

Information Accessibility: *Universal Design for All*



Prof. T.H. Tse

Honorary Professor

Department of Computer Science

The University of Hong Kong

About the Speaker

Teaching

- ◆ *Best teacher award*
- ◆ Teacher effectiveness
95.2%, 95.0%, and 89.6%
in recent years.



About the Speaker

Research

- ◆ *Ranked internationally as no. 2* among experts in test cases.

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UQ'S \$30M SCHOLARSHIP GOAL

THE AUSTRALIAN
WEDNESDAY, JUNE 5, 2019 • 26
theaustralian.com.au/higher-education

Hyphens mess with research citations: study

TIM DODD
HIGHER EDUCATION EDITOR

Researchers at the University of Wollongong have questioned the accuracy of the globally accepted measure for the quality of research — that is, counting the number of times a paper is cited by other scholars.

A study led by Zhi Quan (George) Zhou, from Wollongong's school of computing and information technology, claims the algorithms used by the world's two major citation databases, Scopus and Web of Science, are confused by hyphens in the titles of academic papers.

If so, this means papers with hyphens in the title are not credited by Scopus and Web of Science with all the citations they receive from other researchers.

Professor Zhou said that his team's work challenged the validity of accepted measures of research excellence that are used to rank universities, measure the impact of academic journals and evaluate the performance of research staff.

"Our research questions the common belief that citation counts are a reliable measure of the contribution and significance of papers, as they can be distorted simply by the presence of hyphens in paper titles, which has no bearing with the quality of research," he said.

"They also challenge the validity of citation-based journal-level metrics, including the journal impact factor. Thus the citation counts and journal impact factors commonly used for staff evaluations in universities are not as robust as widely believed."

Scopus research citation statistics are used by two leading universities, ranking organisations, Times Higher Education and QS.

Another critical measure in the academic world, the journal impact factor (which shows the standing of a scientific journal), is based on the Web of Science.

Individual academics also place high importance on the accuracy of citation counts because they are used to judge their research, success through metrics such as the H-index, which measures both the quality of their work and its impact.

Professor Zhou, together with PhD research student Matt Witherside and Professor Tim Tse from the University of Hong Kong, found that the use of hyphens in the title of a paper increased the possibility of it being copied inaccurately when it was cited by other researchers in their papers.

Hyphens were often dropped, or replaced with colons, and algorithms used by Scopus and Web of Science did not reliably correct the error, the researchers said.

"Our in-depth analysis revealed substantial defects in Scopus and Web of Science, resulting in erroneous citation statistics for papers with hyphens in the titles," Professor Zhou said.

His research team also conducted further analysis to ensure their findings were not equating correlation with causation.

Their paper, Metamorphic Relationships: Testing Exposing Hidden Defects in Citation Statistics and Journal Impact Factors, is published in the journal IEEE Transactions on Software Engineering.

A spokesman for Elsevier, which publishes Scopus, said a recent study had found that hyphens in the titles of papers did not play a role in "biased reference matches".

"Our algorithms cope with various kinds of punctuation because that is where authors differ the most from the official title," he said.

However, the spokesman said he believed Professor Zhou's paper was serious and cautious in its claims, and Elsevier would conduct a deeper analysis.

Clarivate, which publishes the Web of Science database, rejected the claims in Professor Zhou's paper.

"We do not rely on article title to unify citation to source records in the Web of Science, as this field can be ambiguous and prone to error, so hyphens alone in a cited reference article title will not prevent a cited reference from linking to a source," a spokeswoman said.

"Therefore hyphens in the article title have no impact on citation counts within the journal citation report, or the journal impact factor."

Tilly Cooper was 17, studying first-year commerce at the University of Queensland and combining it with an internship at a Brisbane finance company, when she realised that one of those commitments was a lot more rewarding than the other.

"I really liked the work aspect

and looking forward to welcoming the first intake of the program proper, which will focus on those wanting digital careers."

PwC opens applications this week for positions in its Sydney and Melbourne offices, to start in January next year.

The firm's national skills lead, Sue Caplan, was prime mover in the first iteration of the scheme when she worked in the British office, turning her background in

There is growing interest in higher apprenticeships across the board

providing an alternative route.

"Some people may not want to go to university, some might not be able to. This takes you straight into work, getting qualifications on the job, and the benefits of work and experience."

school-leavers thought it was radical for her to opt for an 18-month TAFE NSW diploma in business while working at PwC instead of going to university.

"They've really come around," she says. "A friend who has just done a vacation program here said it was awesome and exactly where they want to be — but it will be in four years."

PwC expects about 30 candidates will enter its new two-year

acquisition director Julie Duncan.

"We have to make sure we have a different number of talent channels. We also need more tech students now, so the TAFE option gives us the chance to grow our own."

Recruiters will be looking for candidates with attributes such as creativity, problem solving, critical thinking and communication. The pilot cohort, made up of school-leavers, the unemployed,



Tilly Cooper, who opted for the apprenticeship at 17, says: 'I was learning at a lot more accelerated pace on the job'

PwC taps into alternative pathways for talent

JILL BOWTHILLAM
HIGHER EDUCATION WRITER

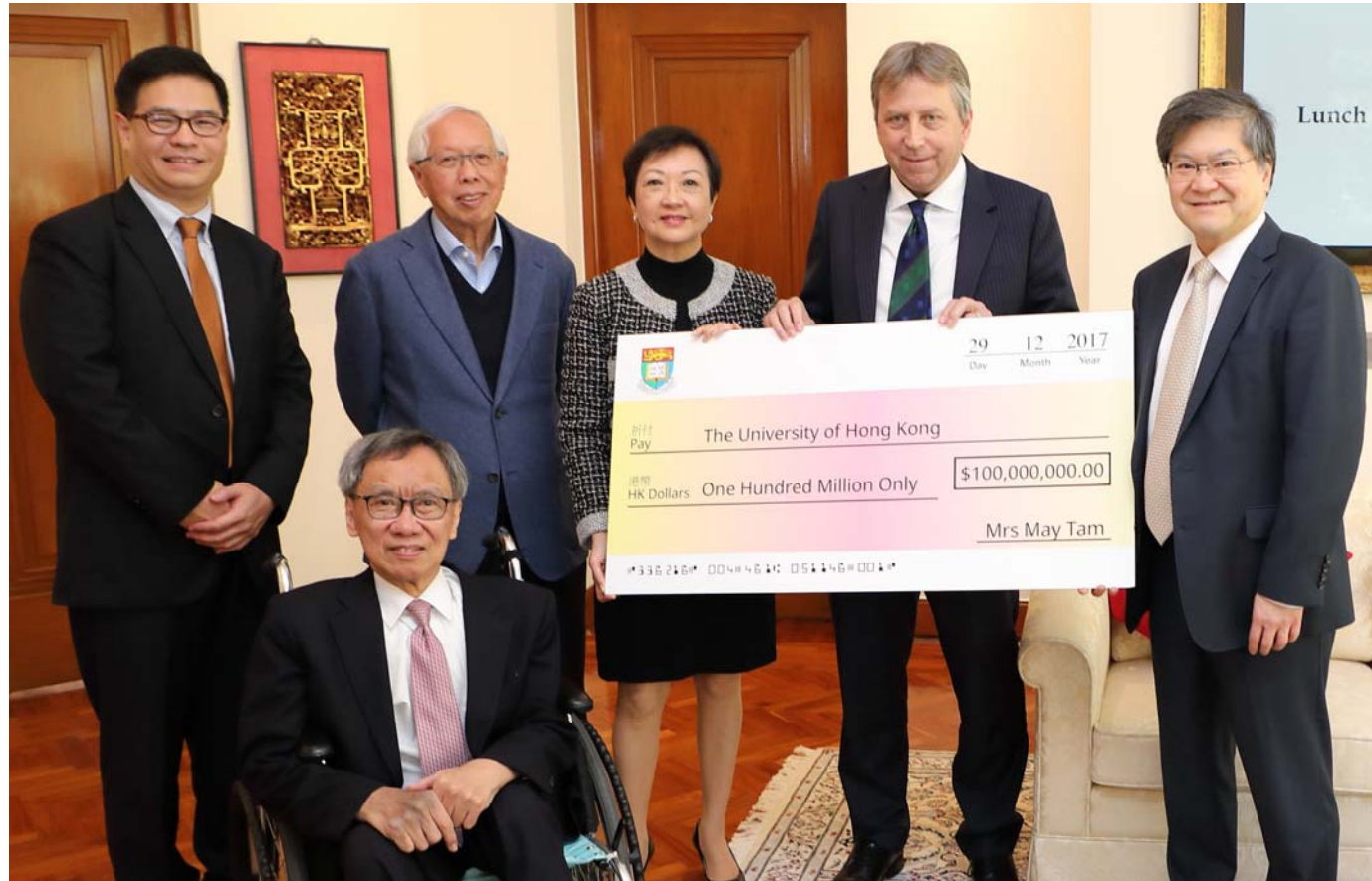
Tilly Cooper was 17, studying first-year commerce at the University of Queensland and combining it with an internship at a Brisbane finance company, when she realised that one of those commitments was a lot more rewarding than the other.

"I really liked the work aspect

About the Speaker

Administration

- ◆ *Matchmaker of \$100,000,000 donation* for The University of Hong Kong.



Track Record

Web Accessibility Recognition Scheme

- ◆ *Triple Gold Award* for Hong Kong Society for Rehabilitation main website
- ◆ *Triple Gold Award* for The University of Hong Kong main website.

Presentation Outline

- ◆ Accessibility issues
- ◆ We learn from mistakes
- ◆ Why information accessibility
- ◆ Common approaches to text display
- ◆ Simple technique to test web accessibility
- ◆ Plain text web pages?
- ◆ Hypertext Markup Language (HTML)
- ◆ Cascading Style Sheets (CSS)
- ◆ Searchable PDF files.

Accessibility Issues

for People with and without a Disability

- ◆ Accessibility route
- ◆ Accessible transport
- ◆ Accessible toilet
- ◆ Accessible information.

Accessible Route

- ◆ Ramp

- ◆ Universal design

Special route

Full integration



Accessible Transport

- ◆ Rehabus

*Special
transport*

- ◆ Accessible
mass transit

*Full
integration*



Accessible Toilet

- ◆ Toilet for people with a disability
- ◆ **Family toilet**



Special toilet

Full integration



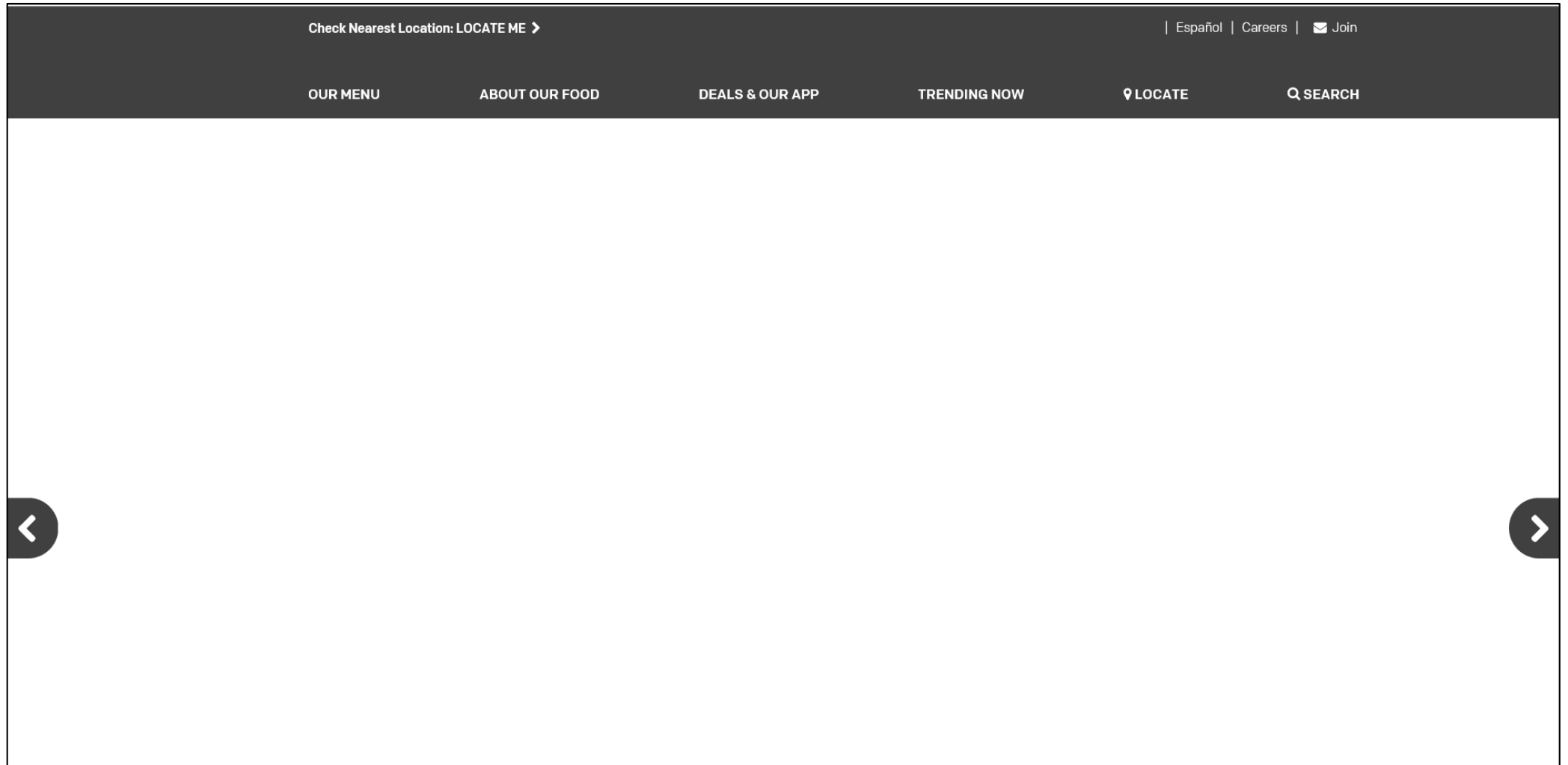
Accessible Information

 *Special information?*

Full integration?

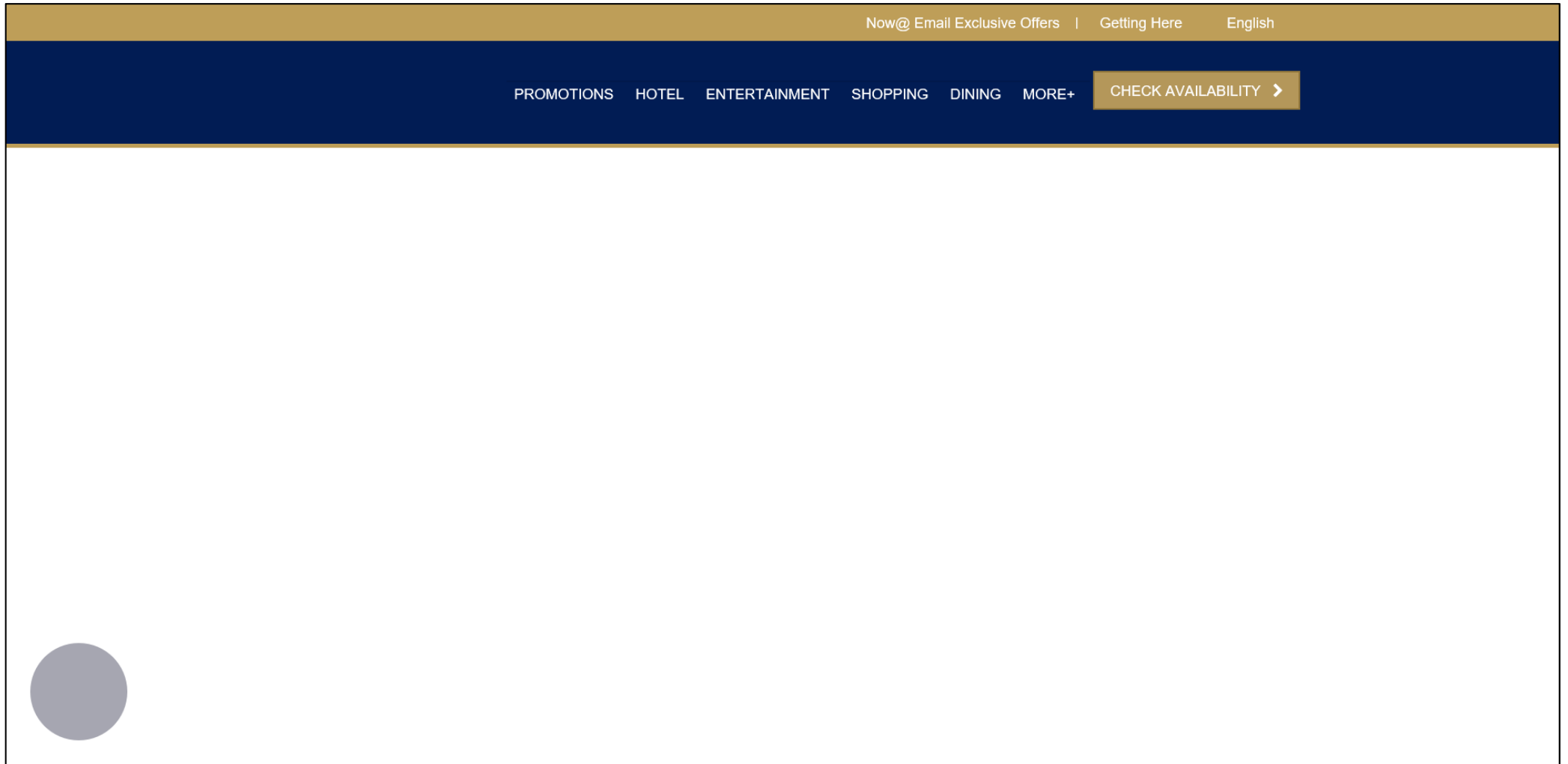
We Learn from Mistakes

Chain of Hamburger Restaurants

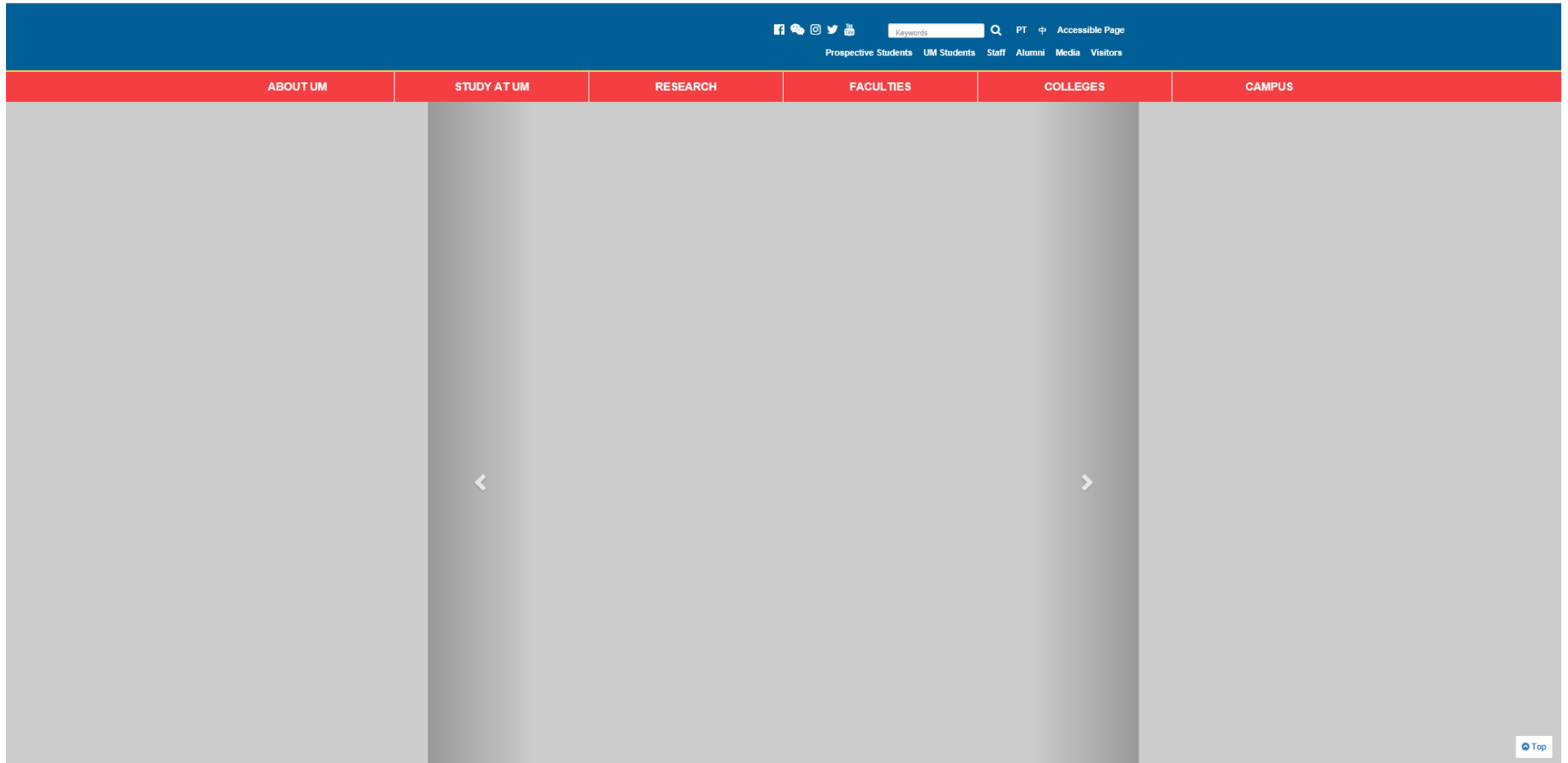


We Learn from Mistakes

Hotel



We Learn from Mistakes University



Why We Need Web Accessibility

Screen Reader

- ◆ Application software that converts *standard text* output into *voice or Braille*
- ◆ Cannot not really “read” the “screen”
- ◆ Used by
 - People with visual impairment (including total blindness)
 - People with learning difficulties
 - People who are illiterate.

Why We Need Web Accessibility

- ◆ For people with visual impairment (including total blindness)

Social responsibility?

Social asset!

Financial asset! .

INVESTMENT BANKING

Managing Risk for JPMorgan, and Blindness

By JULIA WERDIGIER DECEMBER 2, 2010 7:34 PM 44 Comments



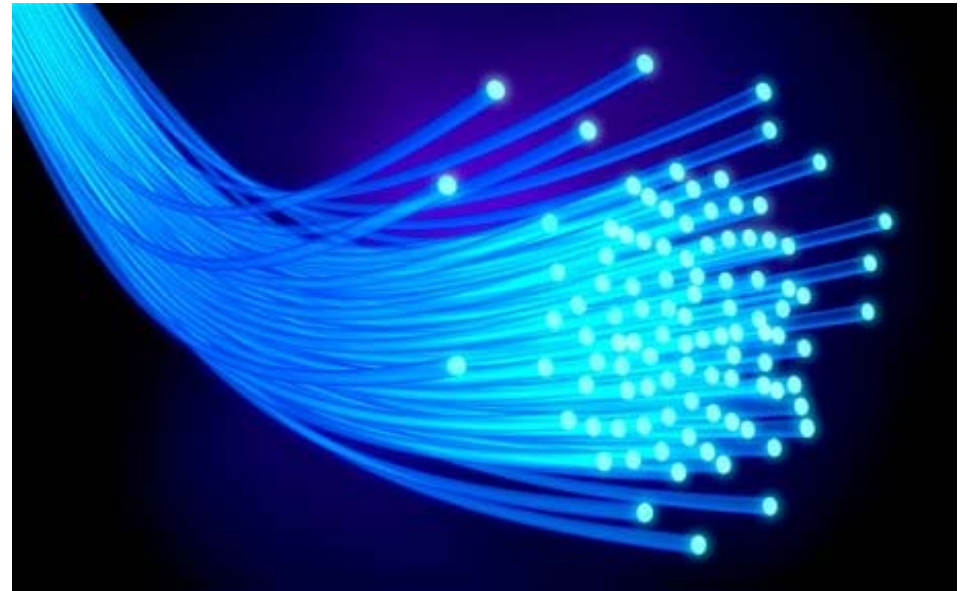
Andrew Testa for The New York TimesAshish Goyal at JPMorgan Chase in London. His computers can read information to him rapidly through a headset.

LONDON — As a trader at JPMorganChase in London, Ashish Goyal helps manage billions of dollars of the bank's exposure to risks like foreign exchange fluctuations. In his spare time, he takes tango lessons, plays cricket and goes clubbing with friends. Mr. Goyal is also blind.

Why We Need Web Accessibility

Continued

- ◆ For people who use slow modems
 - We need credit cards to apply for broadband
 - People in poverty do not have credit cards
 - They turn off the images



Social responsibility?

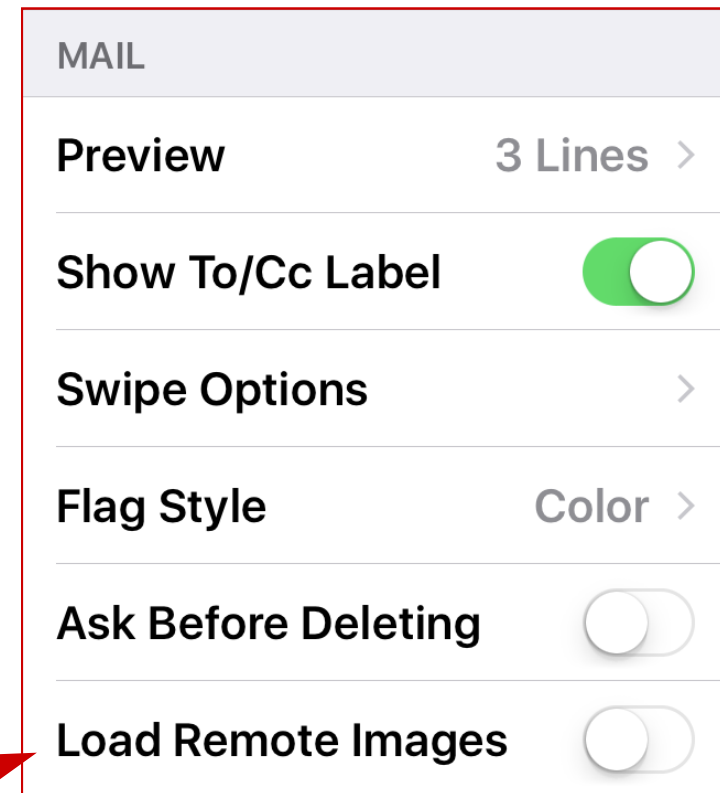
Social asset! .

Why We Need Web Accessibility

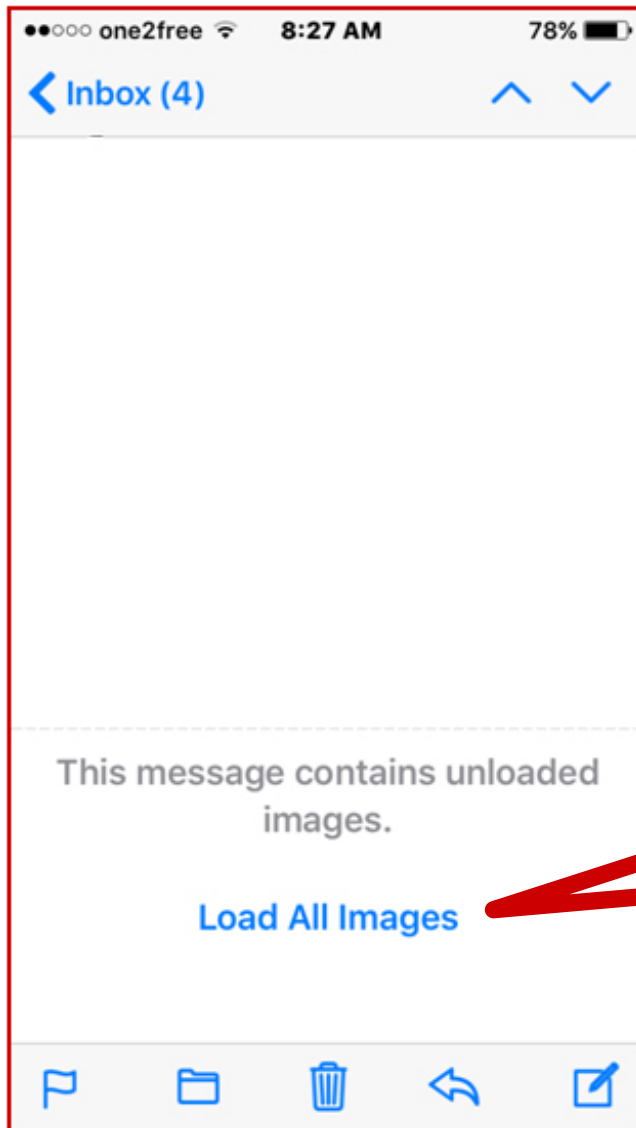
Continued

- ◆ For people using portable devices, who may turn off images to reduce security risk or cellular data charge

Financial asset! .



We Learn from Mistakes

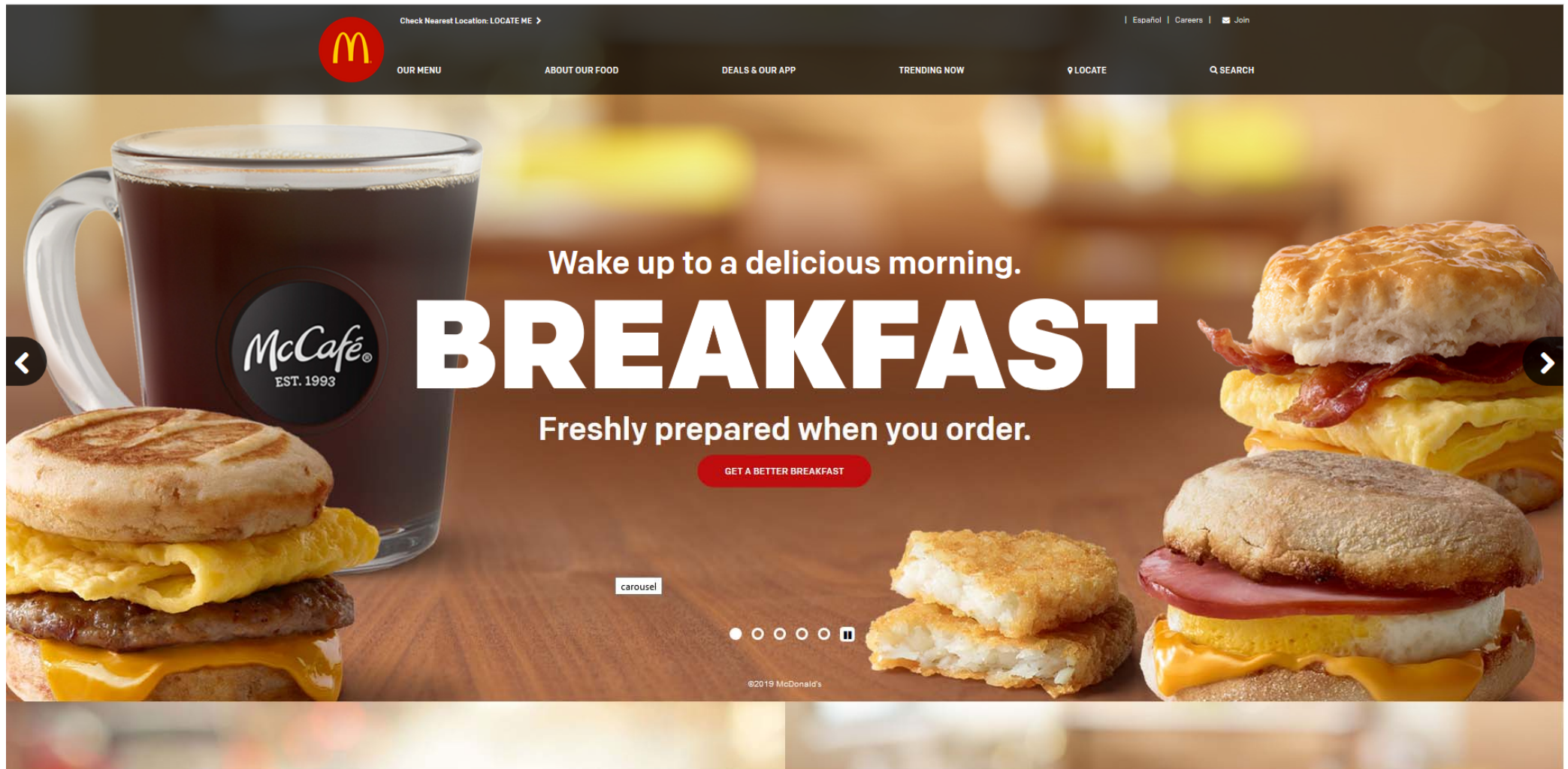


Who will load the image if they have no idea of the message content?

Simple Technique to Test Web Accessibility

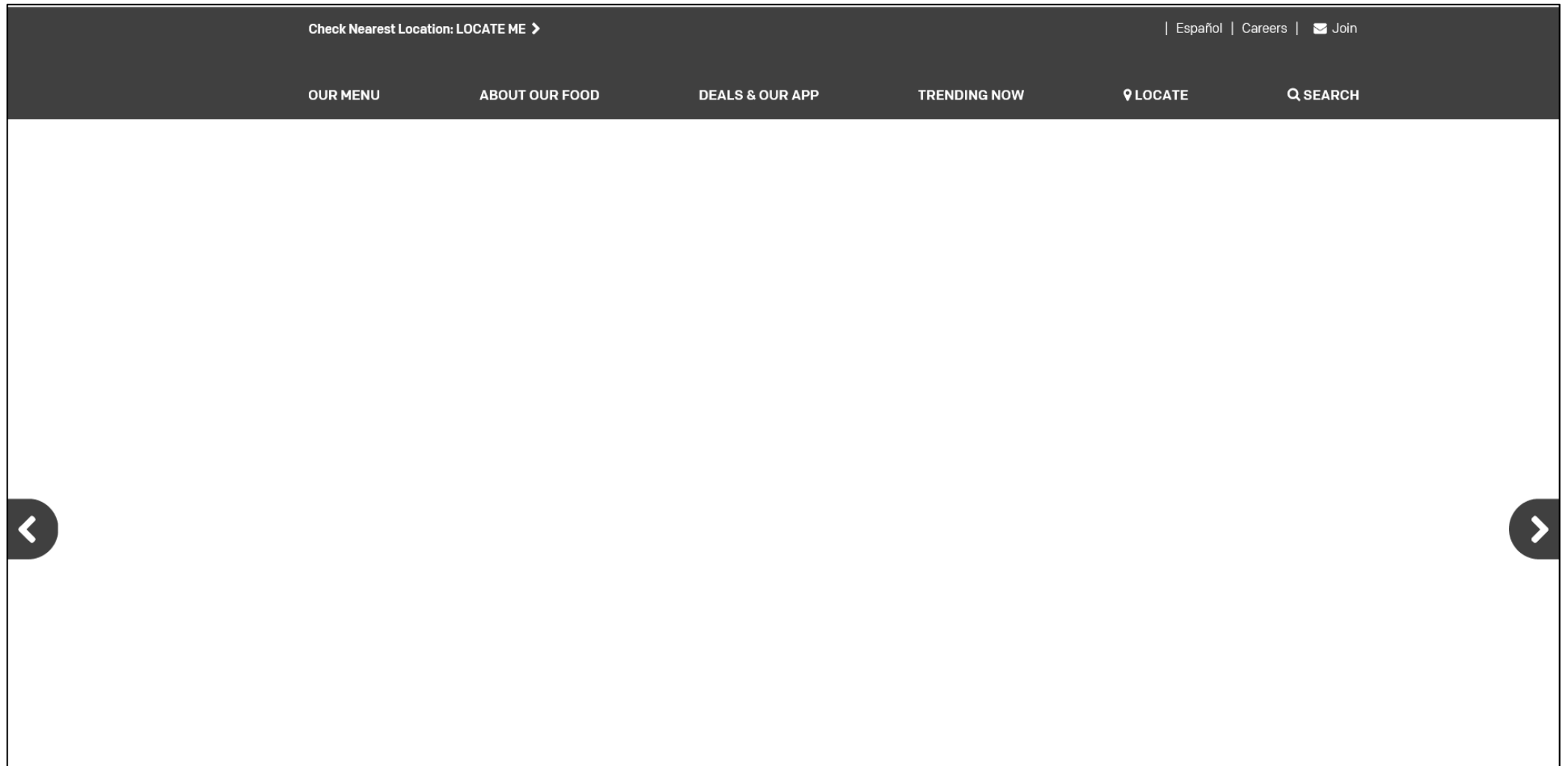
- ◆ Open Internet Explorer
- ◆ Click “Tools” → “Internet options”
→ “Advanced” tab
- ◆ *Turn off “Show pictures”*
- ◆ Open the web page.

Example



Example

(*“Show Pictures” Turned Off*)



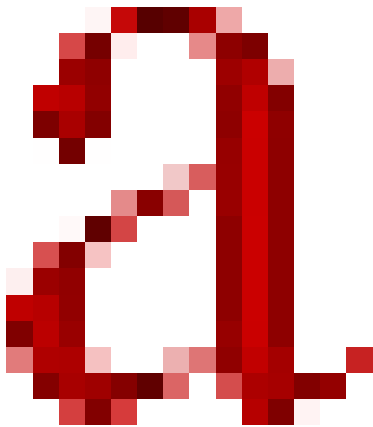
Common Approaches to Text Display

- ◆ *Raster graphics*
- ◆ *Vector graphics*
- ◆ *Plain text*
- ◆ *Styled text.*

Common Approaches to Text Display

Raster Graphics

- ◆ Text and images composed by a dot matrix data structure representing rectangular grid of pixels



- ◆ *Examples:* jpg, gif, bmp formats.

Raster Graphics

- ◆ Most commonly used in web page banners



The University of Hong Kong

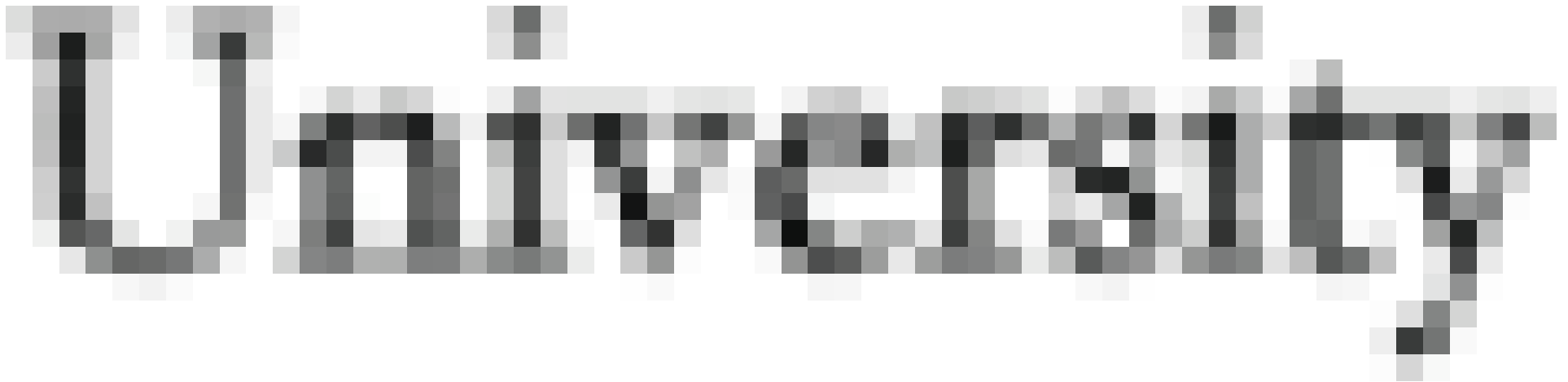


Making Web Content Available for All
上網無阻礙 障健任通行

Raster Graphics

Disadvantages

- ◆ Cannot be enlarged indefinitely



Raster Graphics

Disadvantages

- ◆ Cannot be enlarged indefinitely



Raster Graphics

Disadvantages

- ◆ Cannot be enlarged indefinitely
- ◆ Cannot search for required text
- ◆ Cannot copy and paste the text
- ◆ Not accessible by screen readers.

Raster Graphics

Disadvantages

- ◆ Cannot be enlarged indefinitely
- ◆ Cannot search for required text
- ◆ Cannot copy and paste the text
- ◆ Not accessible by screen readers

Advantages

- ◆ ~~Easy to generate?~~
No advantages! .

Common Approaches to Text Display

Vector Graphics

- ◆ Text and images represented by geometrical primitives such as lines and curves



Vector Graphics

◆ *Examples*

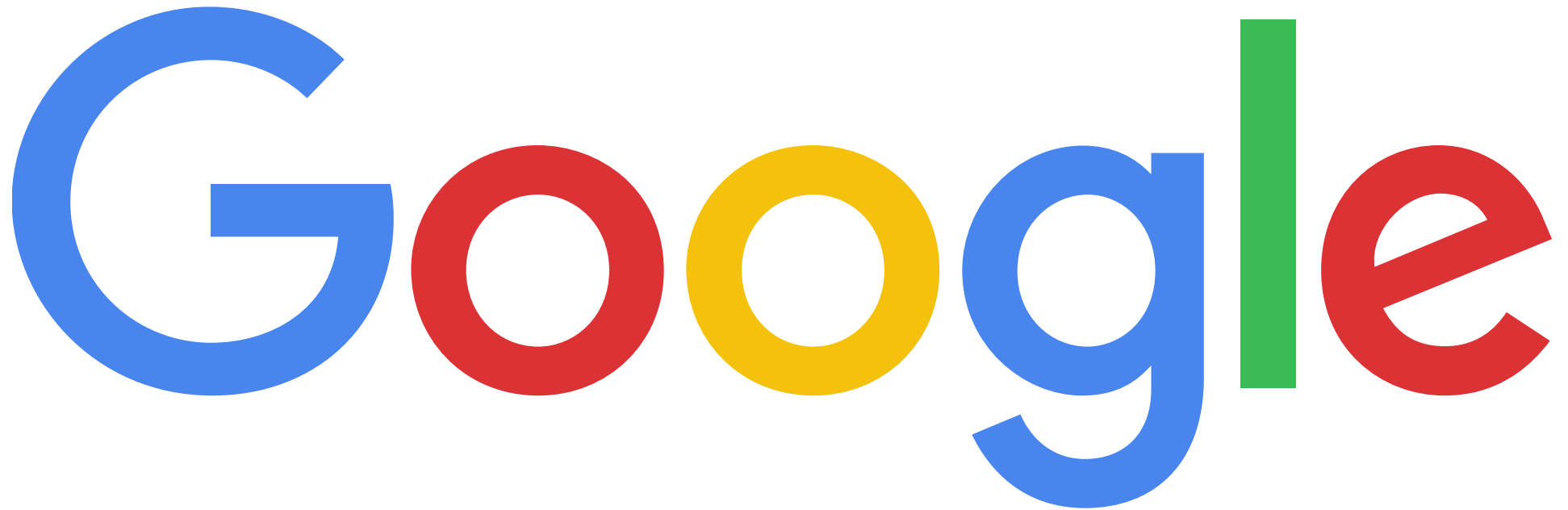
- Adobe Illustrator outline format
 - svg format
 - Properly generated pdf, eps, and emf formats
- ◆ Most commonly used in professional printing



Vector Graphics

Advantages

- ◆ Can be enlarged indefinitely



Vector Graphics

Advantages

- ◆ Can be enlarged indefinitely

Standard
Chartered

Vector Graphics

Advantages

- ◆ Can be enlarged indefinitely

Disadvantages

- ◆ Cannot search for required text
- ◆ Cannot copy and paste the text
- ◆ Not accessible by screen readers.

Common Approaches to Text Display

Plain Text

- ◆ .txt format
- ◆ The most common approach for “accessible Web pages”



Due to serious misunderstanding!! .

Plain Text

Advantages

- ◆ Can be enlarged indefinitely
- ◆ Can search for required text
- ◆ Can copy and paste the text
- ◆ Accessible by screen readers.


Plain Text

Disadvantages

- ◆ Dull and boring
- ◆ Double the work
 - English version
 - Traditional Chinese version
 - Simplified Chinese version
 - English text version
 - Traditional Chinese text version
 - Simplified Chinese text version
- ◆ Against the principle of “universal design for all”.

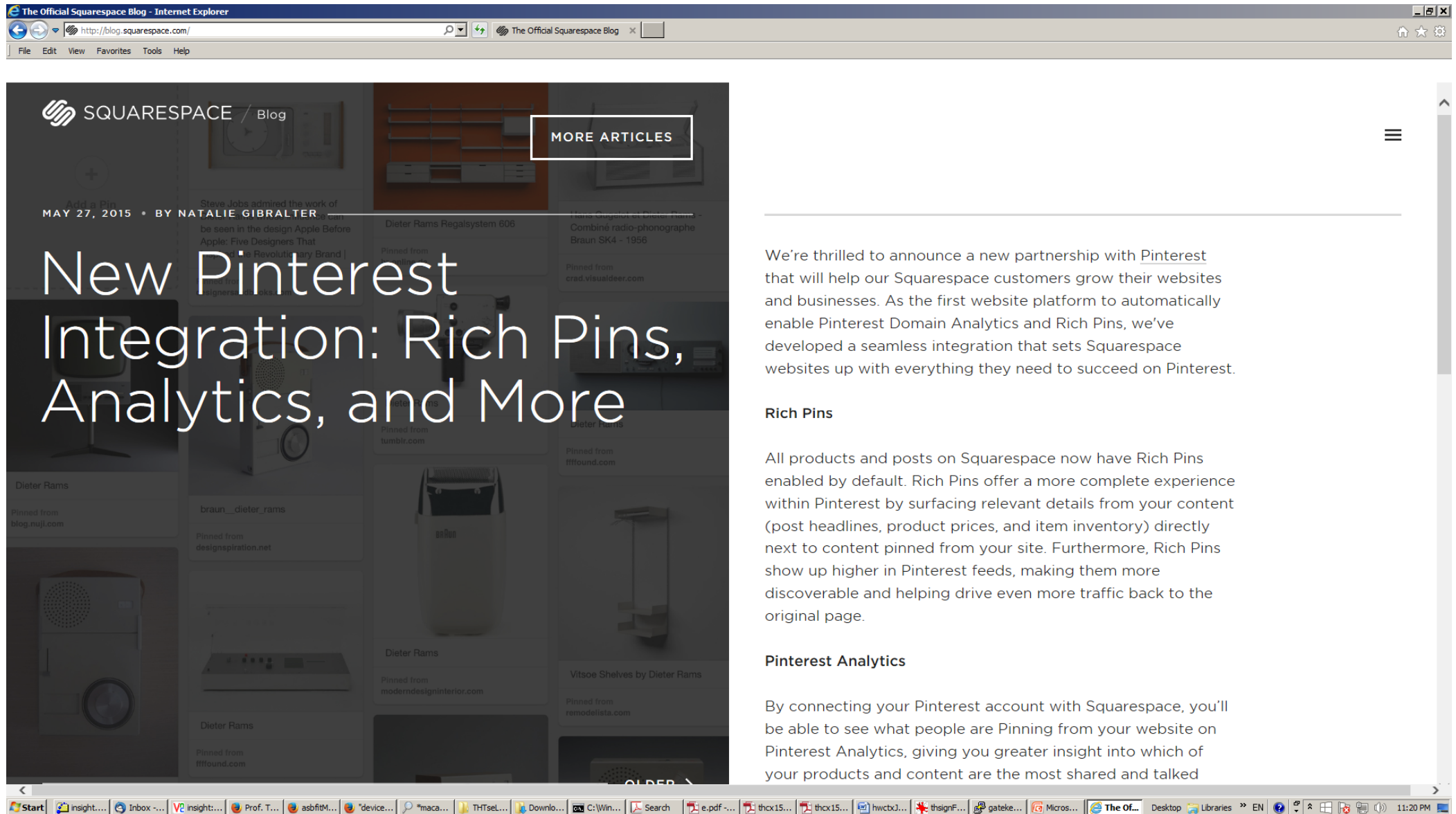
Common Approaches to Text Display

Styled Text

- ◆ Format the text using
 - *Hypertext Markup Language (HTML)* and/or
 - *Cascading Style Sheets (CSS)* 
- ◆ Recommended by World Wide Web Consortium (W3C)
- ◆ Can be applied to banners also.

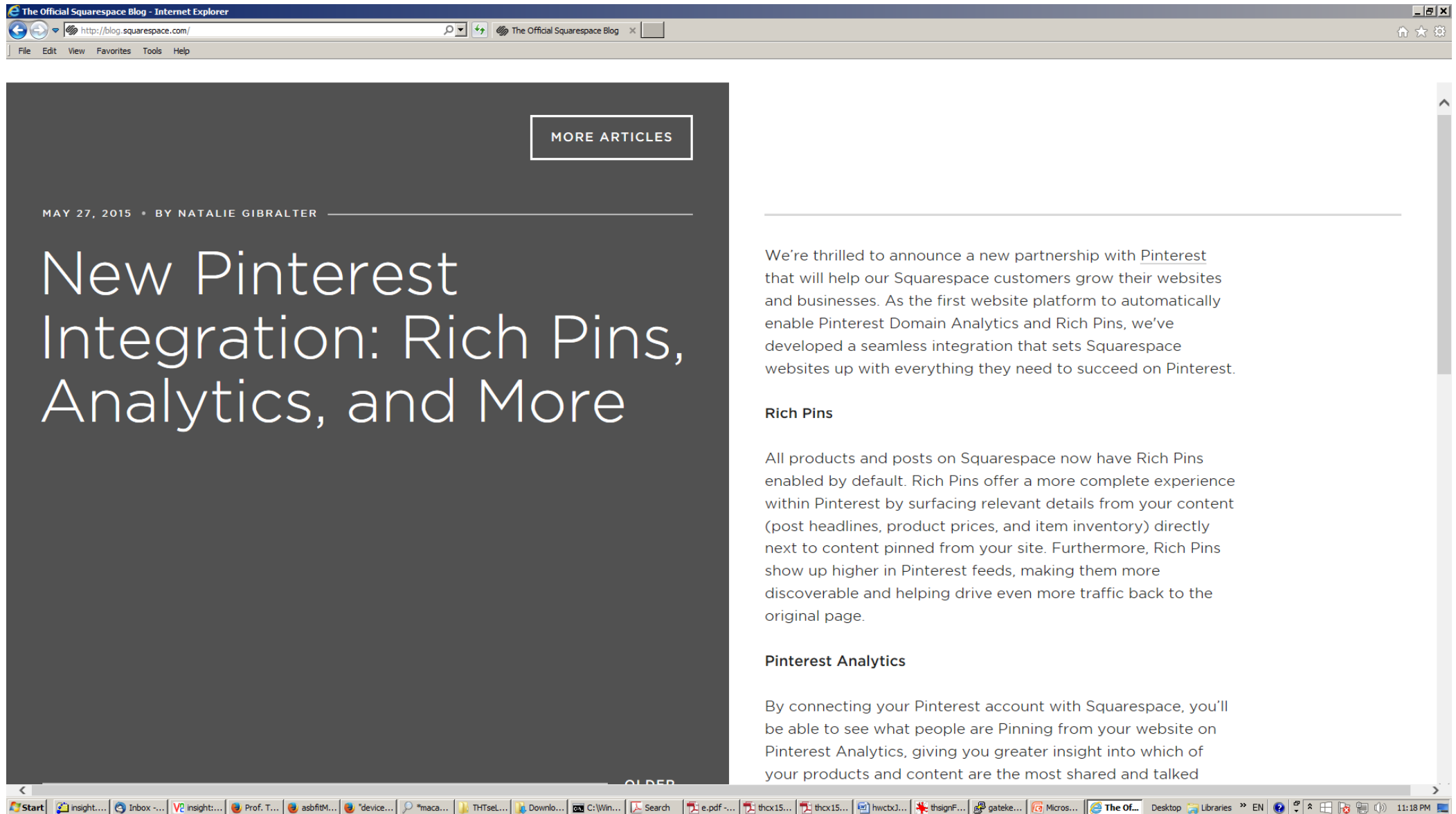
Using HTML to Format the Text

Example 1



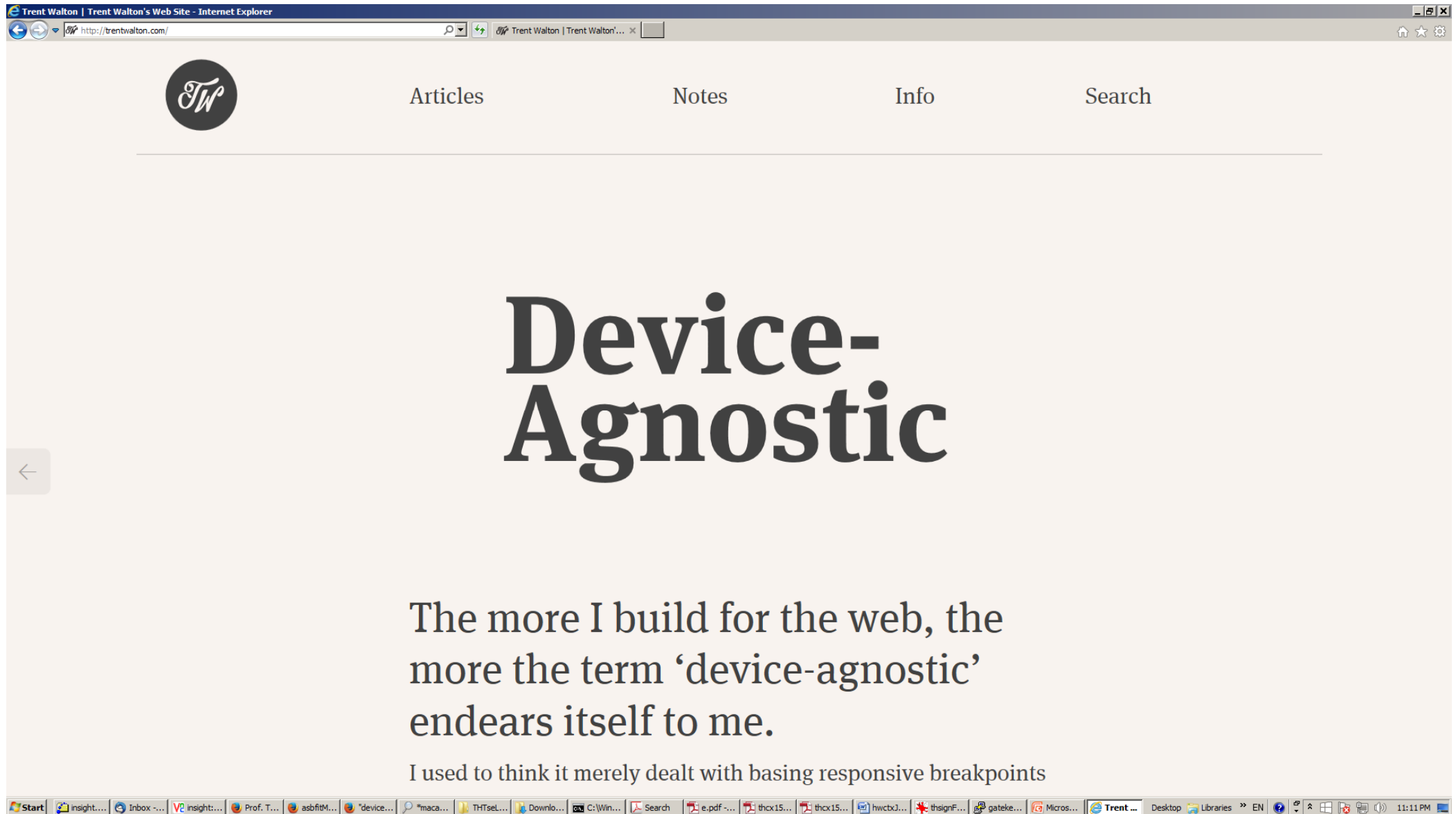
Example 1

(“Show Pictures” Turned Off)



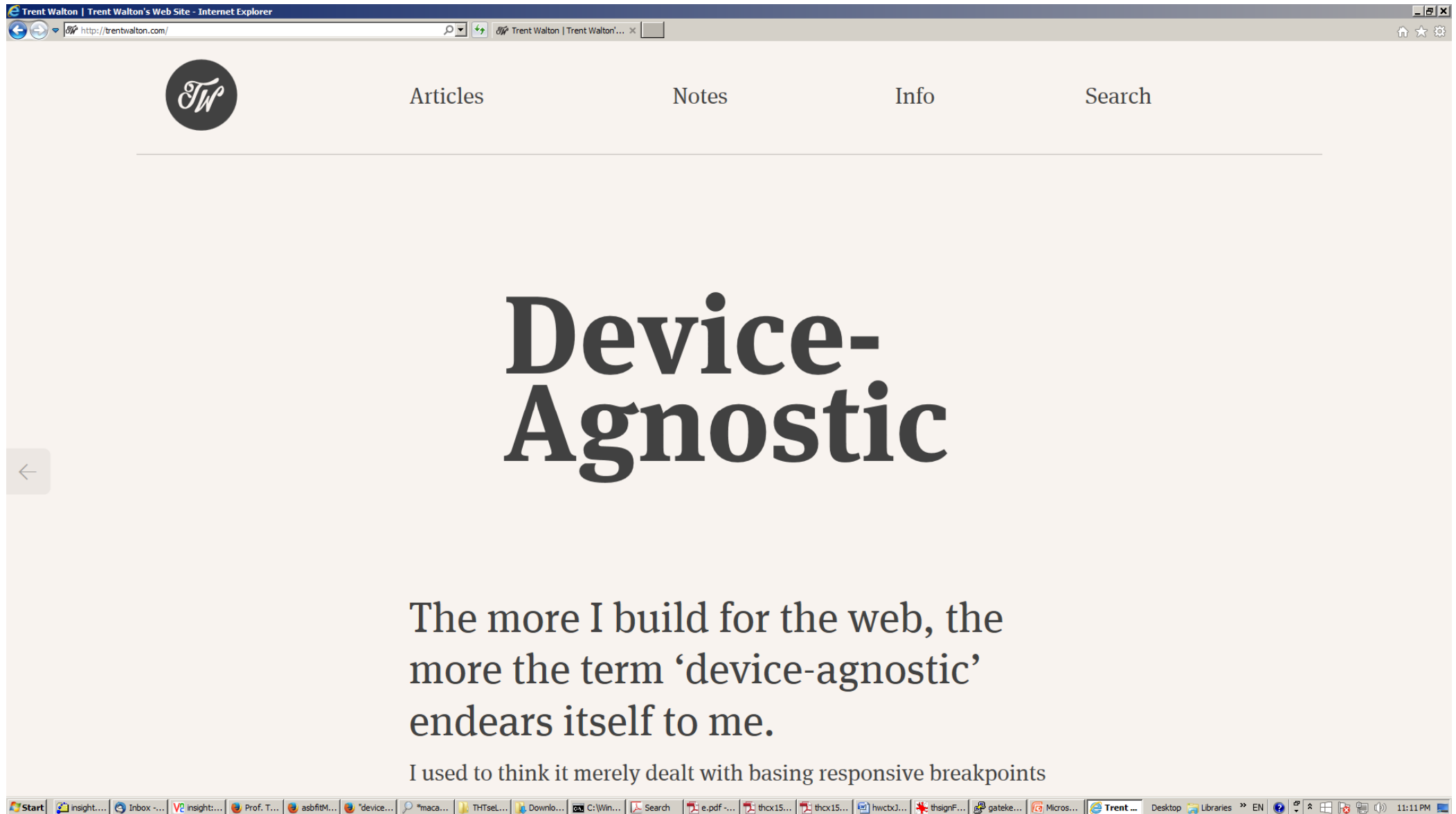
Using HTML to Format the Text

Example 2



Example 2

(“Show Pictures” Turned Off)

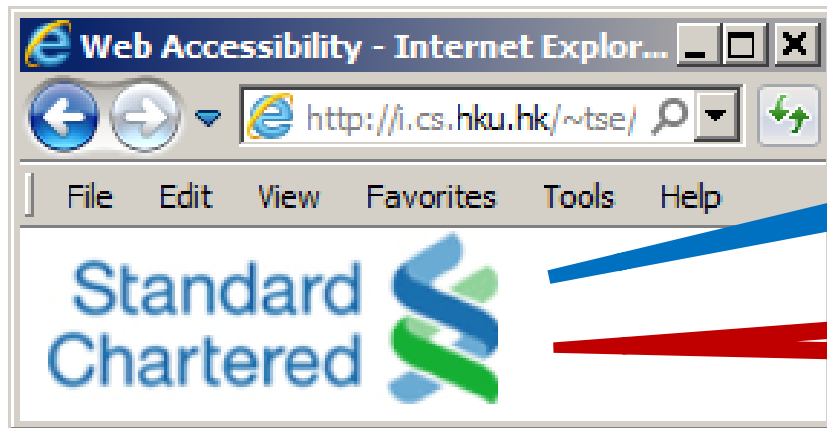


We Learn from Mistakes

Image ``

``

◆ *Example 1*



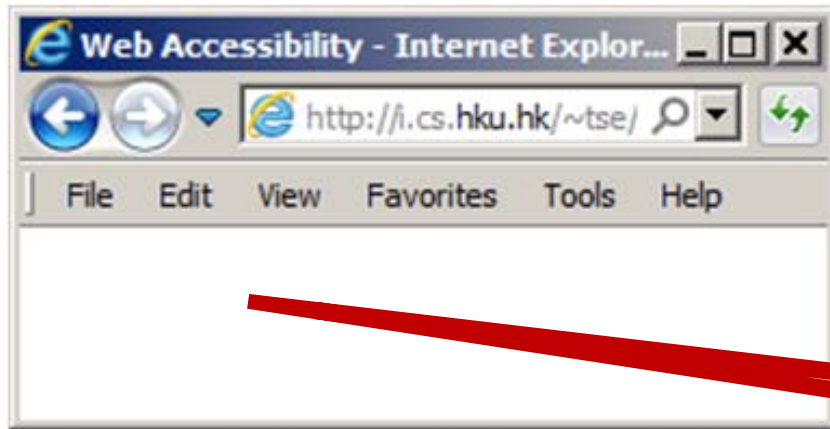
Image

*Not understood
by screen reader.*

We Learn from Mistakes

Image

◆ *Example 1 (“Show Pictures” Turned Off)*



?? .

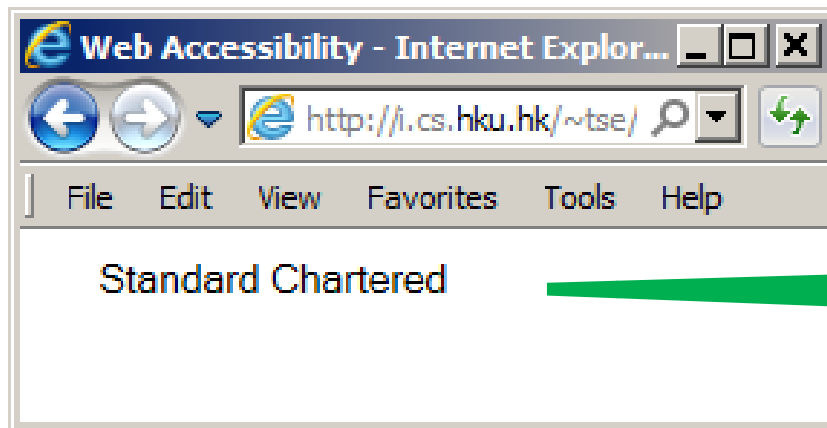
HTML Recommendations

<alt> Text

```
<img src = "chartered.jpg"  
alt = "Standard Chartered">
```

*Recommended
by W3C.*

◆ Example 2 (“Show Pictures” Turned Off)



*Understood by
screen reader*

Cascading Style Sheets (CSS)

- ◆ Separation of content and format
 - Define content using HTML
 - Define format using CSS
- ◆ **Recommended by W3C**
- ◆ *Advantage*
 - Mainstream CSS to define font types, sizes, and colours
 - CSS for screen readers to define voice levels.



Cascading Style Sheets (CSS)

Example 1

◆ *CSS*

```
myHeading {  
    font-family: "Verdana";  
    font-size: 3em;  
    font-weight: bold;  
}
```

◆ *HTML*

```
<font class = myHeading>  
Standard Chartered</font> .
```



CSS Example 2

“Default Style” and “Show Pictures”

Award Presentation Ceremony - HKU - Internet Explorer

http://www4.hku.hk/award/ceremony/

File Edit View Favorites Tools Help


 Award Presentation Ceremony for Excellence in Teaching, Research & Knowledge Exchange

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The University of Hong Kong

About the Ceremony Invitation Award Recipients Programme Venue Location Enquiries



The Award Presentation Ceremony for Excellence in Teaching, Research and Knowledge Exchange 2014 was held on **Monday, March 30, 2015** at **Loke Yew Hall** at **5:00 p.m.**

Share Our Pride

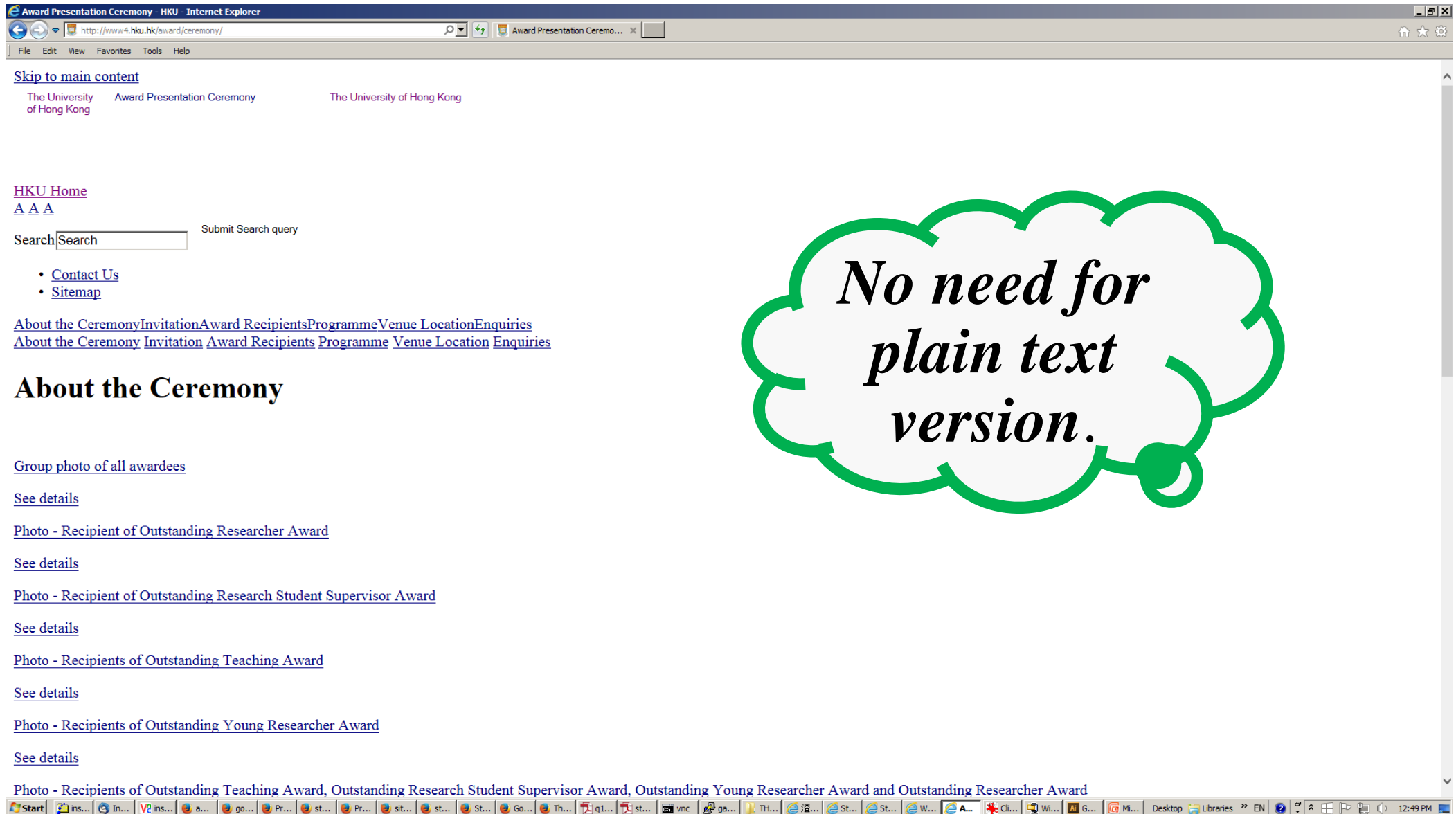
The University of Hong Kong believes that our academics and their talent are priceless assets. Every year, outstanding faculty members are presented with University teaching and research awards for excellence in their fields. Starting from 2012, their outstanding knowledge exchange activities have also been recognised in this event.

The Award Presentation Ceremony is a valuable opportunity for us to meet these exceptional individuals, hear their personal stories, and honour their inspirational achievements. Professor Peter Mathieson, President and Vice-Chancellor, presided at the ceremony and Dr the Honourable Sir

Start Ins... In... V2 Ins... a... go... Pr... st... sit... st... Go... Th... q1... st... vnc ga... TH... 渣... St... St... W... A... Cli... Wi... G... Mi... Desktop Libraries » EN 12:51 PM

CSS Example 2

“Style” and “Show Pictures” Turned off



Generating PDF Files

Method 1 (Print + Scan)

- ◆ Open Microsoft Word document
- ◆ Print
- ◆ Scan the printed hard copy

The most commonly used technique.

Generating PDF Files

Method 1 (Print + Scan)

Disadvantages

- ◆ Cannot search for required text
- ◆ Cannot be enlarged indefinitely
- ◆ Cannot copy and paste the text
- ◆ Hyperlinks do not work
- ◆ Not accessible by screen readers

Advantages

- ◆ ~~Easy to generate?~~
No advantages! .

Generating PDF Files

Method 2 (Save as)

- ◆ Open Microsoft Word document
- ◆ Click “Save As” → “Adobe PDF”.

Generating PDF Files

Method 2 (Save As)

Advantages

- ◆ Can search for required text
- ◆ Can be enlarged indefinitely
- ◆ Can copy and paste the text
- ◆ Hyperlinks work normally
- ◆ Accessible by screen readers

Disadvantages

- ◆ ~~Complex process?~~
No disadvantages! .

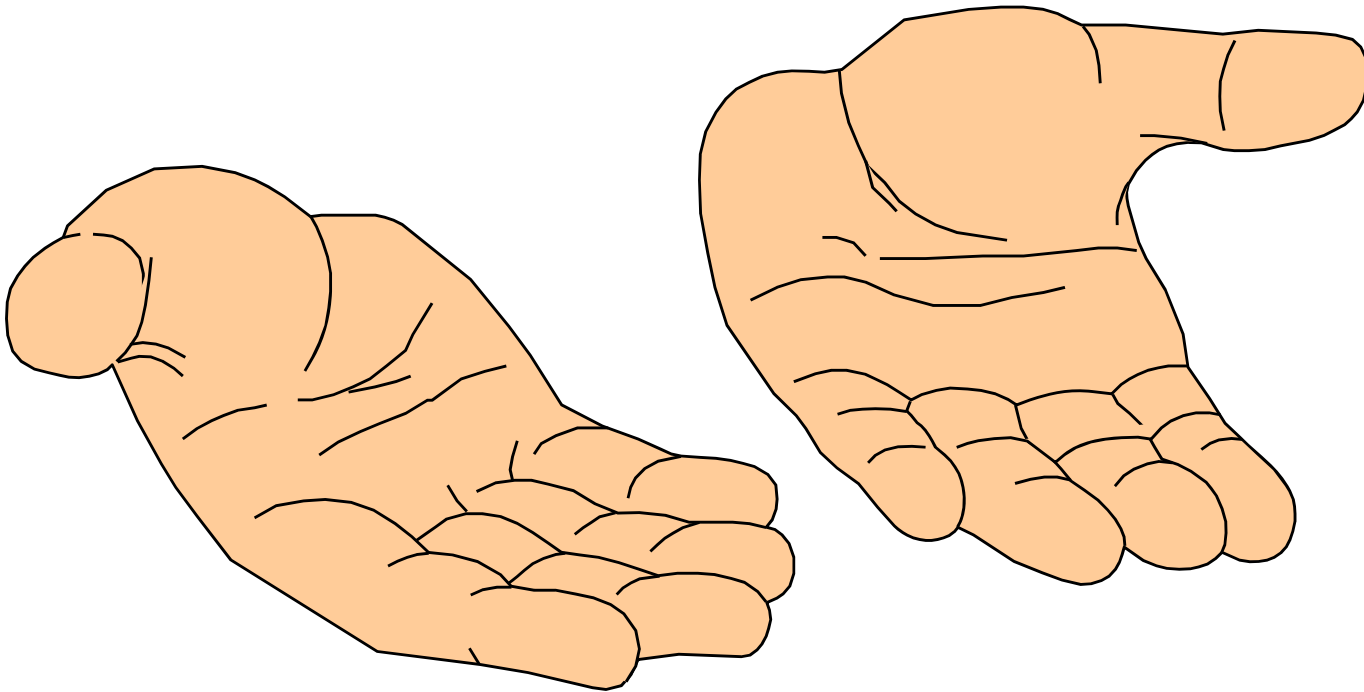
Searchable PDF Files

- ◆ Formal name of accessible PDF files produced by Method 2 (Save As).

Conclusion

- ◆ *Beyond* social responsibility
- ◆ Text rendered by raster or vector graphics *not accessible*
- ◆ *Duplicated effort* for plain text version
- ◆ Turn off “Show pictures” to *test accessibility*
- ◆ Use <alt> text to *explain the graphics*
- ◆ *Separate* content (HTML) and format (CSS)
- ◆ Use “*Save as*” to generate searchable PDF files .

Your Comments are Welcome



Thank you
