# Adaptation to Large Screens: A Case for Model-based User Interfaces?!

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W3C Workshop on Future Standards of MBUI

Critique of State-of-the-Art in Web Engineering

- MDWE approaches (WebML, HERA, UWE, etc.)
    - evolution of the web caused two waves of major model extensions
        - support for context-awareness
        - integration of RIA concepts
    - still document-oriented and page-based
    - changes in the model often require complete regeneration of web application
    - rather limited tool support
    - multi-channel support often results in unmanageable complexity

- Web application and RIA frameworks (GWT, JavaFX, etc.)
    - often no systematic approach
    - no notion of context and limited (if any) concepts for adaptivity

Multi-channel Content Delivery
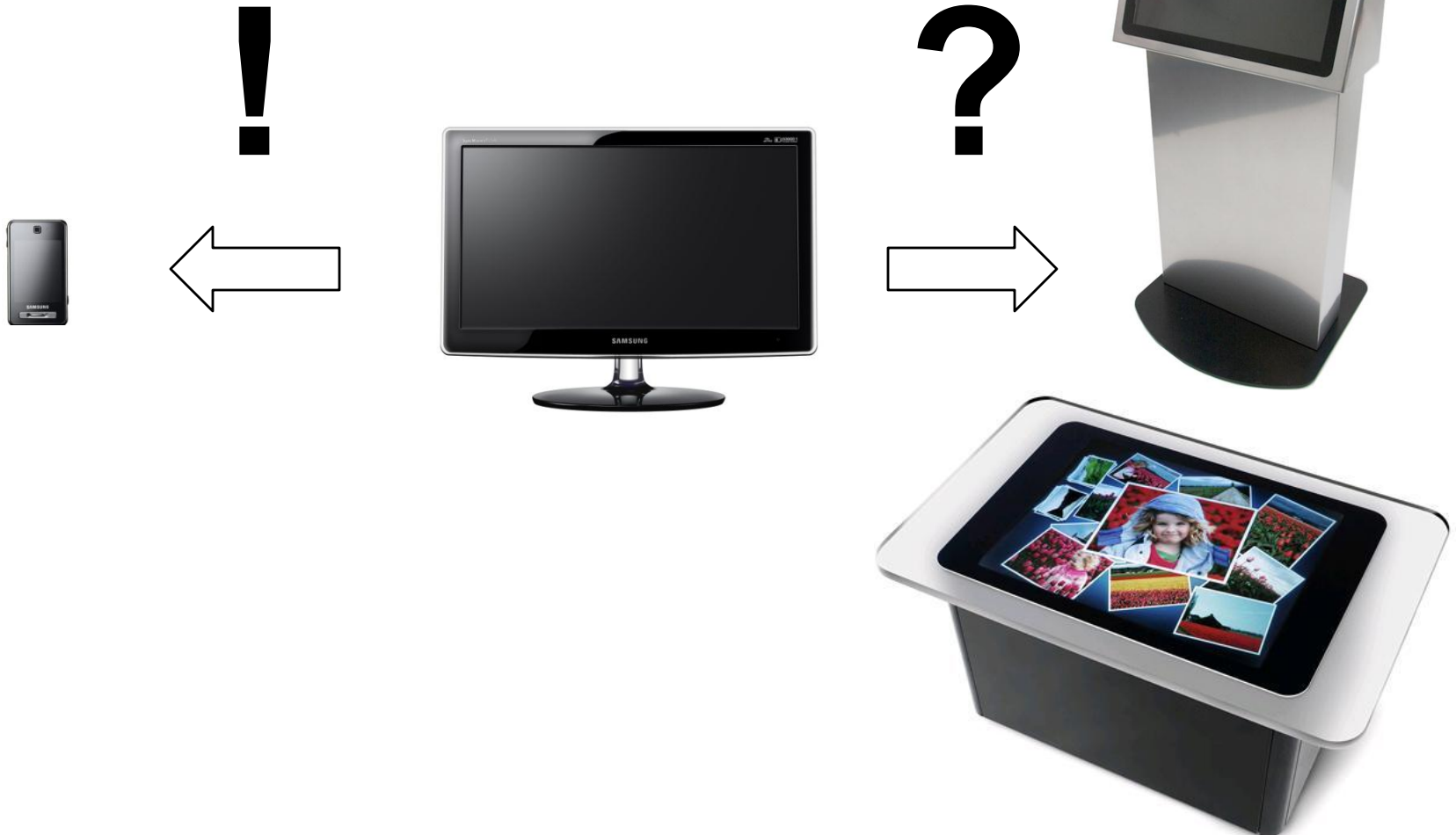
Problem Scenario: Adaptation to Larger Screens
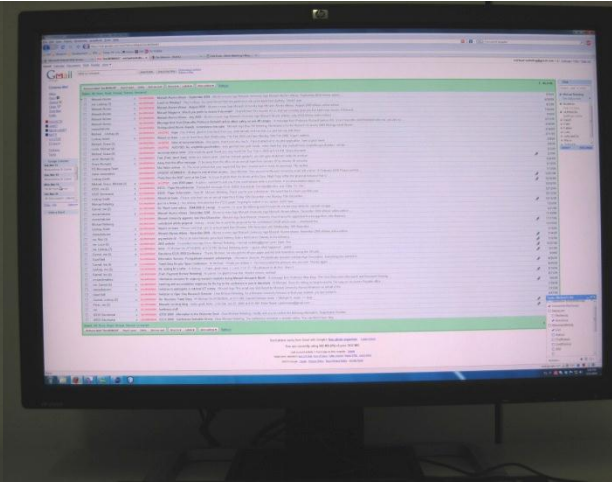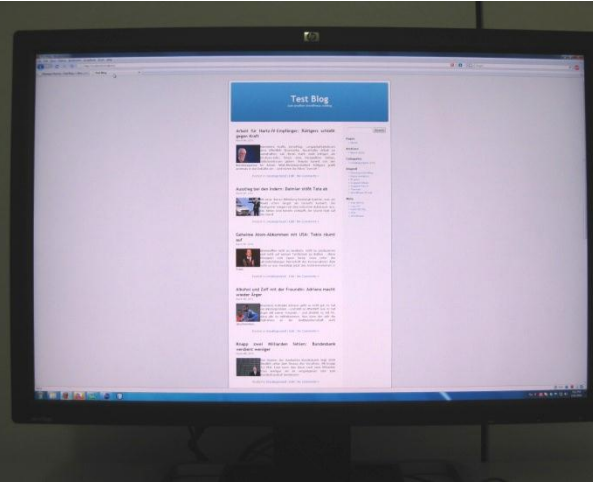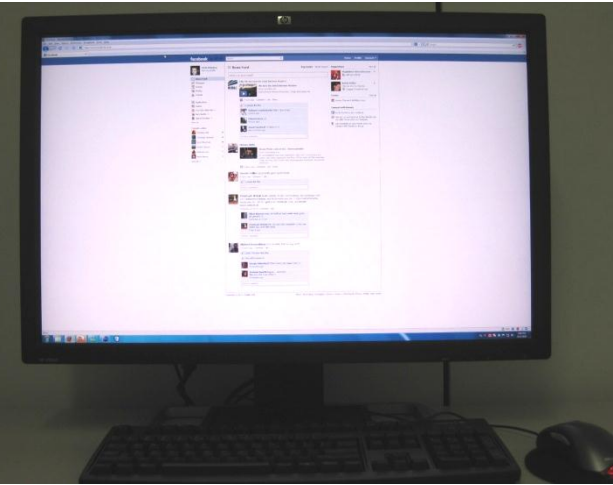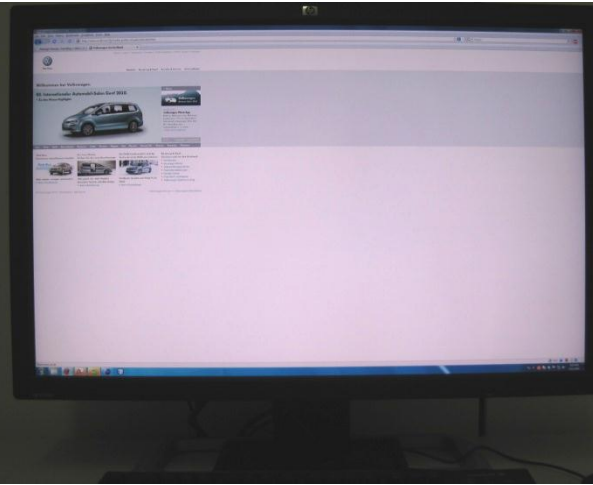
Current Design Issues of Most Web Pages

- Spatial distribution of content elements
  - mostly static layouts with only limited variability
  - media often loses high proportions of the visible area on first screen
  - amount of visible links often increases substantially at larger viewing sizes

- Text and font characteristics
  - font weight and size, number of columns and column widths, line spacing often optimised for 1024x768
  - typically hard-coded

- Media resources
  - often available only in one size
  - typically embedded with fixed dimensions

Recent Work on Quality of UI Adaptations

Required Forms of Context-aware Adaptation

- Content
  - adaptation of web sites must start with adaptation of content
  - varying screen size calls for different versions of text and images
    - e.g. to show only the relevant parts on small screens
    - e.g. to show longer text versions or media with much higher level of detail on large displays

- Navigation
  - adaptation of content will need to reflect in overall website structure
  - scrolling and attention principles (Jakob Nielsen)
    - scrolling beats paging
    - what is truly important should remain above the fold
    - information foraging theory

Required Forms of Context-aware Adaptation (2)

- Presentation
  - selection of appropriate content elements (possibly versioned in different sizes)
  - effective spatial distribution in the viewport and
  - the style treatment including appropriate font characteristics to support on-screen readability

"Although long-standing research exists on grid-based or constraint-based layouts, the specification of rules using native web technologies is still very limited even in the latest versions with HTML5 and CSS3."

  - current workarounds used by web developers
    - specify adaptive layouts with the help of libraries such as jQuery Masonry using JavaScript and CSS
    - wait until the W3C's proposal to include multi-column layout in CSS3 is adopted and implemented in all major web browsers

For MBUI to be applicable, I think we need…

- Conceptual approaches that interface with existing solutions at the technological level

- Component-based models that cater for the plug-and-play style and rich interactions in modern web user interfaces

- Integrated support for design and run-time adaptivity based on first-class context-aware concepts

- Rich tools that demonstrate feasibility even in complex scenarios such as the adaptation to large screens