

# Web Accessibility Research Directions

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University of Manchester

...Or More Correctly  
**The Human Centred  
Web**

University of Manchester

# Running Order

1. CS at Manchester
2. CS People
3. My Profile
4. My Research Focus
5. Projects
6. Interesting Problems

# Computer Science

- Alan Turing
- Kilburn & Williams
  - \* Baby - Manchester Small-Scale Experimental Machine (SSEM), nicknamed Baby, was the first stored-program computer to run a program -1948
- LeBlanc
  - \* MCC Interim Linux was the first Linux distribution capable of being independently installed on a computer
- Atlas Computer - 1962
  - \* Virtual Memory using paging
- Telecoms
  - \* Manchester encoding - Phase Encoding

# Currently

- Furber
  - \* ARM Processor - AMULET
- Goble
  - \* Grid / Semantic Grid / eScience - TAVERNA
- Horrocks
  - \* DL / Semantic Web - OWL

# IMG / HCWLab

- Information Management Group
  - \* Goble / Paton / Sattler
    - 72 Researchers - 20 / 30 / 22
- Human Centred Web Lab
  - \* Human Factors / Vision / Web / Interfaces
  - \* 8 Researchers
    - SASWAT (full)
    - RIAM (full)
    - ViCRAM (Pilot)
    - SADle (Pilot)

# Profile

- Lecturer / Research Fellow
- ACM SIGWEB EXEC
- ACM ASSETS PC / GC
- ACM HT GC
- W4A Founder
- Web Accessibility: A Foundation for Research
- 50 Peer Reviewed Publications

# My Focus...

- Vision
  - \* Profound Blindness
  - \* Visual Impairment
  - \* Cognition / Perception
  - \* THIS MEANS Content Accessibility
  
- No Altruism
  - \* Difficult
  - \* Interesting
  - \* Exciting

# People are the 'Focus'



# People are 'Cool'

People are THE  
COMPLEX SYSTEM

People are THE  
INTERDISCIPLINARY  
RESEARCH AREA;

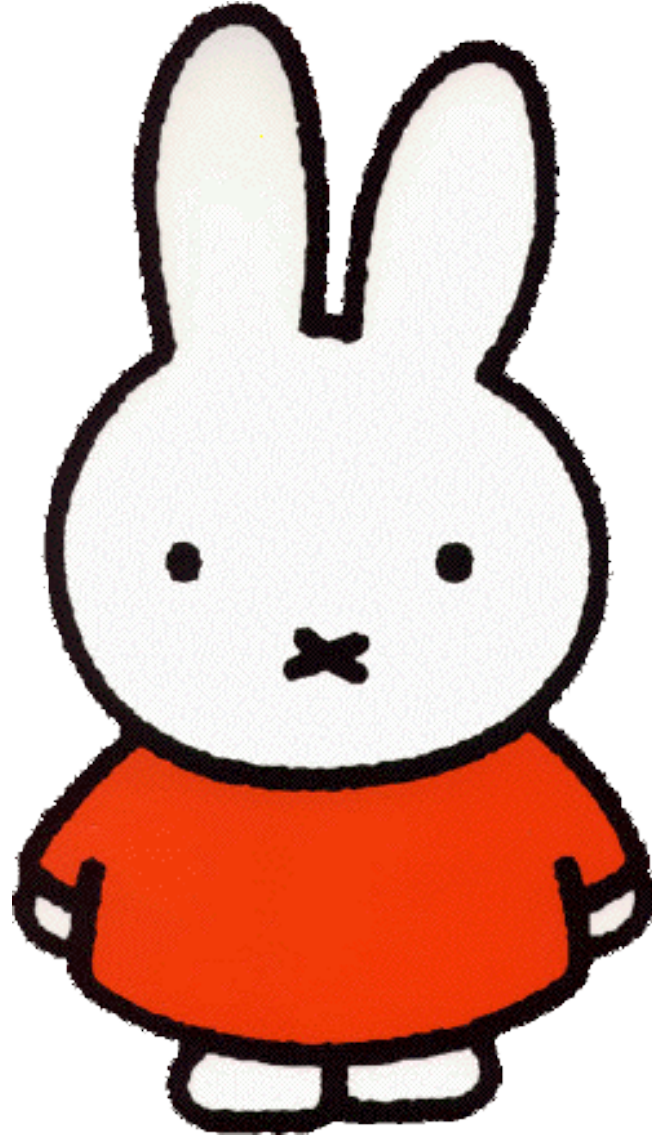


# People are the 'Problem'

- Problematic;
- Difficult to Predict;
- Inconsistent;
- Imperceptible; and
- Implicit.



# Science Not Development



# SASWAT

## Single Structured Accessibility Stream for Web 2.0 Access Technologies

- Funding
  - \* Engineering and Physical Sciences Research Council (EPSRC)
  - \* EP/E062954/1
- Problem
  - \* Independently updating micro contents
- Other Solutions
  - \* AJAX / ARIA
- Our Investigation Remit
  - \* When
    - Are all updates necessary?
    - Are they used?
    - When to present?
  - \* How
    - XMLHttpRequest
    - DOM Changes
    - Network Analysis

# RIAM

## Reciprocal Interoperability of Accessible and Mobile Webs

- Funding
  - \* Engineering and Physical Sciences Research Council (EPSRC)
  - \* EP/E002218/1
- Problem
  - \* Mobile Web making same mistakes as Accessible Web
  - \* Too many rules for validation to be effective
  - \* Too much load on designers for non-desktop sites (CC/PP - DIAL)
- Other Solutions
  - \* None
- Our Investigation Remit
  - \* Can we move accessible Web research to support the Mobile Web?
  - \* Can we understand what and how validation can be supported?
  - \* Can we understand 'device neutral' content without reverting to CC/PP, DIAL, or any of the others.

# ViCRAM

## Visual Complexity Rankings and Accessibility Metrics

- Funding
  - \* University of Manchester
  - \* Pilot
- Problem
  - \* Pages are visually complex
  - \* Complexity deters both sighted and visually impaired users
- Other Solutions
  - \* None
- Our Investigation Remit
  - \* Can we understand visual complexity?
  - \* Is visual complexity an indicator of perceived cognitive complexity?
  - \* Is visual complexity identifiable by programmatic means?
  - \* Can we use it as a way to inform a content transcode?

# SADie

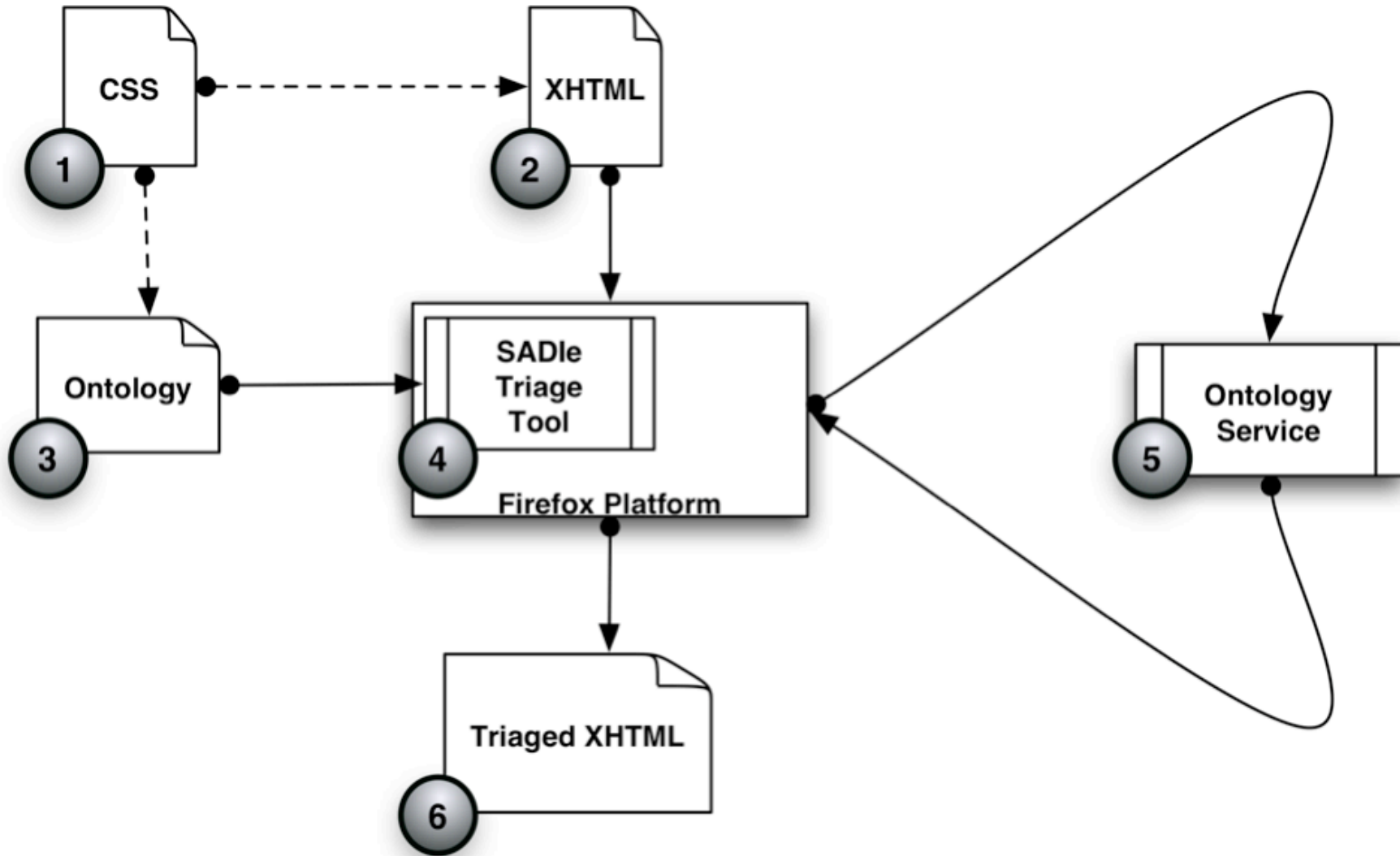
## Structural-Semantics for Accessibility and Device Independence

- Funding
  - \* University of Manchester
  - \* Pilot
- Problem
  - \* Content is built for desktops only and is not flexible
- Other Solutions
  - \* Many - Transcoding invented here at IBM Tokyo
- Our Investigation Remit
  - \* Can we reduce the designers load?
  - \* Can we transcode accurately and scalably?
  - \* Can we do this without content modification or annotation?
  - \* Which transcodes are useful?
  - \* Deeper Transcoding?

# SADle

- Uses Implicit Block Structure of XHTML
- Uses the Visual Presentation of CSS
- The Implicit Semantics of the CSS-XHTML glue
- Uses Ontologies to Reason over the Document Object Model (DOM)

# System



# Concept - End to End



## Labour to overhaul funding system

Labour's ruling body is to take back responsibility for funding in an effort to make it more "transparent".

- Who's who: Labour loans row
- Tories will not name key backers
- Q&A: Cash for peerages row



## Seven 'planned terror campaign'

Seven men accused of planning a terror campaign in Britain go on trial at the Old Bailey.



## Man jailed for Ripper

The man who Yorkshire Ripper investigators v tape is jailed f



## Man jailed for Ripper deception

The man who hoodwinked Yorkshire Ripper murder investigators with a bogus tape is jailed for eight years.

# Structure

```
<div class="mvb">
  <a href="4828828.stm"></a>

  <a href="/4828828.stm" class="sh1">
    Man jailed for Ripper deception
  </a>
  <div class="o">
    The man who hoodwinked Yorkshire Ripper murder investigators
    with a bogus tape is jailed for eight years.
  </div>

</div>
```

# Emergent Semantics

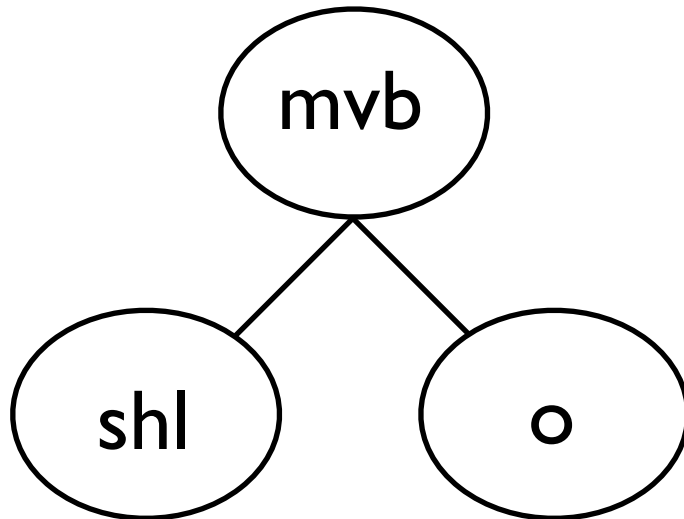
m vb = 'Story'  
s hl = 'title'  
o = 'summary'

# Emergent Semantics

mvb = 'Story'  
shl = 'title'  
o = 'summary'

---

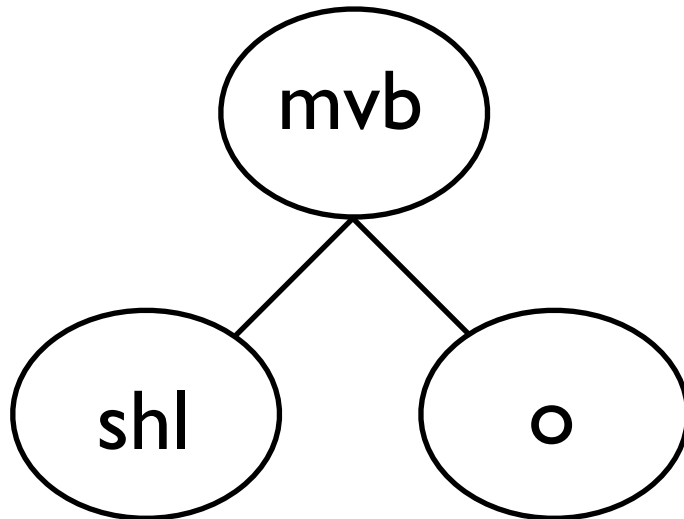
Hierarchy



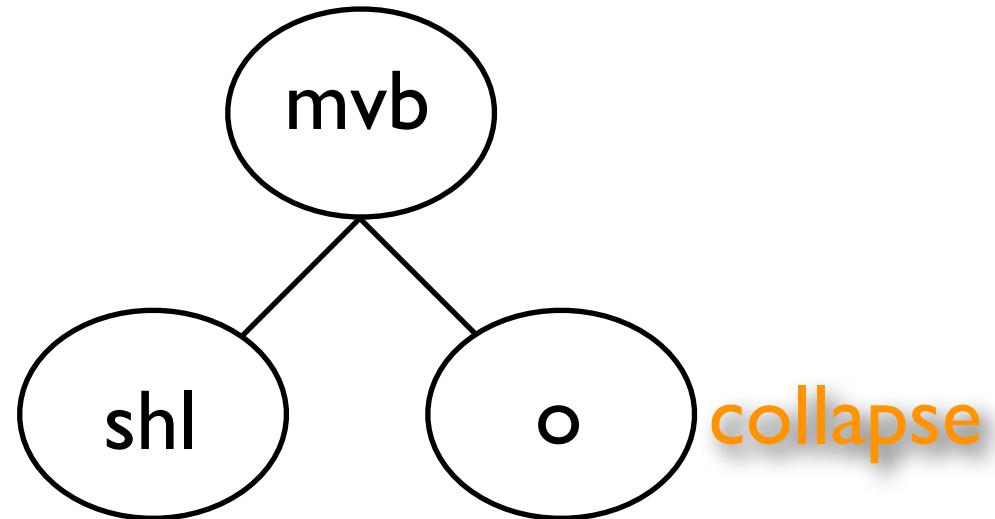
# Emergent Semantics

mvb = 'Story'  
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Hierarchy



Ontology



# You may want...



## **Man jailed for Ripper deception**

The man who hoodwinked Yorkshire Ripper murder investigators with a bogus tape is jailed for eight years.

# You may want...



## Man jailed for Ripper deception

The man who hoodwinked  
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## Man Jailed for Ripper deception +

# You may want...



## Man jailed for Ripper deception

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The man who hoodwinked Yorkshire Ripper murder investigators with a bogus tape is jailed for eight years

# Gives Us...

- No Problems with Transcoding Accuracy
- Concept Checking
- Upper + Site Level Ontology Joining
- Common Interface
- Enables Non Domain Experts
- Generic Tools for Semantic Creation
- Scalability (at the CSS Level)

# SADle Example

New Orleans' streetcars roll again - CNN.com

http://www.cnn.com/2007/US/11/11/katrina.streetcar.ap/index.html

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## New Orleans' streetcars roll again


**STORY HIGHLIGHTS**

- First streetcars roll through New Orleans' Garden District since Hurricane Katrina
- Six miles of St. Charles Avenue line opened on Saturday amid celebration
- Streetcars mean as much to city as Mardi Gras, councilwoman says
- St. Charles Avenue line operated for 170 years before Katrina shut it down

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TEXT SIZE

**NEW ORLEANS, Louisiana (AP)** – Amid a Carnival-like atmosphere, streetcars began rolling past the historic mansions of this city's Garden District Saturday for the first time since Hurricane Katrina halted the St. Charles Avenue line more than two years ago.




A streetcar travels along St. Charles Avenue in New Orleans on Saturday.

While only about half of the line is reopened, many see the return of the 1920s-era green cars as a sign of progress in the city's recovery and a morale booster.

"It's like having another piece of the puzzle, another piece of the city" back, said Melisa Rey, who rode on the first of a string of cars with her husband, Tom, and 10-month-old daughter, Jeanne-Marie. "It's so nice to finally have some good publicity," Tom Rey added.

Six of the 13 miles where the cars once ran are now open on the St. Charles line, and officials hope to restore full service by spring.

It's been slow going in large part due to the cost and scope of the storm's damage to the line's power system, due for an upgrade before the



**RICOH**

OUR VISION!

Loading "http://www.cnn.com/2007/US/11/11/katrina.streetcar.ap/index.html", completed 152 of 155 items

New Orleans' streetcars roll again - CNN.com

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## New Orleans' streetcars roll again

- Story Highlights
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It's been slow going in large part due to the cost and scope of the storm's damage to the line's power system, due for an upgrade before the August 2005 storm. Mark Major, general manager of the New Orleans Regional Transit Authority, praised federal highway officials for providing \$14 million that he said was key to the resumption of the service.

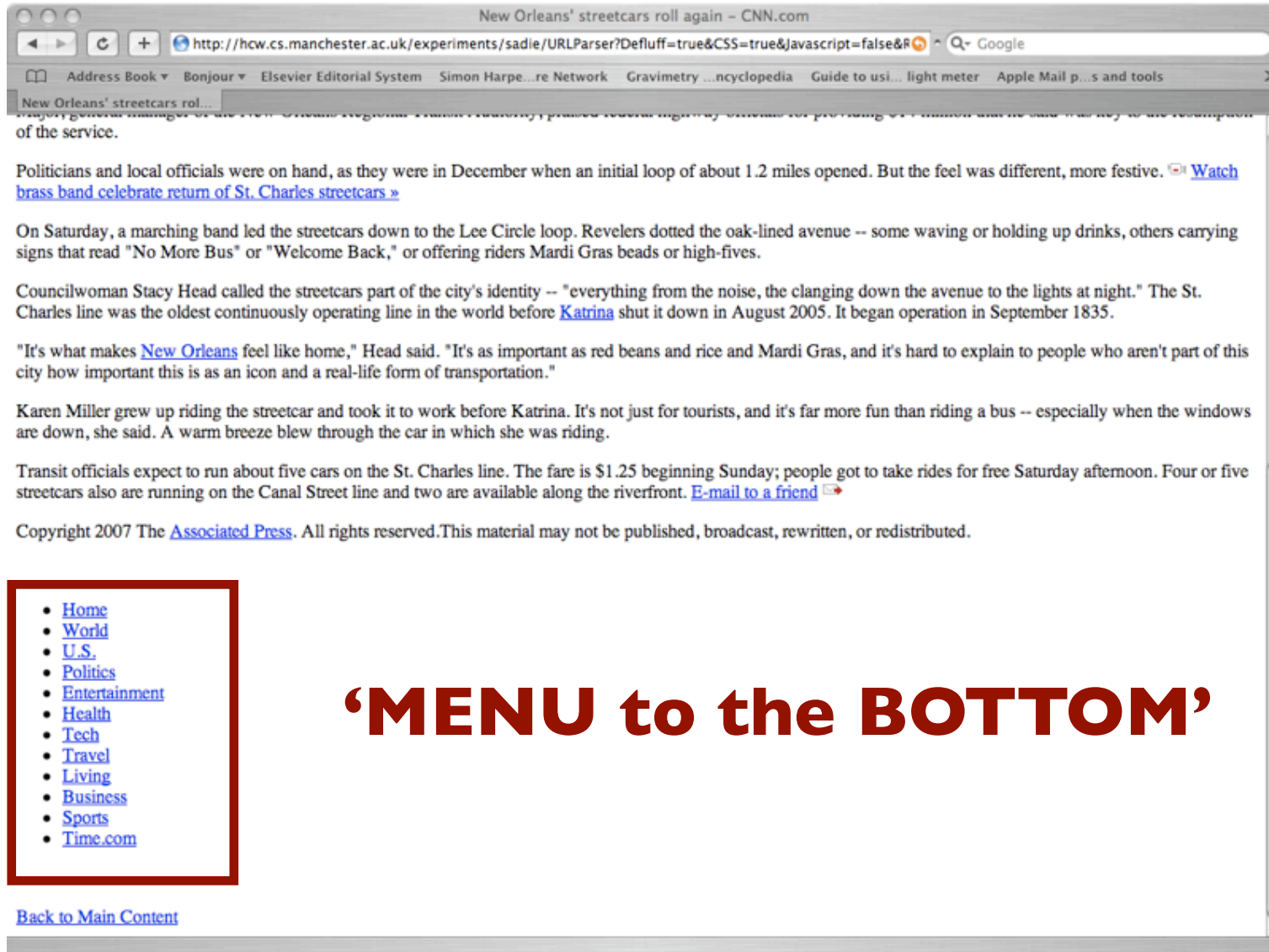
Politicians and local officials were on hand, as they were in December when an initial loop of about 1.2 miles opened. But the feel was different, more festive. [Watch brass band celebrate return of St. Charles streetcars »](#)

On Saturday, a marching band led the streetcars down to the Lee Circle loop. Revelers dotted the oak-lined avenue -- some waving or holding up drinks, others carrying signs that read "No More Bus" or "Welcome Back," or offering riders Mardi Gras beads or high-fives.

Councilwoman Stacy Head called the streetcars part of the city's identity -- "everything from the noise, the clanging down the avenue to the lights at night." The St. Charles line was the oldest continuously operating line in the world before [Katrina](#) shut it down in August 2005. It began operation in September 1835.

"It's what makes [New Orleans](#) feel like home," Head said. "It's as important as red beans and rice and Mardi Gras, and it's hard to explain to people who aren't part of this

# Menu?



**‘MENU to the BOTTOM’**

# Live Demo

[http://hgw.cs.manchester.ac.uk/  
experiments/sadie/Transcoder](http://hgw.cs.manchester.ac.uk/experiments/sadie/Transcoder)

# New Work

- Web 2.0 and Older People
- Coping Strategies
- Thinking about Mathematics
- User Simulation and Prediction

ありがとうございました！

しつもんありますか？

[http://  
hcw.cs.manchester.ac.uk](http://hcw.cs.manchester.ac.uk)