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*The impact of change in Web-based  
IR systems on users' experience*

**Dr. Sanda Erdelez**  
**School of Information Science and Learning  
Technologies**  
**University of Missouri - Columbia, USA**  
sanda@missouri.edu

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***Everything changes,  
nothing remains.  
You can't step into  
the same river  
twice.***

**Heraclitus**



# Concept of Change

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State  $x_1$   
(initial)

State  $x_2$   
(changed)



TIME

# Change is inevitable

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- Users change
- IR systems change
- Environment in which users and IR systems operate changes

## Users Change

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- They change from novice to experienced IR system users
- Their subject expertise changes
- Their information needs and information problems change

## IR Systems Change

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- Their search capabilities change
- Their content changes
- Their user interface changes

# Environment Changes

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- Technological advancements in system design and development (e.g., object oriented programming, rapid prototyping)
- Changes in connectivity, mobility, transportability, interoperability

# Impact of Change

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- Positive outcomes for the user - usually delayed:
  - Better system usability
  - Improved productivity
- Negative outcomes for the user - usually immediate:
  - Confusion
  - Decreased productivity
  - Frustration



## Why IR Systems Change?

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- Technological advances
- Growth in content
- Change in system purpose
- Improvements in design and capabilities

## Change in Web-based IR systems: Examples

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- A website doesn't exist any more
- A linked document is not there any more
- A website has a different look and feel
- A new search feature/function has been added

# Two Case Studies of Change

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## Dell Computer:

- 10 mil. Visitors per month (1999)
- “Dell reworks Web site to guide 'solvers,' 'browsers' ” 11/15/99
- Customer support Website redesign by internal Web development group
- Third major Website redesign since 1996
- redesign revoked due to massive complaints

## Two Case Studies of Change

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### Liz Claiborne:

- Online store redesign by Creative Good (<http://www.creativegood.com/>)
- The redesigned site reportedly created 57% increase in sales conversion and a 25% increase in average order size

## Implications for Web Users

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- What you have once found will not be there when you visit again
- Need to have universal search skills
- Need to have alternative strategies for finding information when system changes

## Implication for Web Designers and Content Providers

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- Web users notice and care about the changes
- Keep in mind unintended effects of changes
- Think about ripple effect of changes

## Research Implications

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Need to incorporate change as a factor in the research design for IR system evaluation

- User change: *information problem shift* (Spink & Wilson, 1999)
- System change: ???
- Need to conduct studies about the impact of IR system change on user experience.

# Possible Research Approaches

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- Experimental studies
- Longitudinal studies
- Dynamic system modeling of potential impacts of change



## Heraclitus, again...

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- It is the change of water that makes a river.
- It is the change of Web-based IR systems that makes the Web.