

Introduction to information architecture

I. What is information architecture?

- Origins of IA



II. Evolution of IA

- Third generation IA
- IA in organizations

III. Basic concepts and principles

- Organization and order
- Hypertext
- Navigation and labeling



I. What is information architecture?

A brief history of information architecture

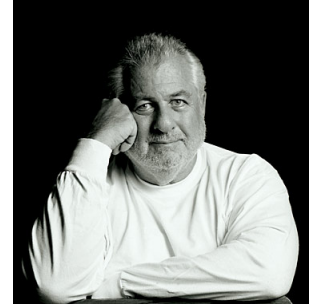
Resmini and Rosatiu provide a brief history and overview of IA and discuss its significance for our field

IA has gone through at least three stages and is entering a fourth

While IA has been linked closely to the web, changes in technology are driving IA in new directions

~ What changed when the focus of IA shifted from information design to information systems?

~ How does the work of the IA change in pervasive IA?



I. What is information architecture?

Origin: Richard Wurman introduced IA in 1975, thinking about the role of information urban planning and design

Used an architectural metaphor to describe the need to transform data into meaningful information for people to use

Information as instructions for organizing space

It involves the creation of systemic, structural, and orderly principles to make something work

The thoughtful making of either artifact, idea, or policy that informs because it is clear

I. What is information architecture?

From a speech in 1976; an “information architect is:

- 1) the individual who organizes the patterns inherent in data, making the complex clear**
- 2) a person who creates the structure or map of information which allows others to find their personal paths to knowledge**
- 3) the emerging 21st century professional occupation addressing the needs of the age focused upon clarity, human understanding, and the science of the organization of information.”**

Wuhrman, R.S. and Bradford, P. (eds). (1996). Information Architects. Zurich, Switzerland: Gaphis Press.



I. What is information architecture?

“...while some folks adhered to the Wurman definition, we became evangelists of the LIS ... school of information architecture. We argued passionately for the value of applying traditional LIS skills in the design of websites and intranets. We hired ‘information architects’ and taught them to practice the craft.

We embraced other disciplines, integrating user research and usability engineering into our process. And, along the way, we built one of the world’s most admired information architecture firms.”

Morville, P. (2004). A brief history of information architecture. In Gilchrist, A. and Mahon, B. Information Architecture: Designing information environments for purpose.

<http://semanticstudios.com/publications/historia.pdf>

I. What is information architecture?

IA has become more significant as an activity and a profession since 2000

ASIST sponsored the first IA conference in 2000 and it has become a prime meeting place for IAs

The Asimolar Institute for Information Architecture (AlfIA) was formed in 2003

There is no credentialing, but there are IA grad programs

Kent State has an IA masters, we have a post-masters certificate program

Professionals come from LIS, HCI, web design, technical writing

I. What is information architecture?

What is IA?

The combination of organization, labeling, and navigation schemes within an information system

The structural design of an information space to facilitate task completion and intuitive access to content

The art and science of structuring and classifying web sites to help people find and manage information

An emerging discipline and community of practice focusing on bringing principles of design and architecture to the digital landscape



I. What is information architecture?

Dillon and Turnbull's definition

IA is the term used to describe the process of designing, implementing, and evaluating information spaces that are humanly and socially acceptable to their intended stakeholders

They argue that it is a craft

IA creates as it produces, reacting to emerging elements of its own design to drive subsequent modifications

How can the field achieve and maintain professional status?

Dillon, A. and Turnbull, D. (2005). Information architecture. Encyclopedia of Library and Information Science.

I. What is information architecture?

Big IA: the process of designing and building information resources that are useful, usable, and acceptable

Covers user experience and organizational acceptance of the resource

Top down: treats the full product and its human or organizational impacts

Little IA: a more constrained activity designing metadata and controlled vocabulary of information organization

Not involved in analyzing the user response or the graphical design of the information space

Bottom up: does not deal directly with or evaluating formally the user experience of the resulting space

I. What is information architecture?

IA practice

Understanding the information as content and shaping its organization and access

Building abstract associations between units of content

Developing browsing and searching functionality

Designing the graphics, interfaces, and interaction techniques to allow users to access the body of information

IA: the complete process of design with specific methodologies for managing deployment of resources and sequencing of deliverables

I. What is information architecture?

IA research

The study of navigation and how people find what they are looking for in an information space

The perception of information shape or the emergence of web genres and their exploitation for design

The interaction between various structural forms of information space and the user

Search behavior and the design of efficient search mechanisms

IA should have a future: a world of digital information will need people to architect spaces to share, collect, and organize documents and resources

I. What is information architecture?

Use of the architectural metaphor

Architecture shapes experience (easy to understand with physical spaces)

Information spaces can be designed using architectural principles

They are constructed to provoke a reaction, to allow you to carry out tasks, and help you get a job done

To entertain you

To help you learn...

Where does this metaphor break down?

Introduction to information architecture

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- **Origins of IA**

II. Evolution of IA

- **Third generation IA**
- **IA in organizations**

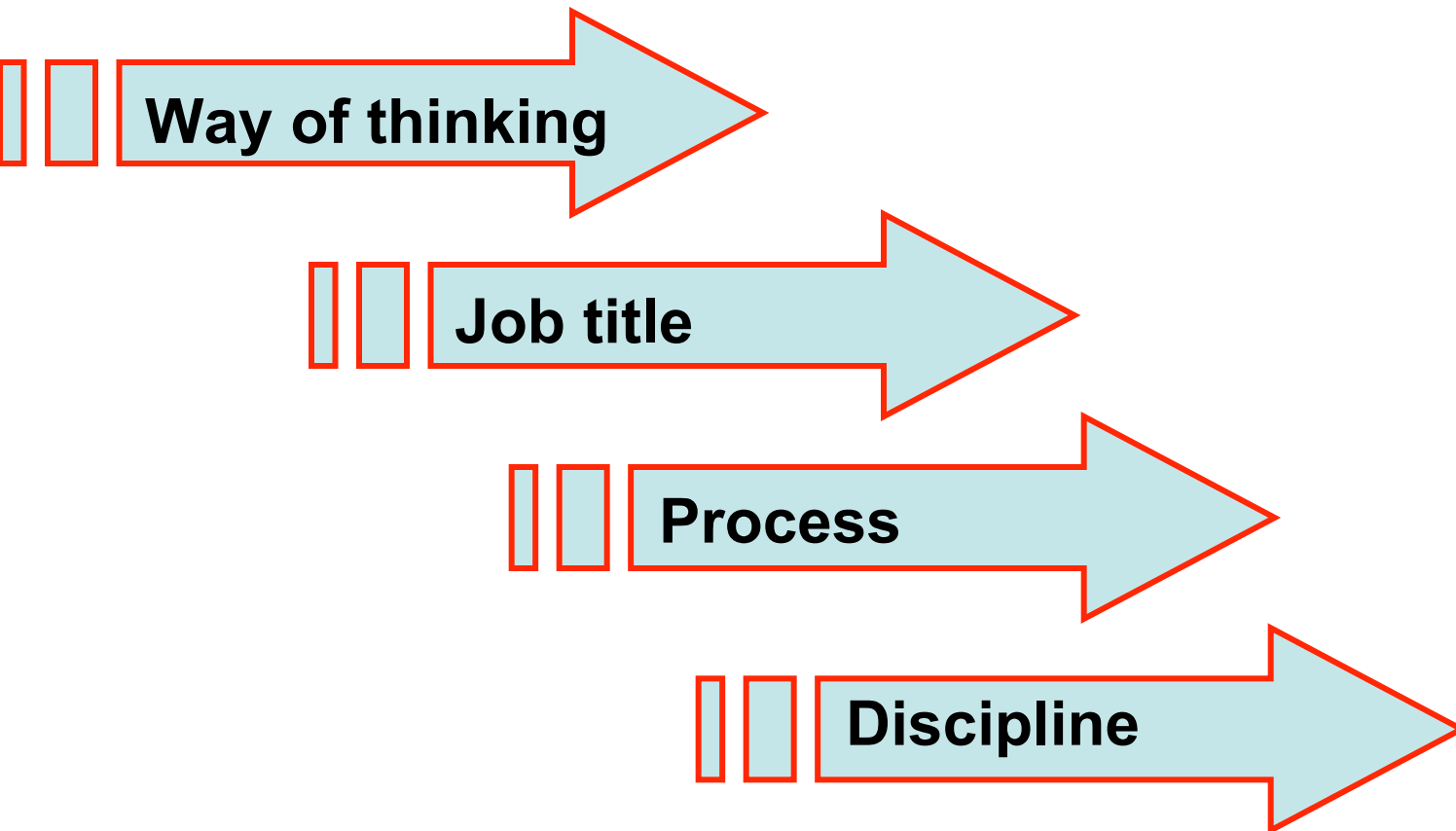


III. Basic concepts and principles

- **Organization and order**
- **Hypertext**
- **Navigation and labeling**

II. Evolution of IA

Information architecture is a





II. Evolution of IA

IA is a way of thinking about information and information design

It involves information organization, design, display and access

It is a solution to a communication problem

It is a collective process used in projects where the goal is to develop a “container” for information

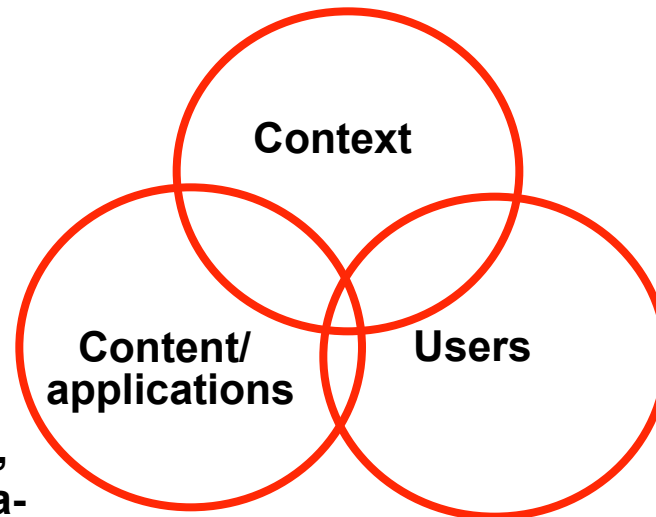
IAs design organization and navigation systems to help people find and manage information more successfully

This process necessarily involves working with people in a variety of related specialties

II. Evolution of IA

Rosenfeld's visual representation of IA

**Business models and
goals, politics, culture,
resources**



**Document types, objects,
structure, attributes, meta-
information**

**Information needs, audience
types, expertise, tasks,
ecology**

www.asis.org/Conferences/Summit2000/rosenfeld/sld007.htm

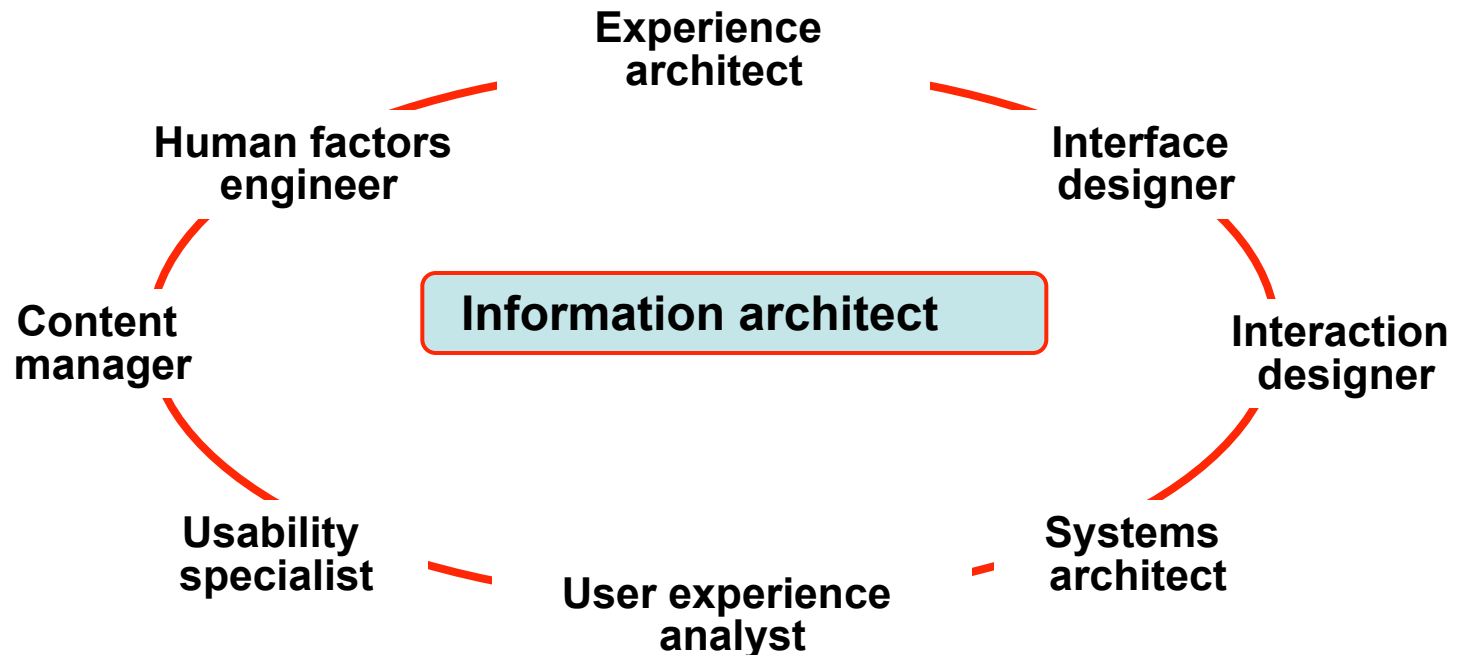


II. Evolution of IA

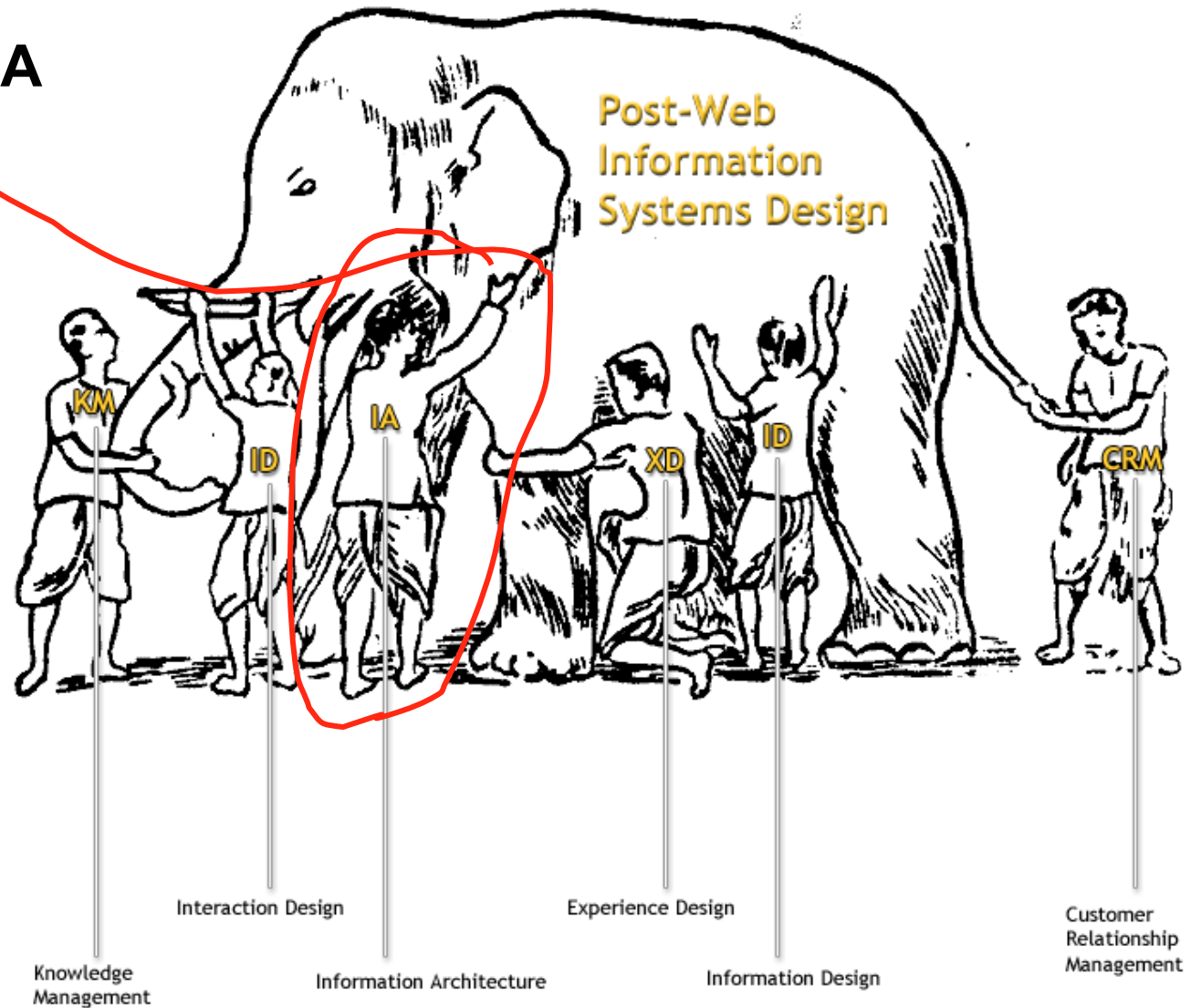
It is a job title

It is typically associated with web site development

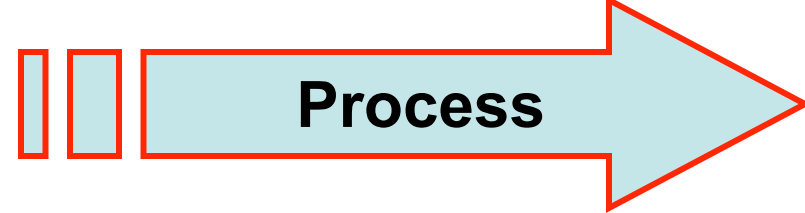
There is some controversy over the relationship of IA to other positions involved in information design



II. Evolution of IA



www.louisrosenfeld.com/home/bloug_archive/images/011014elephant.gif



II. Evolution of IA

Should IA be a role or a process?

Dillon and Turnbull: IA is better served by focusing on the skills, theories, methods, and practices that shape digital design

“Proper ... site design is largely a matter of balancing the structure and relationship of menu or ‘home’ pages and individual content pages or other linked graphics and documents. The goal is to build a hierarchy of menus and pages that feels natural and well-structured to the user, and doesn’t interfere with their use of the ... site or mislead them.”



II. Evolution of IA

It is a discipline

IA addresses the design of effective and efficient information systems and structures that provide access to collections of information resources

It involves planning, overseeing implementation, and managing the growth of organizational structures

Goal: to provide meaningful context in support of user understanding

To mediate interaction between system content and structures such as DLs, web sites, DBs, IR systems...

ILS@IU

www.ils.indiana.edu/degrees/arch.php



II. Evolution of IA

Complexity and the practice of web information architecture

Burford uses a grounded theory approach to argue that web IA in organizations is a complex adaptive system

She studies web work in seven organizations to provide empirical examples of actual practices of information organization and find that the work is deeply contextual and characterized by compromise and negotiation

~ If Burford correct in her findings, what happens to the possibility of best practices for IA?

~ If you were a corporate IA, how would the Cynefin framework affect your work?

II. Evolution of IA

A website will have an information structures regardless of whether an organization consciously implements a process for web IA

The ability of website users to find information is paramount and enabled by attention to information design

Effective online information structures are a vital organizational asset and source of competitive advantage

Rosenfeld and Morville offer a systematic evolving structured methodology for the practice of web IA

Burford, S. (2011). Complexity and the practice of web information architecture. Journal of the American Society for Information Science and Technology, 62(10), 2024-2037.

II. Evolution of IA

The web's growth and development and the ease of participation in website publishing by multiple organizational stakeholders introduce challenges

A website serves multiple audiences leading to goal conflict between organizational subunits with different target customers

IA practices vary greatly across organizations

Web IAs require a broad set of skills and expertise: research, design, evaluation, coordinating stakeholders, and project management

Issue: how to structure information in a new information environment without established traditions and practices

II. Evolution of IA

Debate: can there be systematic approaches with best practices to the design of online information spaces?

Rosenfeld and Morville offer a systematic evolving structured methodology for the practice of web IA

U.S. Department of Health and Human Services has published a set of web development guidelines

But Spool and Nielsen claim that a website's deep information structures require contextual, dedicated, and creative information design activity that cannot be standardized in the form of guidelines

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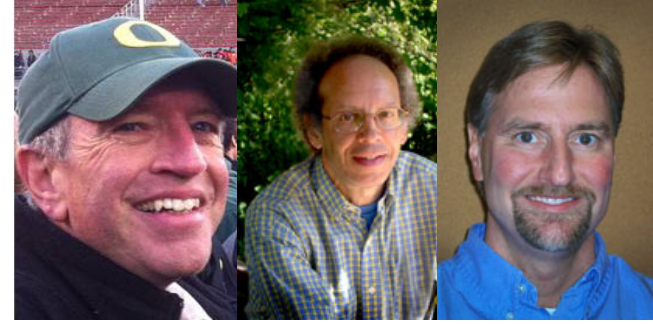
II. Evolution of IA

- **Third generation IA**
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III. Basic concepts and principles

- **Organization and order**
- **Hypertext**
- **Navigation and labeling**





III. Basic concepts and principles

The information architecture of behavior change websites

Danaher et al. explore the uses of web sites by medical professionals to promote changes in behaviors

They argue that different IA schemes produce different results when presenting behavior change strategies developed in office or clinical settings on the web

~Is it possible for a web site and its contents to be a stimuli for behavioral change? Why?

~Should IAs develop different types of site structures for different types of behavior change?

III. Basic concepts and principles

They take a pragmatic approach to IA

How can the web be used to deliver effective behavior change programs?

They argue that IA is a critical component, especially the structure of the web site

Assume: different site designs can be matched with different behavior change goals

IA plays a role in web-based behavioral interventions

Research question: how much change is due to the strategies and how much to the site IA?

Danaher, B.G., McKay, H.G. and Seeley, J.R. (2005). The information architecture of behavior change websites. *Journal of Medical Internet Research* 7(2).

III. Basic concepts and principles

Structures that make a difference in behavioral change

The free-form matrix design that offers little information structure

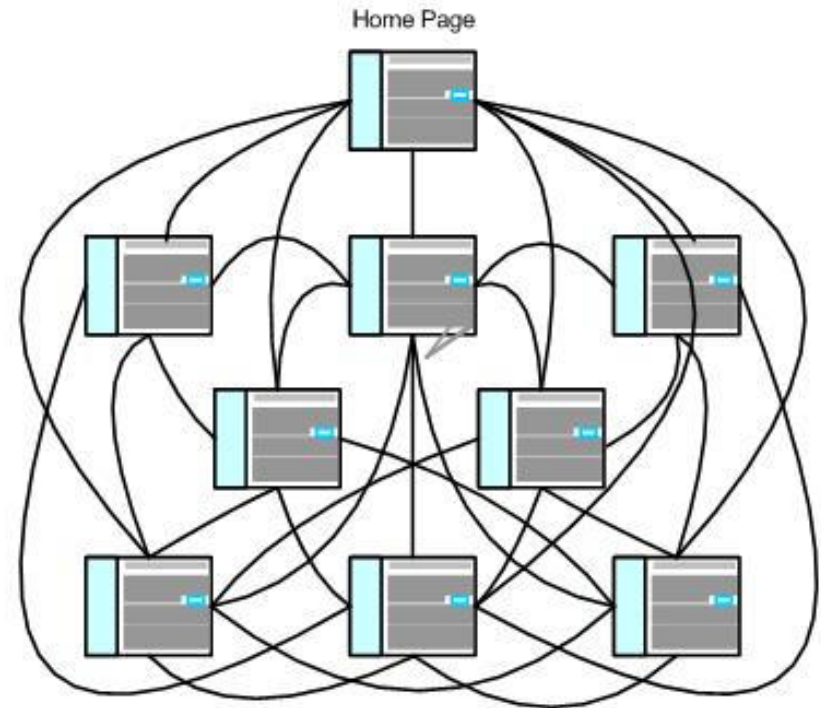
Most pages are linked to each other

Maximum content

Freedom of movement but at the cost of getting lost

Good for small sites and experienced users

J Med Internet Res. 2005 Apr-Jun; 7(2): e12.



III. Basic concepts and principles

Structures that make a difference in behavioral change

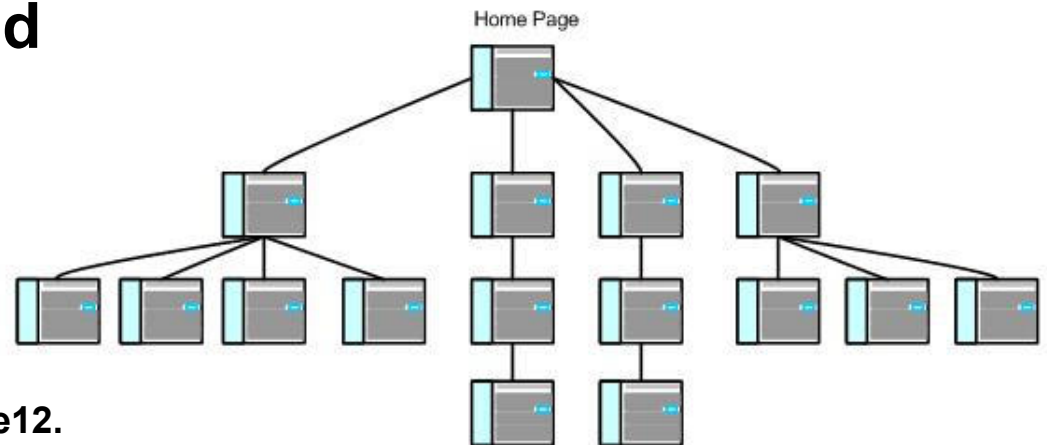
A hierarchical design that provides the user with information arranged in an organized fashion

Top down allowing review of increasingly detailed content

Information is chunked

Effective searching through drilling down

Reduces confusion



J Med Internet Res. 2005 Apr-Jun; 7(2): e12.

III. Basic concepts and principles

Structures that make a difference in behavioral change

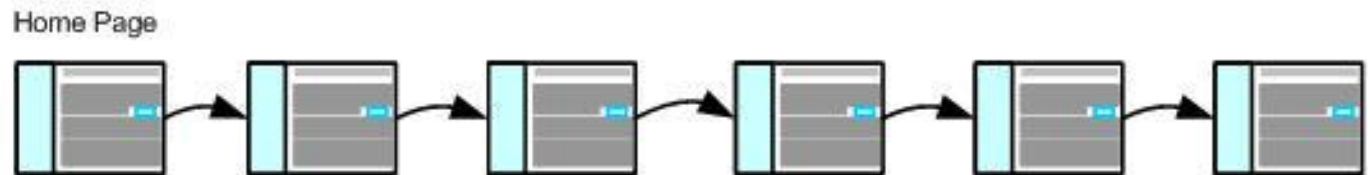
A tunnel design that defines a narrow path with a predefined series of steps

Designer attempts to control user interaction

Good for accomplishing tasks (buying, booking)

May be good for learning

May reduce anxiety and encourage dialog



III. Basic concepts and principles

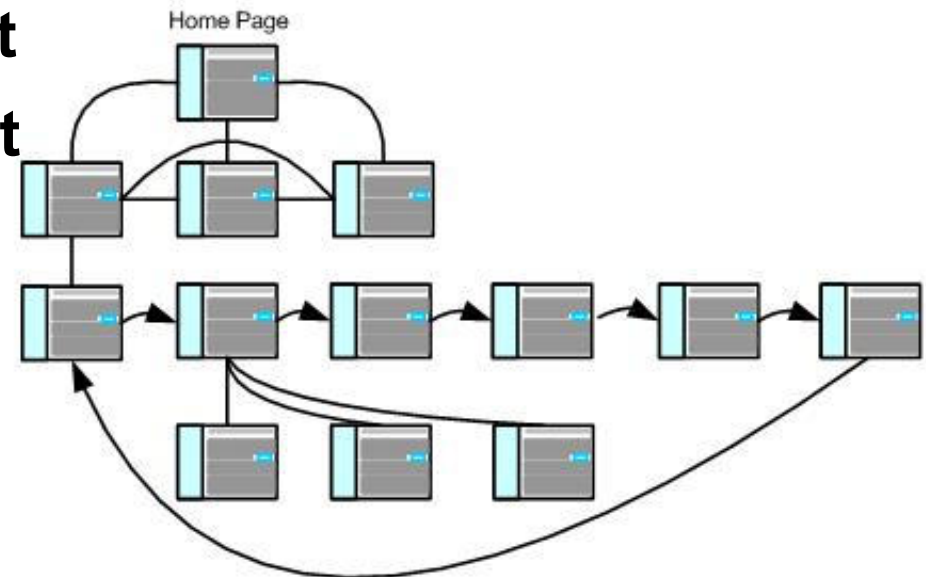
Structures that make a difference in behavioral change

A hybrid design composed of a combination of modules that have their own IA design

Allows exploration of content (engage in discovery learning) while maintaining focused forward movement

More freedom of movement with more constrained options

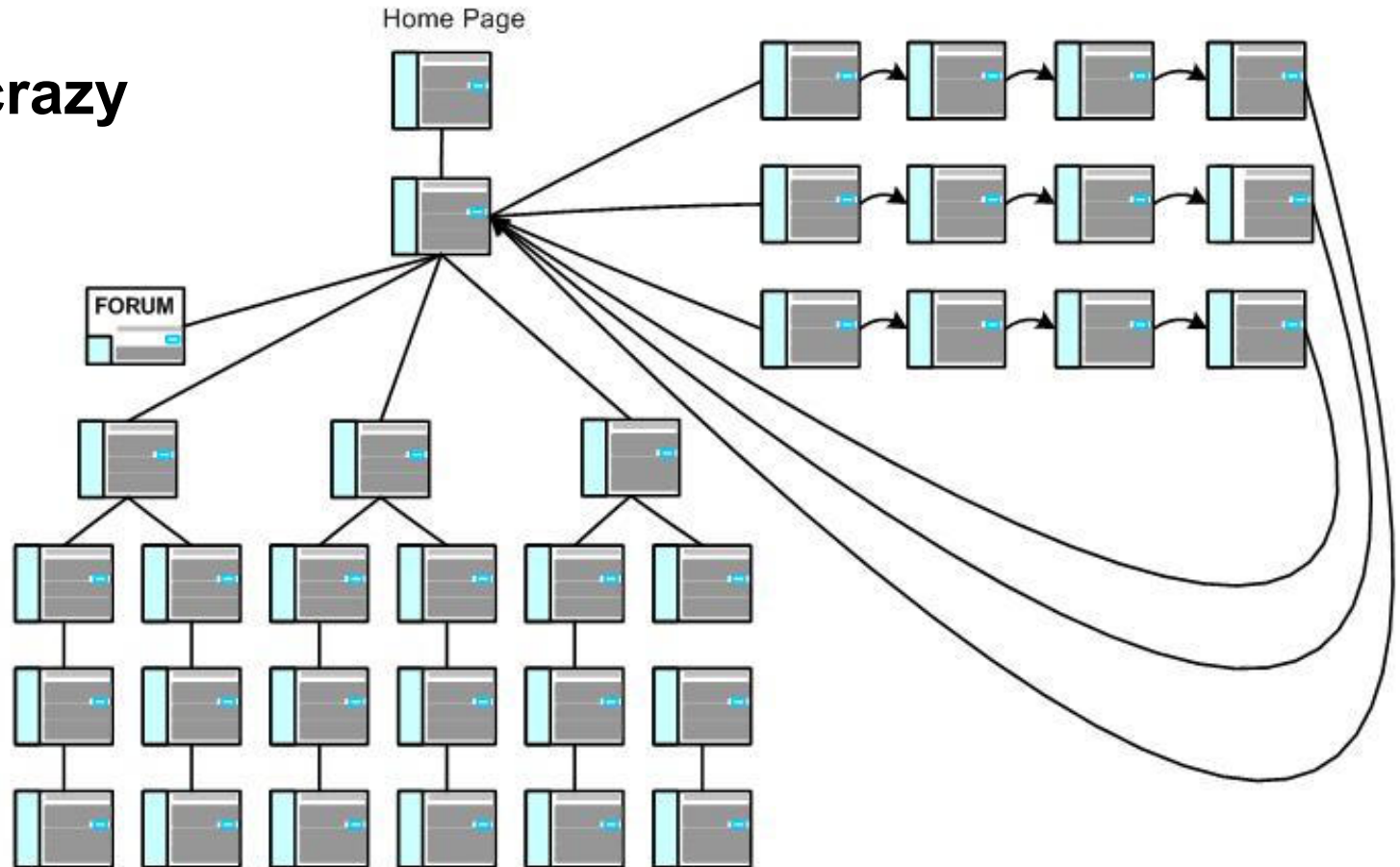
Richer experience



J Med Internet Res. 2005 Apr-Jun; 7(2): e12.

III. Basic concepts and principles

Let's get crazy



J Med Internet Res. 2005 Apr-Jun; 7(2): e12.

III. Basic concepts and principles

Organizational/structural systems

Creating the high level information architecture of a site

Developing major categories of information and creating relationships among them

One way to represent a web space is a “wireframe”

It is a skeletal rendering of every click-through possibility on your site

A text-only “action,” “decision” or “experience” model

It depicts the flow of specific logical and business functions and identifies entry and exit points users see on the site

III. Basic concepts and principles

This process is done before the actual design begins

It is not concerned with design, navigation, content or developers' and designers' concepts of how to produce the site

A wireframe begins with “what” and “action” questions:

What is the purpose of this page?

What does a visitor do at this point?

Where can a visitor go from here?

You ignore questions about what the site looks like

III. Basic concepts and principles

The wireframe provides a complete text-only schematic of the site

It displays the business logic and user functionality efficiently

This is kept separate from all other issues

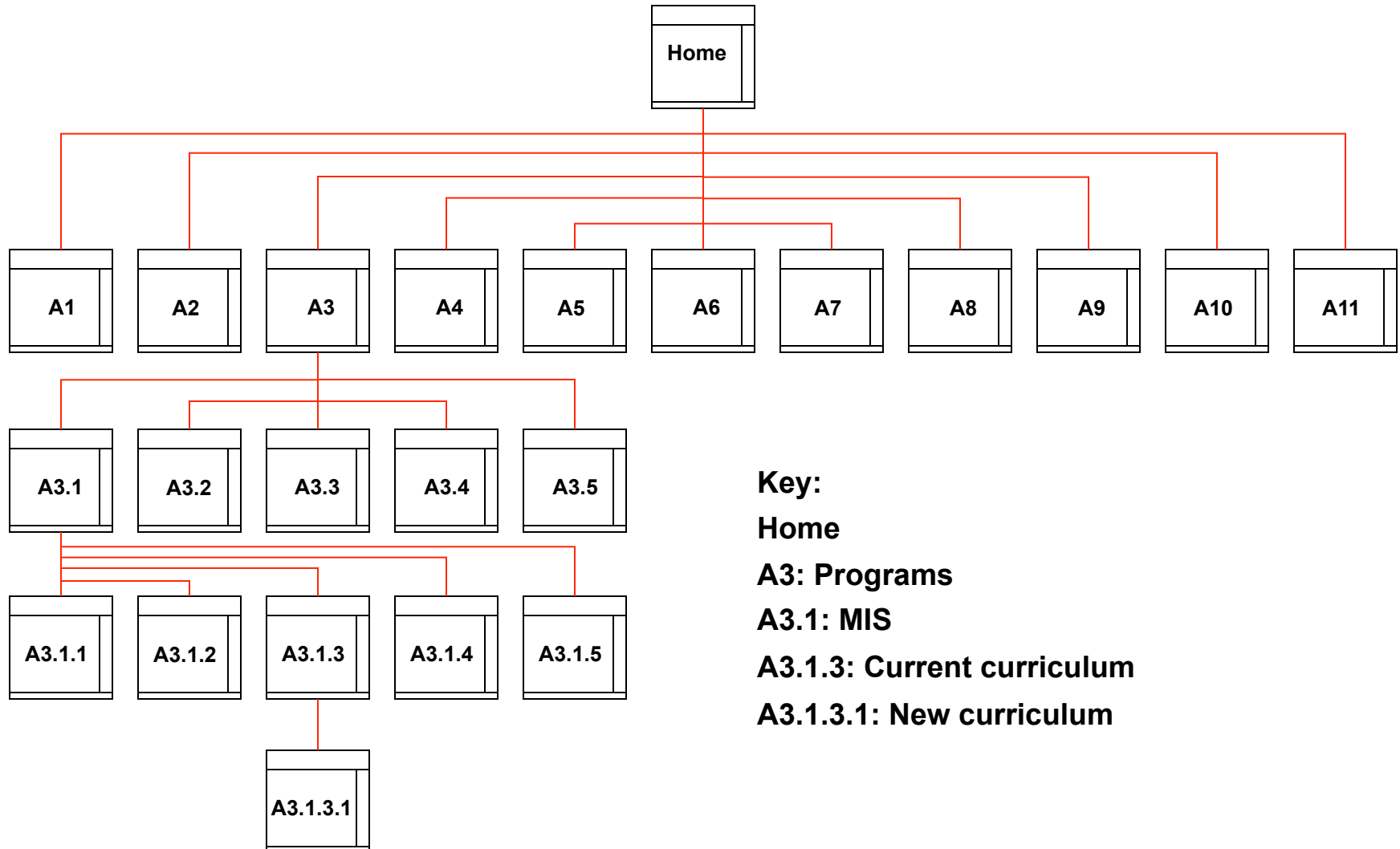
A clean wireframe makes the development of the prototype much easier

It can be done on paper

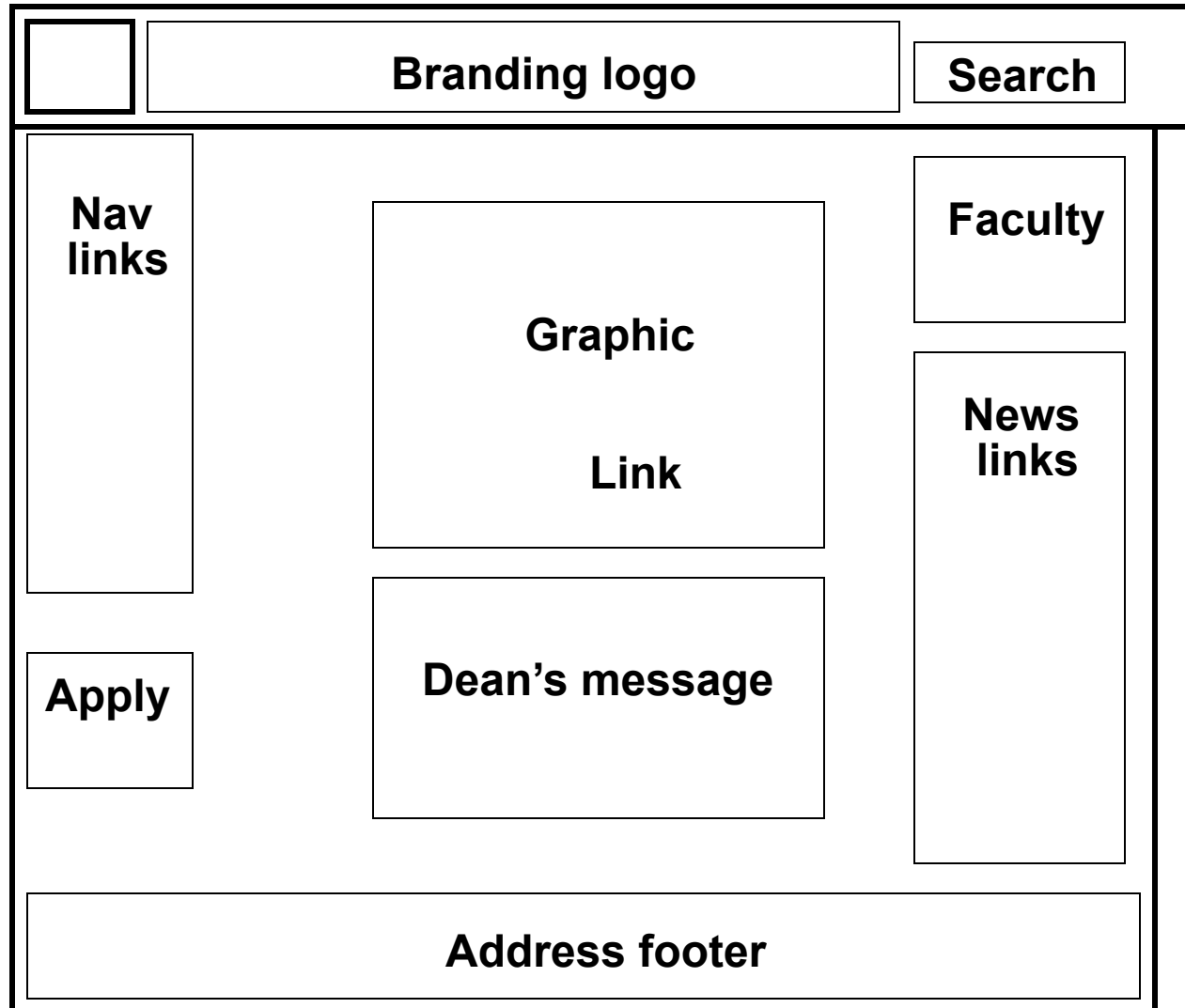
It can also be done on the web

People can easily see the organization and structure

III. Basic concepts and principles



III. Basic concepts and principles



III. Basic concepts and principles

Organizing information

Classify, label, and catalog content for easy navigation

Deal with ambiguity and heterogeneity

Clear language is essential, especially for major section headings

Present information with varying degrees of granularity (resolution)

Different types of information may be side by side (links to articles and journals)

Links may lead to single pages or groups of pages

Information may also be available in varying formats



III. Basic concepts and principles

Classification and categorization: a difference that makes a difference

Jacob argues that classification and categorization are both means of organizing and grouping information, but they are essentially two different types of systems

The differences are important because they affect the ways in which we organize, search for, and retrieve information.

~ What are the fundamental differences between these two ways of organizing information?

~ In terms of information work, why do these differences matter?

III. Basic concepts and principles

Our common sense understanding of classifying and categorizing is that they are synonymous

Both are ways to organize information, but influence the functional activities of IS in different ways

Assumes information is an emergent property

It is the result of meaningful differences, is inherently semantic and therefore about reality

Systems have four functions

Identifies information resources, represents attributes of relevant resources, organizes representations or resources for access; retrieves a set of resources in response to queries

III. Basic concepts and principles

Categorization

Dividing the world into groups of entities whose members are in some way similar to each other

Allows us to discover order in a complex environment

A fundamental cognitive mechanism that simplifies the our experience of the environment

Reduces load on memory and facilitates efficient storage and retrieval of information

Divides the experienced world into categories whose members share a perceptible similarity within a given context

III. Basic concepts and principles

We find order and meaning by imposing boundaries

We split and group objects to create distinct “islands of meaning”

Creates a context or conceptual frame that provides information about an entity

We create new relationships and information whose value exceeds the simple grouping of objects

The features associated with a category are composed of context-dependent and -independent information

The apparent instability of categories reflects the flexibility and plasticity of the process of categorization

III. Basic concepts and principles

Classification

Refers to three distinct but related concepts

A system of classes, ordered according to a predetermined set of principles and used to organize a set of entities

The classification system as a representational tool used to organize a collection of information resources

A group or class in a classification system

The process of assigning entities to classes in a classification system

III. Basic concepts and principles

Involves the orderly and systematic assignment of an entity to one and only one class within a system of mutually exclusive and non-overlapping classes

It is systematic (consistent), artificial (created) and arbitrary (reflects one perspective)

Taxonomy is the science of classification: “the theory and practice of delimiting kinds of organisms”

Classification scheme: a set of mutually exclusive and non-overlapping classes arranged within a hierarchical structure

Reflects a predetermined ordering of reality

III. Basic concepts and principles

Bibliographic classification schemes

Deductive, top-down schemes that enumerate a set of mutually exclusive classes

Enumerative classification schemes begin with a universe of knowledge and a theory of organization or set of principles

This establishes the conceptual structure of the scheme

Construction is a logical process of division and subdivision of the original universe

Each class, or each level of classes in the structure, is differentiated by a particular characteristic or property

III. Basic concepts and principles

Differences between classification and categorization

Classification involves mutual exclusivity of membership into non-overlapping classes

Categorization is more flexible

Classification uses predetermined criteria

Categorization uses observed similarities among entities

Classes have necessary and sufficient qualities

Categories have sets of observed similarities that may shift with the context

III. Basic concepts and principles

Classification schemes are stable and rigid with fixed boundaries

Categorization schemes can vary with context and have fuzzy boundaries

There are stable relationships among classes

Relationships among categories are more fluid

Once classified, entities are ungraded and are equally representative of the class

Once categorized, entities can be ranked by typicality



III. Basic concepts and principles

Ontology research and development. Part 1 - a review of ontology generation

Ding and Foo argue that ontologies are an important way to improve information organization and review relevant research projects

Ontologies are representations of shared conceptualizations of phenomena or domains that allow the communication of heterogeneous information

~ The authors argue that ontologies will be crucial to the semantic web. Do you agree? Why?

~ Why is it important that ontologies are reusable?

III. Basic concepts and principles

Ontologies are important in IA work

They are shared understandings of common domains

Set of classes or concepts

These concepts have relations, functions, axioms, instances

It is formal (machine readable) and explicit

They capture the consensual knowledge of a community

Allow the transfer of heterogeneous information

Ding, Y. and Foo, S. (2002). Ontology research and development. Part 1 - a review of ontology generation *Journal of Information Science*, 28(2), 123-136

III. Basic concepts and principles

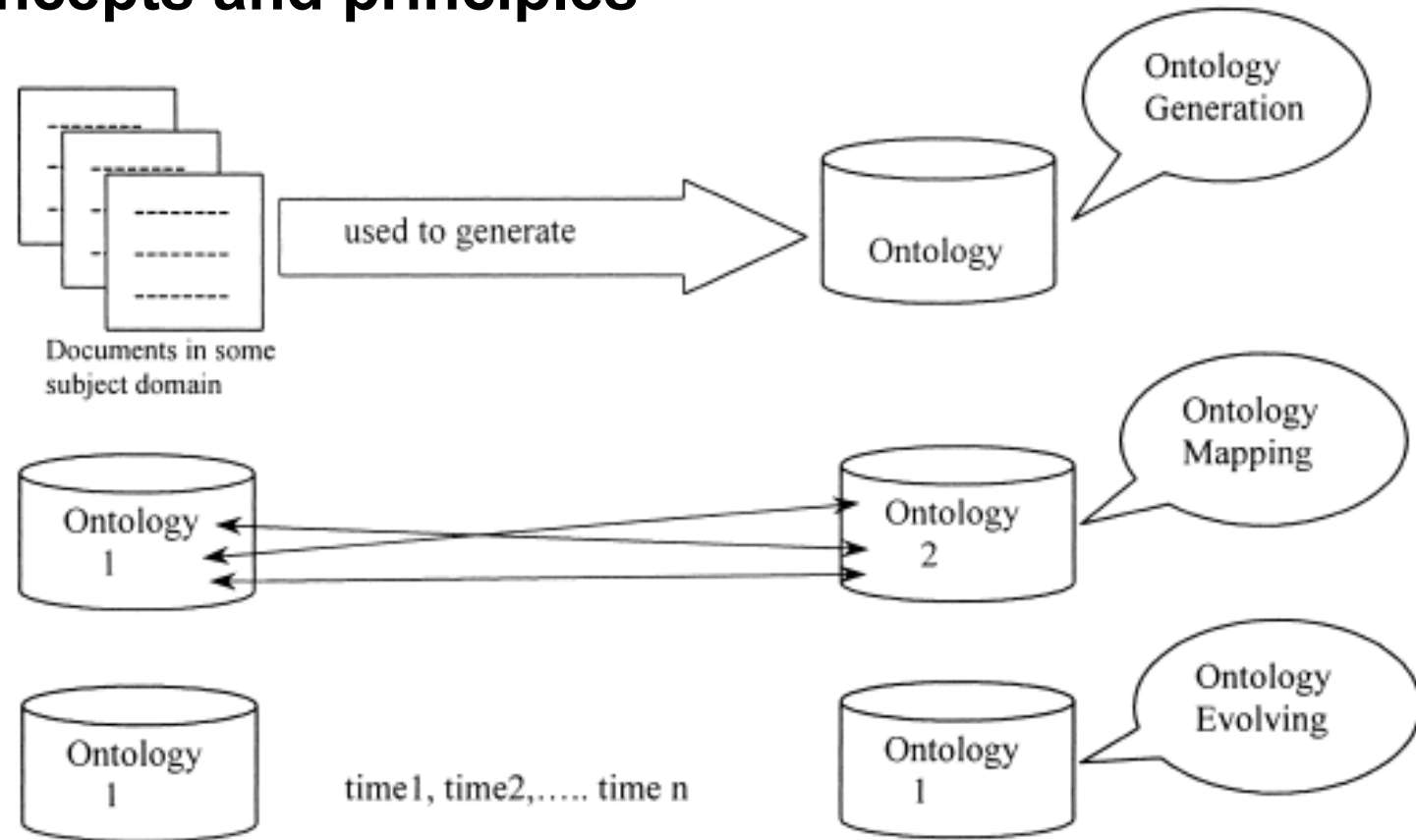


Fig. 1. General overview of ontology generation, mapping and evolving.
Ding and Foo 2002; 124

III. Basic concepts and principles

An ontology is a reference model for a domain

It provides a consistent standard and is reusable

In the semantic web, they act as metadata representing the semantics of data

Typically created by hand so they are hard to update

There is work on automated ways to generate them

Top down: generalization to specialization

Bottom up: specialization to generalization

Middle out: important concepts to generalization and specialization

III. Basic concepts and principles

1. Identify purpose and scope

2. Create the ontology

Ontology capture: identify and define key concepts and relationships

Ontology coding: settle on basic terms (class, entity, relation)

Choose a representation language and write code

Integrate existing ontologies

3. Evaluation

4. Documentation and guidelines for each of the previous phases

III. Basic concepts and principles

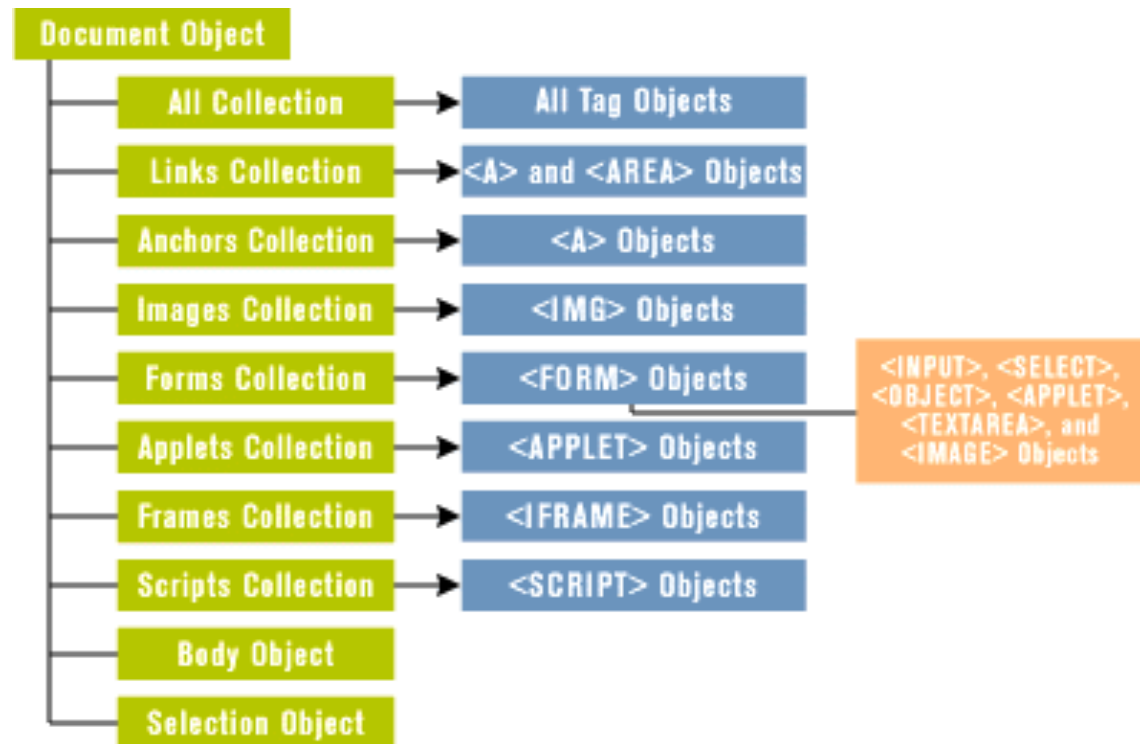
The final resulting ontology should be clear with unambiguous definitions and terms

Consistent and coherent

Externally consistent

Extensible and reusable

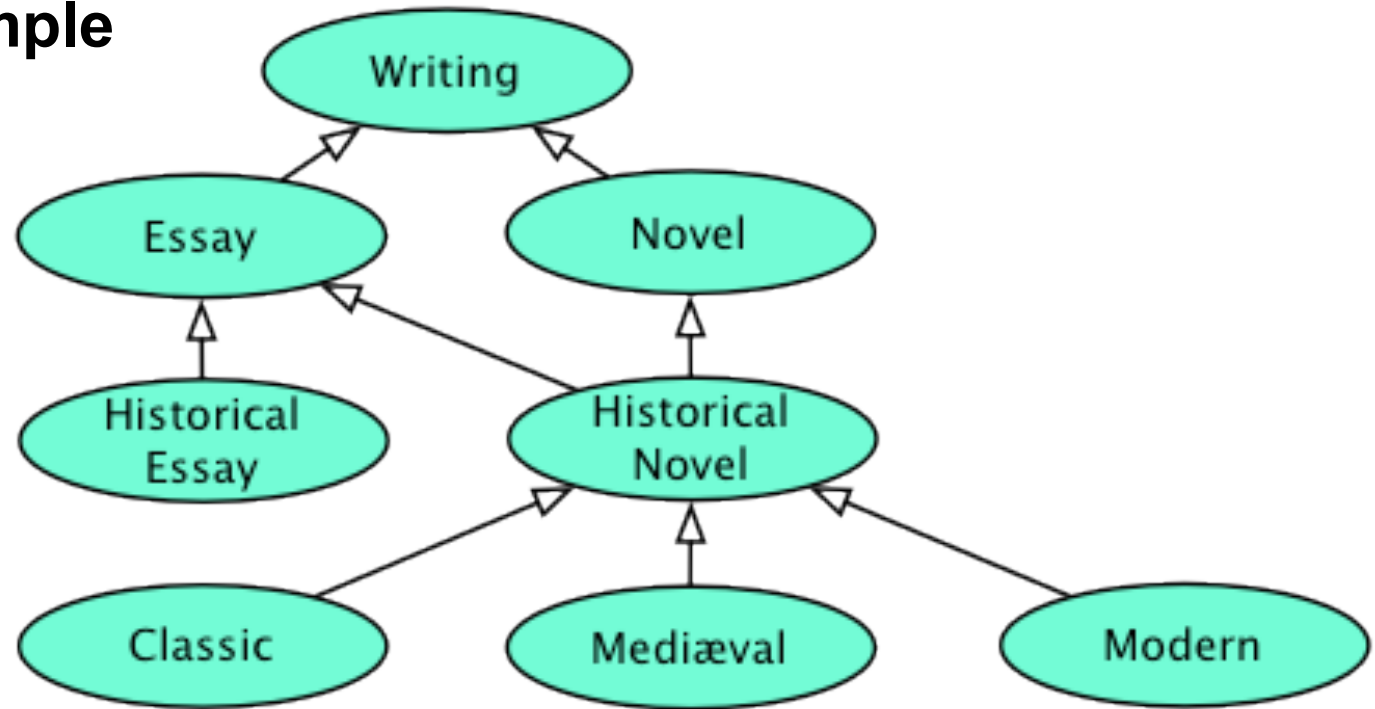
Designed for reuse



<http://www.microsoft.com/mind/0797/dynamichtml/dynamicfig04.gif>

III. Basic concepts and principles

Another example



<http://reverse.net/publications/download/REVERSE-RP-2005-44/images/books-ontology-01.png>

III. Basic concepts and principles

When ontologies don't work...



<http://www.useit.com/alertbox/9605.html>

III. Basic concepts and principles

Making use of ontologies in IA

Labeling and navigation

The way the information is organized affects the way that people understand it

Organization is also important because it affects labeling and navigation

The basic task is to classify the site's content into categories and develop links among the categories

What are the shared characteristics of site's content?

How are sets of characteristics related?

What is the best way to represent these sets?

III. Basic concepts and principles

Folksonomy: an ontology created by many people who are active in the domain

Collaboratively generated, open-ended labels that categorize content such as Web pages, online photographs, and inks

Allows classification and retrieval

Metadata can be applied by professionals, creators, or users

The last is the most chaotic and becoming more popular