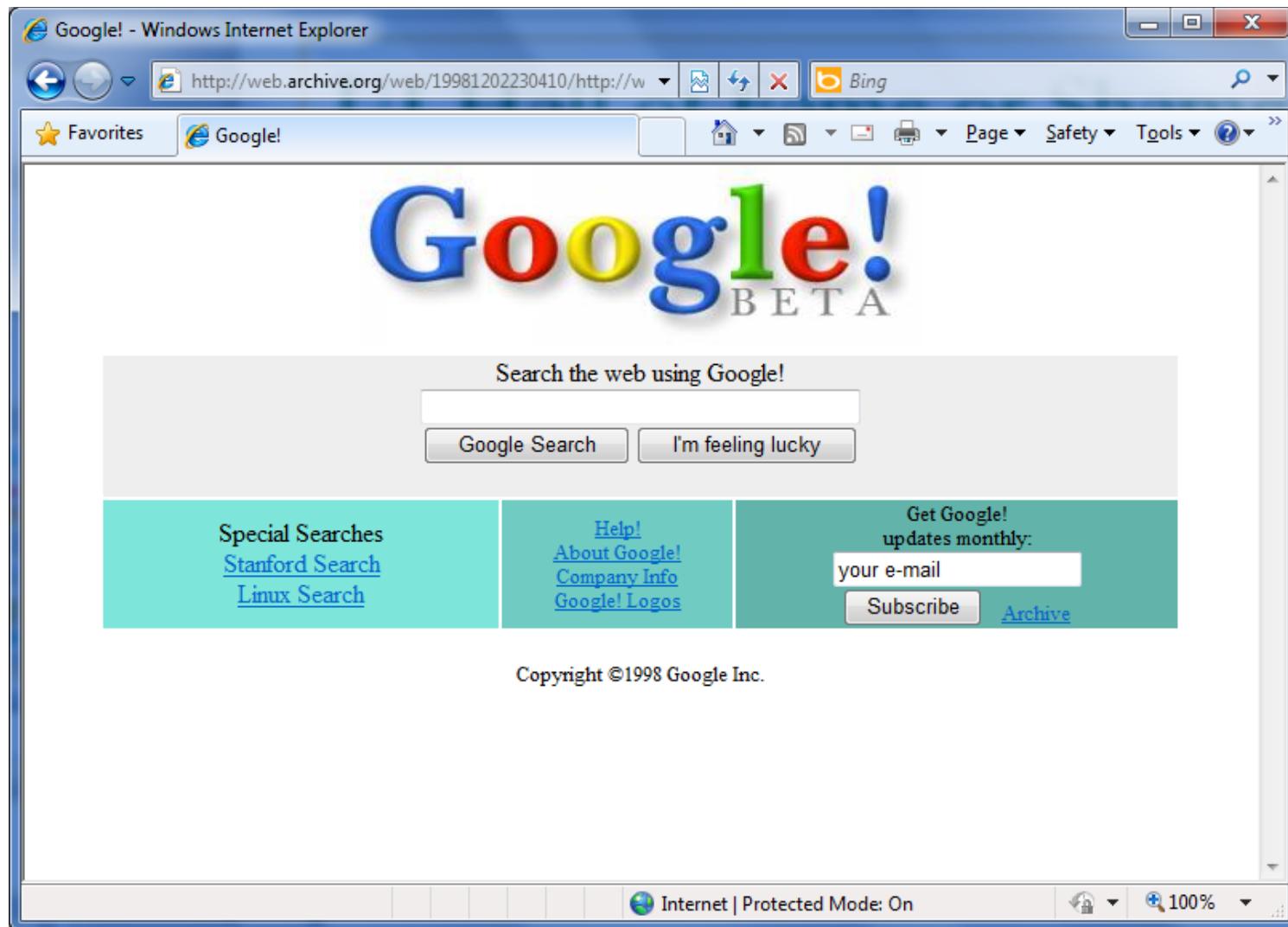
Nokia HTC
LG Motorola
Samsung Acer

Dienmay.com

Mua hàng online giá rẻ hơn

49%

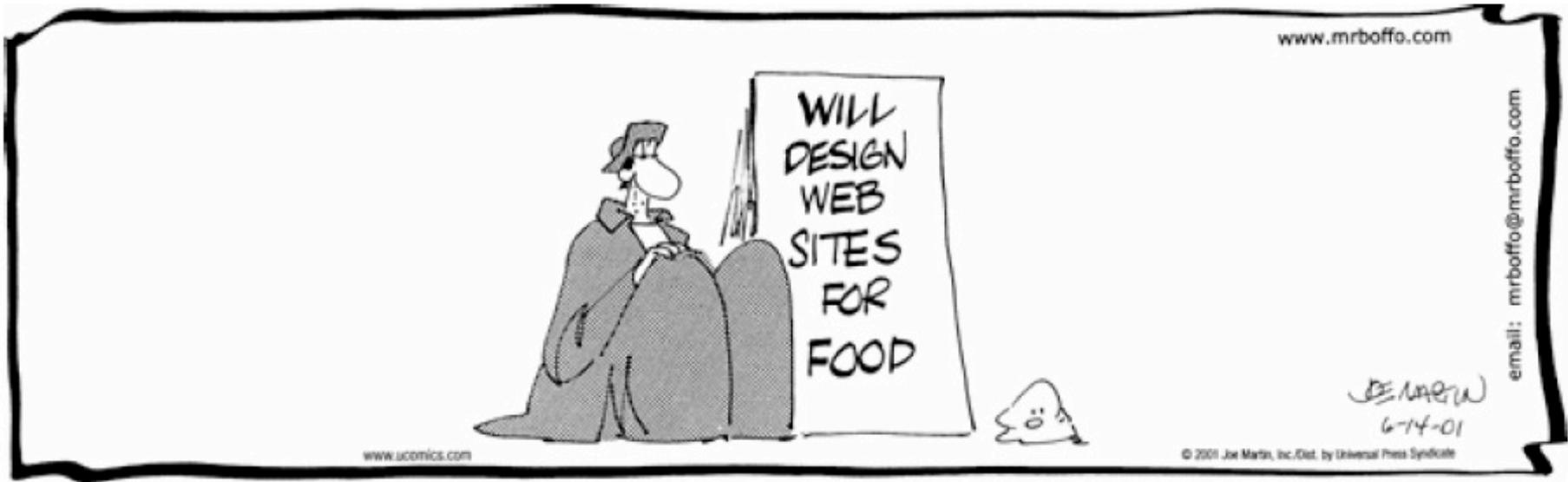
UI Hall of Fame or Shame



Bad or Good?



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From *The New Yorker Book of Technology Cartoons*.



References

- Jakob Nielsen's website: www.useit.com
- Usable Web: www.usableweb.com
- B. Shneiderman, C. Plaisant, "Designing the User Interface: Strategies for Effective Human-Computer Interaction", 4th Ed., Addison Wesley, 2004