Information Design

Week 8

MSDN Account

All the accounts are created. If students did not get an email then they already had an account.

All you need to do is to give your students this URL
http://msdn06.e-academy.com/elms/Storefront/Home.aspx?campus=csun_e_ceng

and have them click on the login and forgotten my password link. Then put in their CSUN gmail account and it will send them their account info.

Or you could have them email me (Mark Siegmund [msiegmund@gmail.com]).
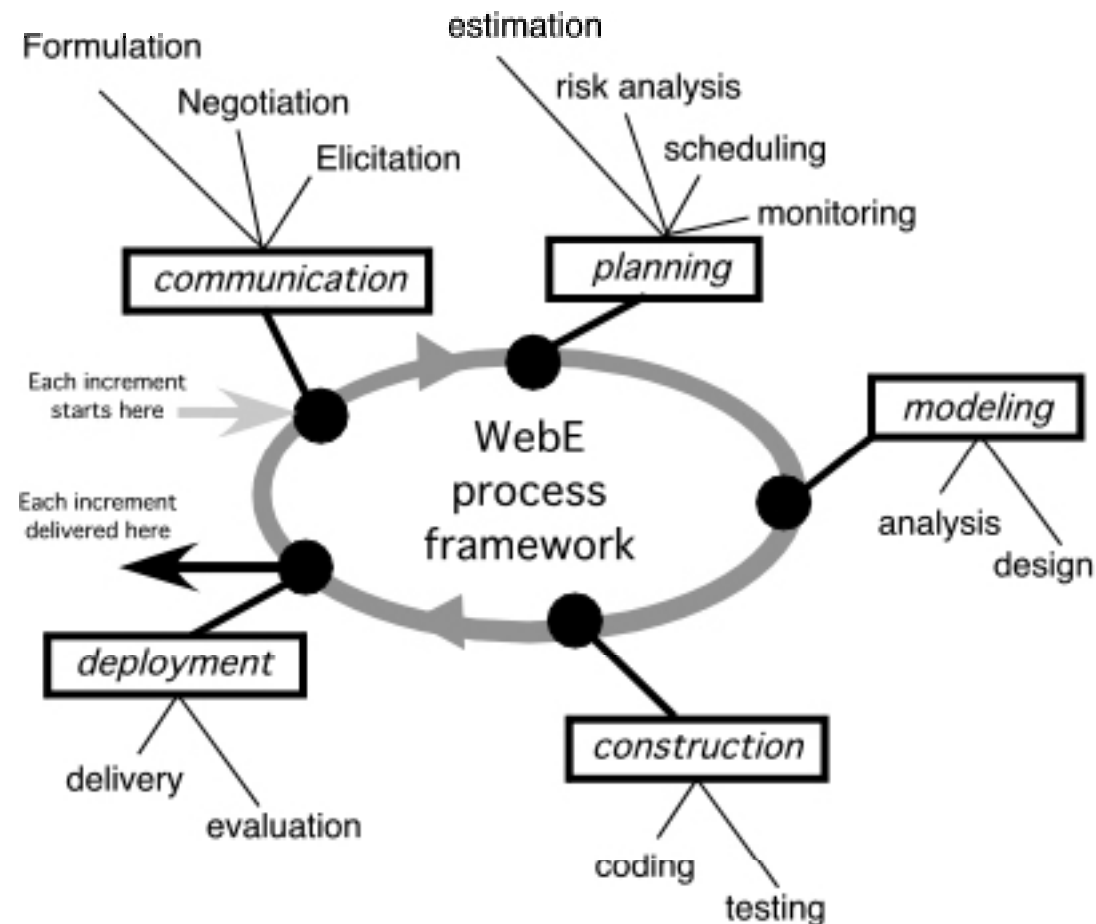
Agenda (Lecture)

- Information design

Agenda (Lab)

- Weekly progress report

- Homework/Lab assignments

Team Lab Assignment #7

- Submit the first version of the information design document for your group project
  - Make slides for presentation

- Due date
  - The beginning of the 3/21 lab session

WebE Process Activities & Actions

Chapter 10 - *Information Design*

- Three key issues:
  - **Content.** What content is available?
  - **Composition.** What views on that content do we wish to provide users?
  - **Navigation***.* How do the users gain access to those views?

- There are different levels of abstraction at which we might consider these information design issues

- Information design addresses *how content can be organized, accessed, and managed*

Information Architecture (IA)

- The overall strategy for information design usually combines both bottom-up and top-down approaches:
  - Bottom-up: Commonly used for small WebApps; Build pages and progressively link them into the structure.
  - Top-down: Considers overall organization – the realm of the *Information Architect.*

- *"The structural design of an information space to facilitate task completion and intuitive access to content"* [Ros02]

Information Architecture (IA)

- As simple as a site map that represents the basic WebApp navigational structure

- May be a detailed model that provides a comprehensive overview of the approach for structuring, managing, and accessing information within a WebApp

- Provides a skeleton around which all information aspects of the WebApp are built:
  - Describe the basic information "structure" of the solution
  - Position this within the overall information "landscape" in which the WebApp exists.

Example Preliminary Site Map
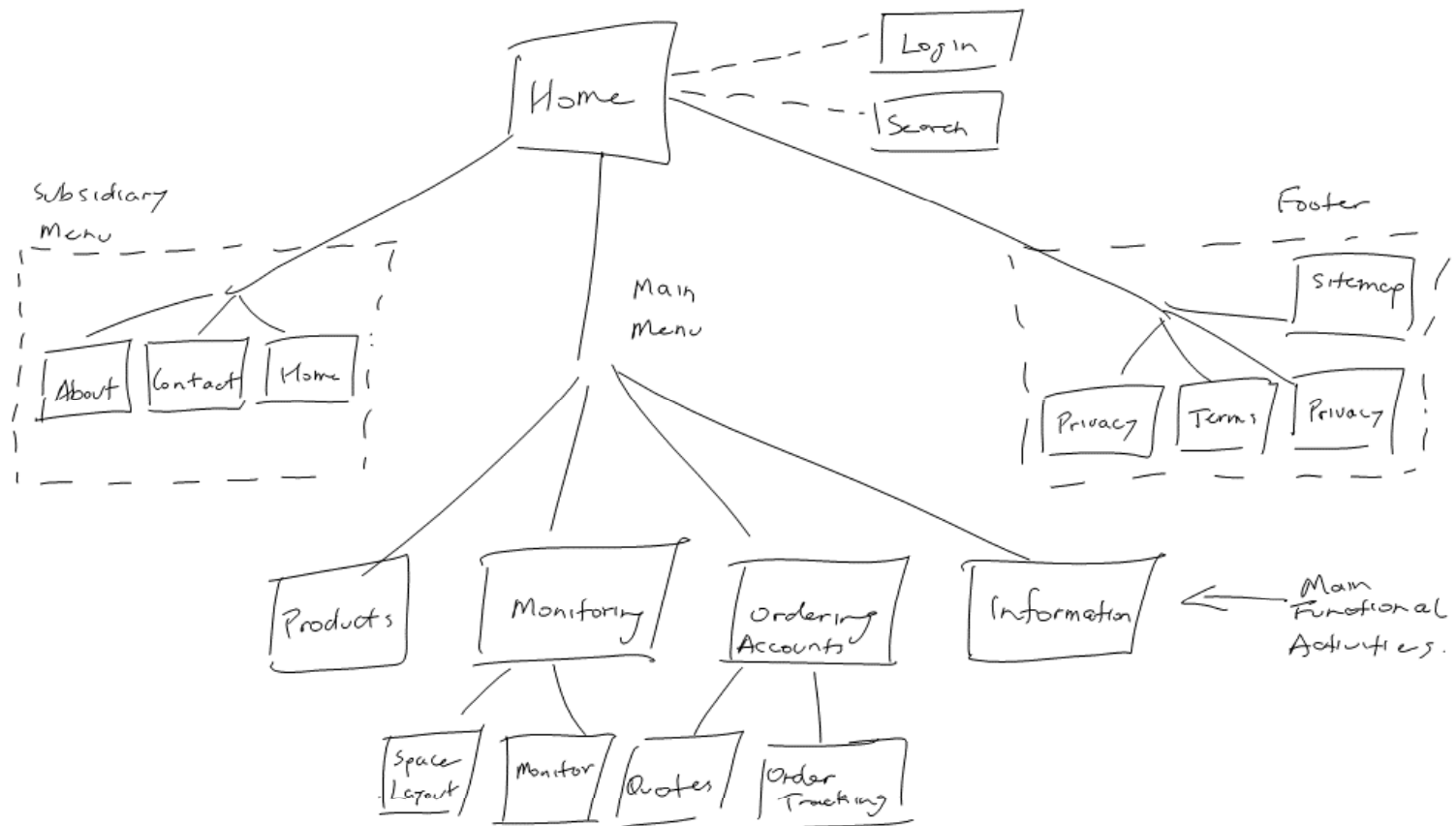
IA Characteristics

- **Composition with multiple, dynamic data.** The model must support the ability to group different information items into a presentation and the expression of constraints among these items.

- **Higher-level presentation specification.** The model should be able to specify constraints across multiple information items.

- **Temporal relations.** Certain information items may have time-based relationships, which can be important to their presentation (e.g., a link to information about an event might only be relevant up until that event is held).

- **Context for links and link semantics.** The ability to control the presentation depending upon which links are followed.

- **Separation of content and information.** Content is the collection of data sources that are available for use. Information is what is useful to the users of the WebApp.

- **Separation of information and application.** A WebApp IA should differentiate between the information that a user would find meaningful, and the structural ways in which this information might be arranged and accessed.

- **Separation of application and presentation.** If we separate the presentation mechanisms from the application, then the portability and genericity of applications (ability to be applied to other applications or problems with minimal change) will be substantially enhanced.
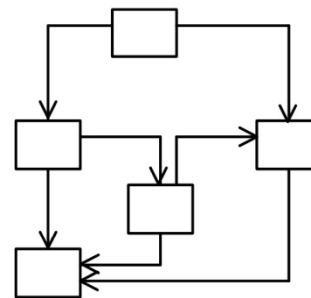
Structuring the Info Space

- The information structures that are created during information design can be classified in various ways
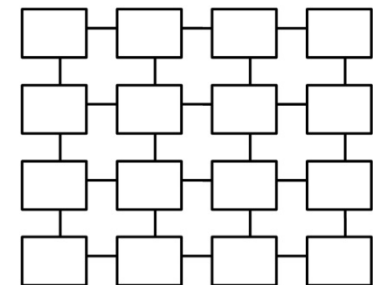 - What application domains do you think are suited to each of these structures?
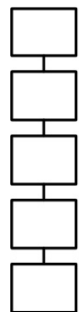
Linear
Structure
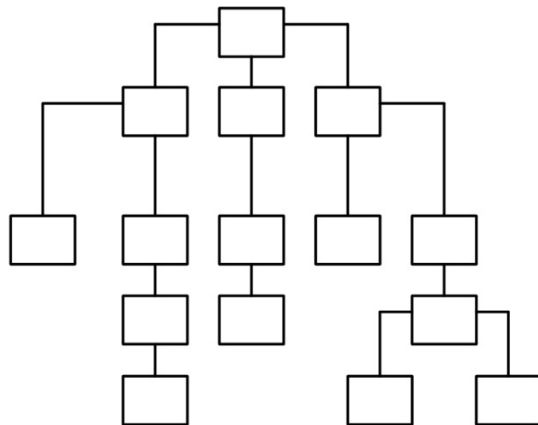
Hierarchichal
Structure

Network Structure

Matrix Structure

What Makes a "Good" Structure

- For hierarchical structures:
  - *Meets the information needs of the users and is easy to navigate!*
  - The breadth and depth of the information structure can have a strong impact on how much effort it takes a user to navigate to information that is needed
  - *The appropriate fan-out of the hierarchical structure should relate to the complexity of the WebApp options and how distinct the choices are*
    - Fan-out is a measure of the width of the navigation structure below a single node.
  - Hierarchies based on exact values and clear categorizations will typically not be ambiguous.

Blueprints: Adding Detail

- Shows how the various content objects map into a specific information structure
  - Captures additional information to a sitemap
- A blueprint might also discuss:
  - Whether content is dynamic or static
  - Whether content is personalized for individual users (and in what ways)
  - What content objects are mapped to which Web pages
  - What navigational paths will address given tasks

- Allows you to visualize how a WebApp might fit together and, hence, how users might respond to it
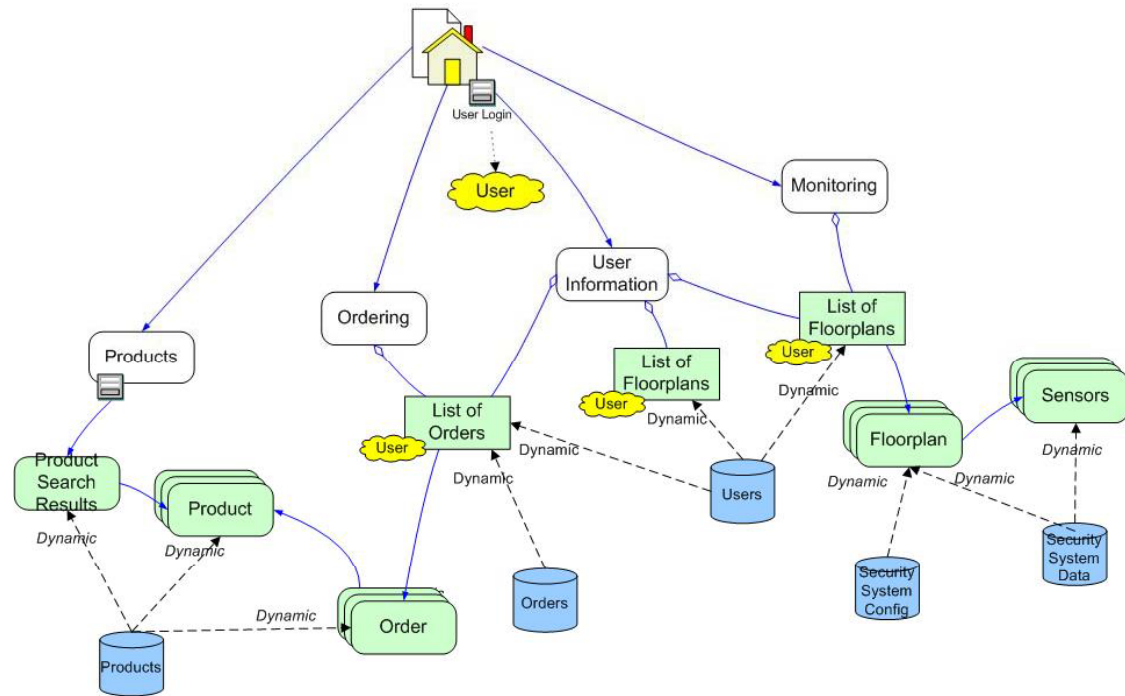
Blueprints

Basic
notation
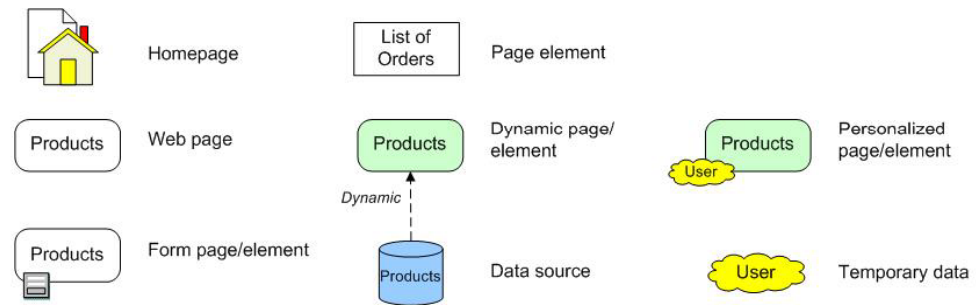
Example blueprint
structure

Accessing Information

- A number of other factors affect the ability of users to achieve their goals: generally relate to navigational mechanisms and characteristics:
  - WebApp mechanisms that allow users to understand what navigation options are available at any given time (e.g. menus)
  - Interface mechanisms that provide users with an indication of where they are and what they are currently seeing (e.g. breadcrumbs)
  - Navigation mechanisms that allow users to travel within the information structure. (e.g. searching)

- Each must be considered as part of the information design

Understanding context

- Have you ever navigated into a complex WebApp and felt "lost in hyperspace"?

- When this happens, you lose track of where you are within (or beyond) the WebApp.

- It's a common problem that can leave the user disoriented and unable to acquire needed information or invoke appropriate functionality.

Defining Context - Guidelines

- **Clear labeling**. develop a set of local standards that lead to a clear set of labels for all link anchors.
  - Anchors describe the destination of the link and can be crucial for ensuring that users understand where they have landed when following a link

- **Breadcrumbs**. It's always a good idea to know where you've come from as you navigate deep into an information structure

- **Identity**. Each Web page should clearly identify the nature of the site or subsite to which presented information belongs

Moving through the Info Structure

- An information architect should:
  - tune navigational support to the specific characteristics of the IA
  - design search mechanisms that lead the user to desired information while filtering out extraneous content.
  - help experienced users achieve their navigational goals more quickly
  - provide inexperienced users with additional navigational support

- Accomplished with:
  - **Global links**. These links are provided on every Web page and point to commonly visited WebApp locations or functions.
  - **Shortcuts.** These are ways of bypassing the normal navigational route and jumping over intermediate steps straight to a particular location within the information space
  - **Breadcrumbs and trails.** We have already noted that breadcrumbs are useful for helping users to locate themselves.

Searching Mechanisms

- Allows a user to bypass the imposed navigational structure and jump directly to specific locations within the WebApp

- A search engine can often be used more profitably by constraining its scope.

- Pages on the right of the figure (representing unstructured information) are less amenable to prescribed navigation and therefore become the focus of the search function
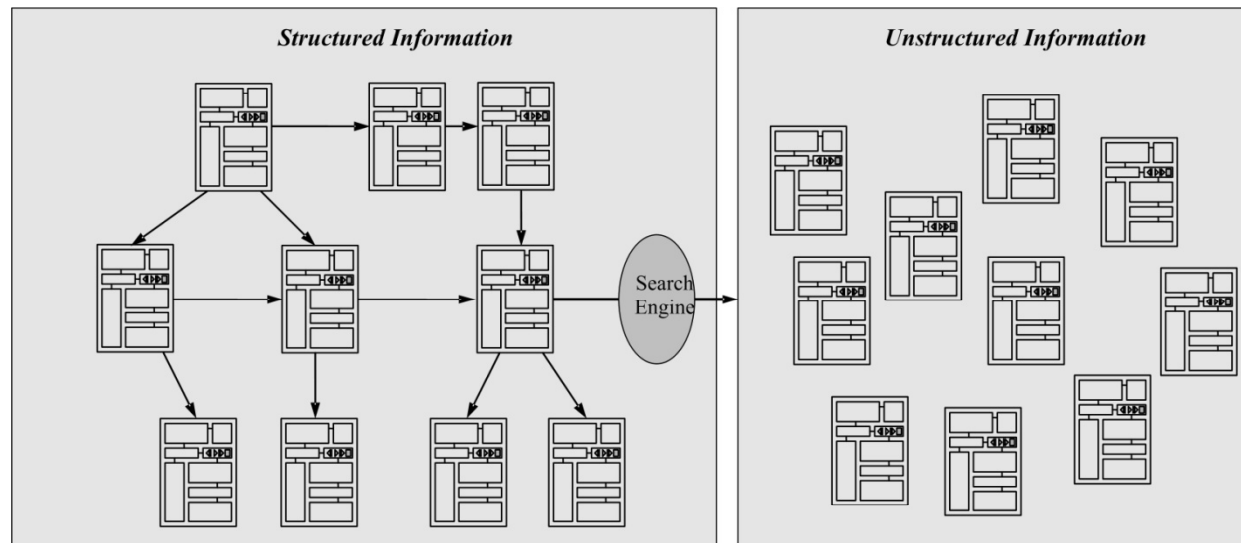
Wireframe Models

- Conceptual layout of pages

- Captures core information and navigational elements.

- Supports both information design and interaction design.
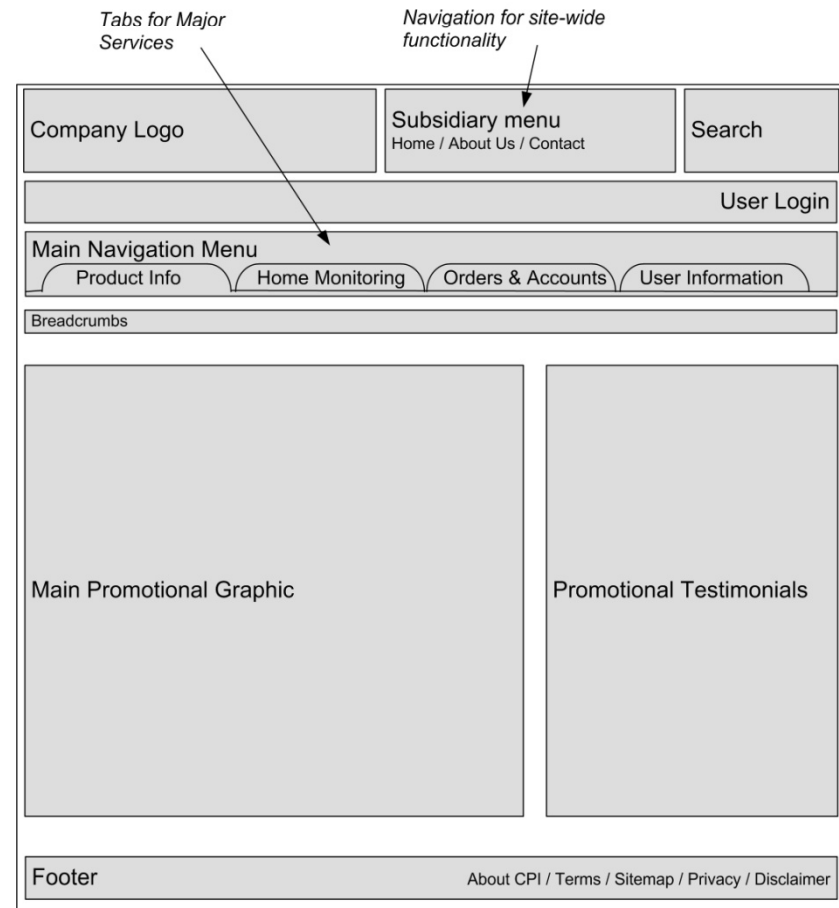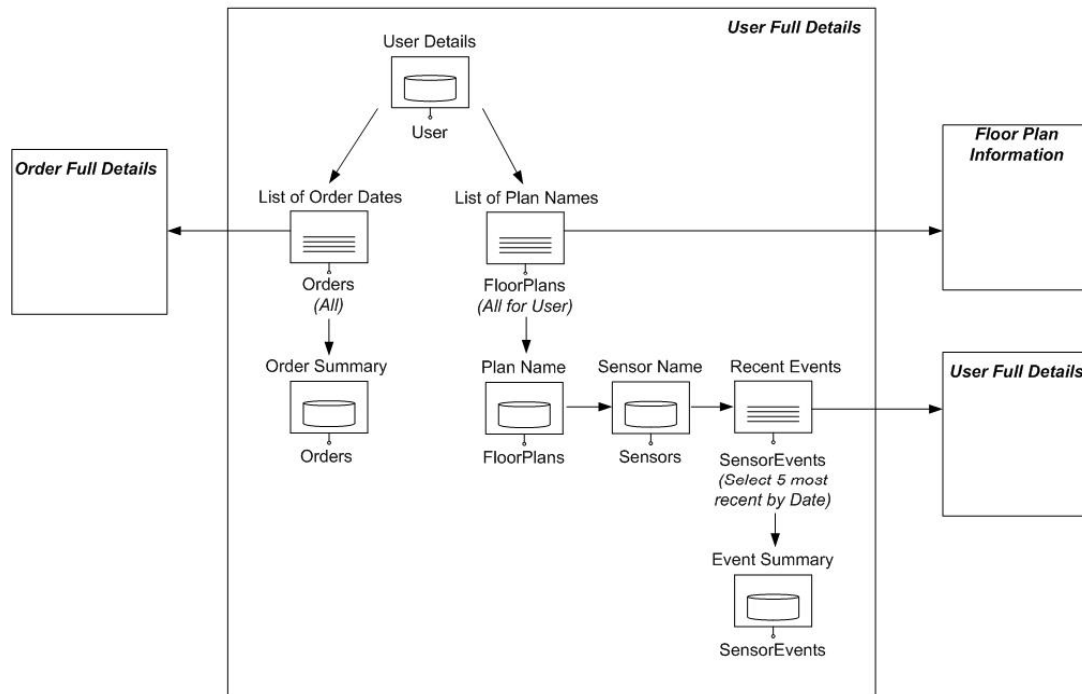
Navigation Design

- The *Relationship Management Methodology* (RMM) [Isa95] is an early navigation design approach – useful for illustrating concepts.
  - *ER modeling* defines the information domain of the application by identifying content (data) objects, attributes, relationships, and various type indicators that comprise the WebApp information space.
  - *Slice design* determines detailed information structure and access mechanisms by grouping content from the domain (captured in the ER model) into collections that can or should be presented together in order to be useful and meaningful
  - *navigation design* establishes the links between the various slices and creates the information units that have interest for various user categories.

- Ultimately, these information units are aggregated and are transformed into Web pages. The navigation design links these pages by selecting all slices that are the target of a link derived from an ER diagram.

RMM Modeling
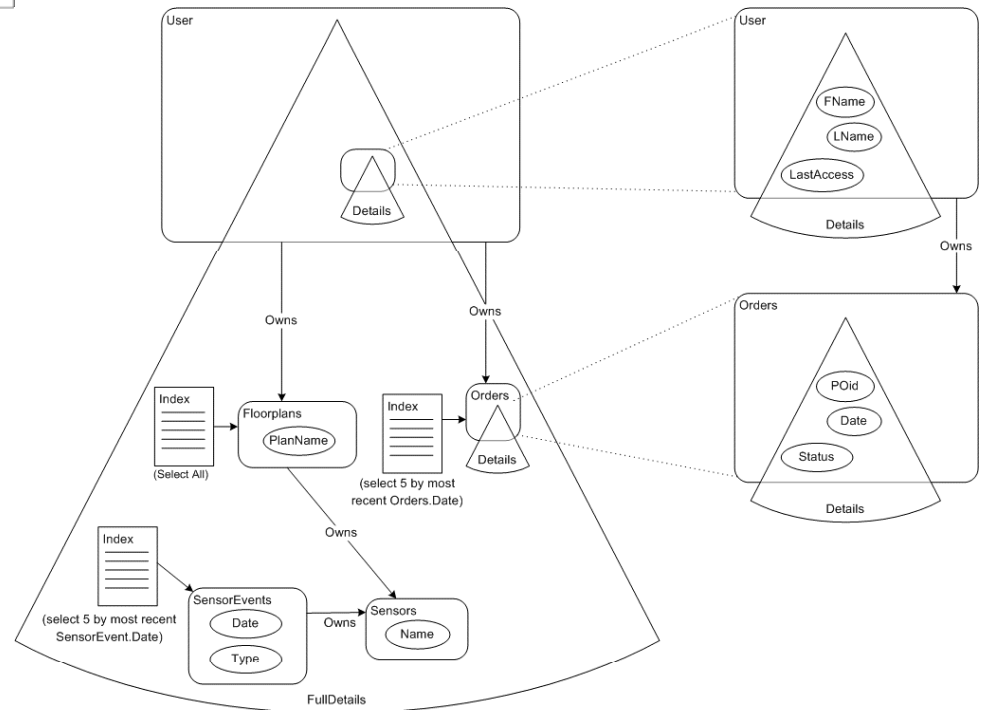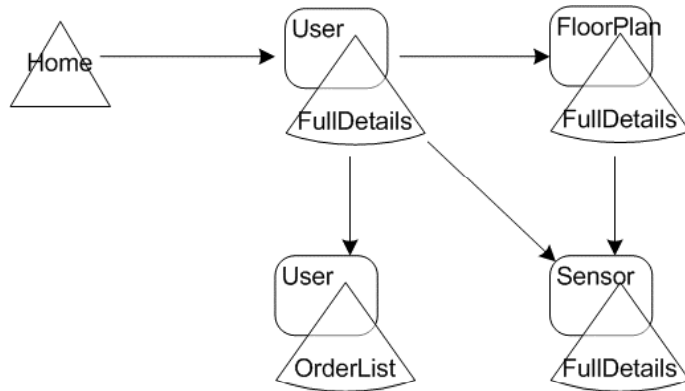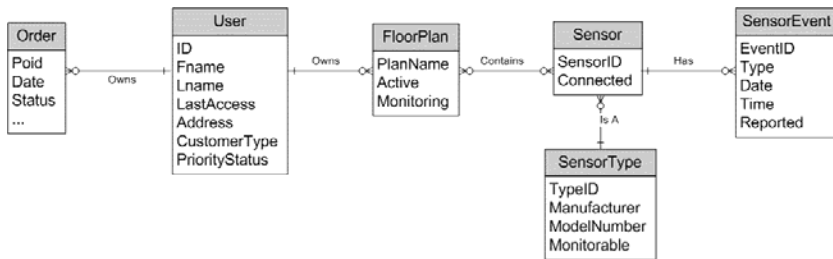
Other Approaches

- A more recently developed, and richer, notation than RMM is the *Web Modeling Language* (WebML)
  - incorporates robust support for aspects such as workflow modeling, presentation and content adaptation, personalization, and design patterns

- *Web Application Extension for UML* (WAE) is a design approach that links the informational perspective with functional WebApp components.
  - indicates how functional components generate and/or provide information and how the information (through aspects such as link activation or form submission) triggers functional components.
  - models the connection between client-side content and behavior, and server-side functionality.

(a)

Order
- Poid
- Date
- Status
- ...

0:N — Owns — 1:1

User
- ID
- Fname
- Lname
- LastAccess
- Address
- CustomerType
- PriorityStatus

1:1 — Owns — 0:N

FloorPlan
- PlanName
- Active
- Monitoring

0:N — Contains — 0:N

Sensor
- SensorID
- Connected

1:1 — Has — 0:N

SensorEvent
- EventID
- Type
- Date
- Time
- Reported

Sensor 0:N — Owns — 1:1 SensorType

SensorType
- TypeID
- Manufacturer
- ModelNumber
- Monitorable

(b)

User Full Details

User Details — User

Order Full Details

List of Order Dates — Orders (All)

List of Plan Names — FloorPlans (All for User)

Floor Plan Information

Order Summary — Orders

Plan Name — FloorPlans

Sensor Name — Sensors

Recent Events — SensorEvents (Select 5 most recent by Date)

User Full Details

Event Summary — SensorEvents

= Boundary object (web page)

= Entity object (e.g. database content)

= Server-side control object (e.g. processing module)

= Client-Side control object (e.g. Javascript function)

Login Error

User Full Details

Homepage

User Login

Validate Login

Construct User Details

Check Data

Alert Invalid Details

User Data

Generate List of Orders

Generate Plans and Events

Orders

FloorPlans

Sensors

Events

Information Design: Summary

Information Design: Summary

- The formality of the design process should be tuned to the characteristics of the WebApp
  - **Application scale.** As size grows, we need to be able to assess the quality of the design *before* construction begins.
  - **Information volatility.** As content becomes more dynamic a clear architecture becomes more important, but detailed models could inappropriately constrain the WebApp evolution.
  - **Application volatility.** If overall requirements change frequently then focus on those aspects that are known to be stable.
  - **User heterogeneity.** As end-user diversity increases it becomes more difficult to ensure that there is overall consistency in the information structures and information access paths. Consequently, the blueprint increases in importance.
  - **Application criticality.** WebApp quality becomes the central focus when a WebApp is mission critical. Reviews that focus on design work products are a useful tool.

- The decision about the appropriate depth of modeling for a specific WebApp project should be made early during the design process and not left to an ad hoc decision driven by time pressures.