Information Architecture

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Bachelor in Informatics Engineering and Computation (L.EIC)

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Outline

➔ Defining Information Architecture

➔ Elements

➔ Process

➔ Deliverables

➔ LBAW: "A3. Information Architecture" artefact

Defining Information Architecture

Context

➔ We live in information societies, where information services and systems are pervasive and abundant in everyday life, and increasingly essential to the operation of multiple businesses.

➔ A growing volume of information is available to us, which resulted in a problem of managing attention in the face of a decreasing "signal-to-noise" ratio.

➔ The proliferation of applications and electronic devices, multiplied the number of channels through which we can access the same information. This resulted in a decoupling of information from its container, no longer 1-1.

➔ Both problems — information overload and the multiplication of access channels — are tackled by the field of information architecture.

Places Made of Information

➔ Information products and services are perceived by as "places made of information", where people go for different tasks: learn, shop, connect with other people, etc.

➔ User experience in these places is defined by a familiar vocabulary consisting of labels, menus, descriptions, buttons, links, visual elements, and content.

➔ Different uses of this language will make them "distinct" places to the user, and will help them (or not!) be more efficient in accomplishing their tasks and goals.

➔ Information architecture considers these information-rich spaces and its design for maximizing their effectiveness, whatever the users' goal.

Information Architecture

➔ Multiple definitions, each highlighting a particular aspect.

➔ Richard Wurman (1996) emphasizes **organization** and **presentation**:

- ➔ *(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.*

➔ Rosenfeld and Morville (2015) introduce **multiple perspectives**:

- ➔ *The structural design of shared information environments.*
- ➔ *The synthesis of organization, labeling, search, and navigation systems within digital, physical, and cross-channel ecosystems.*
- ➔ *The art and science of shaping information products and experience to support usability and findability, and understanding.*
- ➔ *An emerging discipline and community of practice focused on bringing principles of design and architecture to the digital landscape.*

Context of Information Architecture

- ➔ The evolution of the web and digital tools brought many opportunities and challenges to users and designers.
- ➔ The pervasiveness of digital spaces in everyday life increasingly blurs the distinction between physical and digital.
- ➔ Information Architecture is needed to organize these spaces, specifically:
  - ➔ Connecting information objects and intended users;
  - ➔ Identify concepts and pathways for access and navigation;
  - ➔ Creating tools and systems for people to organize information;
  - ➔ Connect various information spaces, applications, platforms, and channels.
- ➔ Tackling these challenges requires skill from multiple fields, e.g. usability, design, information.
- ➔ User Experience (UX) Design is an umbrella under which these areas converge.

Related Disciplines

➔ Usability Engineering — focus on human computer interaction and how user interfaces can allow the users to accomplish their tasks.

➔ Information Science — a broad interdisciplinary field focused on theories, applications, and technologies related to the creation, organization, retrieval and use of information.

➔ Human Factors Engineering — ergonomics and physical factors in designing products, processes, and work environments.

➔ Visual Design — aesthetics and communication of information, using visual language elements such as colors, shapes, spacing, alignment, etc.

➔ Interaction Design — how a system works in response to user inputs, i.e. the dynamics between the user and the system.

Summary

- ➔ Information architecture is a central element in user experience design.
- ➔ It deals with the process of planning, designing and building information spaces.
- ➔ Its goal is to improve information access, management and use, through the design of meaningful, functional and effective information spaces.
- ➔ Is a field of growing importance, as frontiers between physical and information spaces blur.

- ➔ Information architecture is relevant for an Informatics Engineer, because:
  - ➔ Improves work in the context of multidisciplinary teams, i.e. understand the language and the artefacts;
  - ➔ Contributes to the development of better prototypes and products.

Elements of Information Architecture

Elements of Information Architecture

- The main components of an information architecture include:
  - Organization systems - how information is categorized;
  - Labeling systems - how information is represented;
  - Navigation systems - how you can move through the information;
  - Searching Systems - how information can be searched for.

Organization Systems

Organizing Information Spaces

➔ The way things are organized impacts its meaning, i.e. the way they are perceived.

➔ Well-organized information is easier for people to find and work with.

➔ Organizing things is hard, it is necessary to deal with ambiguity, heterogeneity, different perspectives, politics, etc.

➔ An organization scheme defines the shared characteristics of items and the grouping of those items.

➔ They can either be exact organization schemes or ambiguous organization schemes.

Exact Organization Schemes

- In exact organization schemes, information elements are divided into well-defined and mutually exclusive sections.

- These scheme are relatively easy to design and maintain.
  - **Alphabetical scheme**, where alphabetical ordering is used to layout information items, examples include: person directory, services directories, libraries.
  - **Chronological scheme**, where time-based factors are central in organizing information items, classic exemples include: calendars, tasks lists, news (?).
  - **Geographical scheme**, where place is the key factor in organizing information items, examples include: house or rental listings, transportation.

Ambiguous Organization Schemes

- Language and concepts are ambiguous in nature.
- Ambiguous organization schemes are important because people don't always have an exact definition of what they are looking for, but harder to design and maintain.
  - **Categorical schemes**, where topics, themes are the factors considered in organizing information items. These properties have subjective interpretations, depending on the knowledge, viewpoints, etc of users. Examples: newspapers, academic courses, books.
  - **Hierarchical schemes**, where information items are organized according to value, from most to lest or vice-versa. The key aspect is that it requires value to be assigned to the information. Examples: social networks, search engines.
  - **Audience-specific schemes**, make sense when multiple audiences exist. This can result in breaking an information space into smaller audience-specific sub-spaces, or including more or less information depending on the audience. Examples: intranets, academic services.

Labeling Systems

Labeling Systems

➔ Labeling is a form of representation.

➔ Just as words represent concepts and ideas, labels represent parts of information in information spaces. Example: "About" or "Contact Us" are well-established labels.

➔ Labels can either be textual or iconic (more ambiguous).

➔ Textual labels include: contextual links, headings, navigation systems choices.

➔ Labels can be designed looking at existing information environments (what is used in other contexts or by others in similar contexts) or search logs (what language users use for searching).

Navigation Systems

Embedded Navigation Systems

- ➔ The purpose of navigation is to help users move around.
- ➔ Navigation systems provide context and a sense of control to users as they explore.
- ➔ A good navigation system should help the user answer the following questions:
  - ➔ Where am I?
  - ➔ What can I do?
  - ➔ Where can I go from here? (up, down, parallel)

Types of Navigation Systems

➔ There are various types of navigation systems, three common ones are:

- ➔ **Global navigation systems**, it is intended to be present in every page, often implemented as a navigation bar at the top, allow direct access to key areas of the system. A central element in the overall usability of a space.
- ➔ **Local navigation systems**, complement the global system and allow users to explore and navigate the immediate subsection.
- ➔ **Contextual navigation systems**, support navigation through the association of concepts that exist in the content being presented. Examples include "see also" or link to related items in different areas.

Types of Navigation Systems

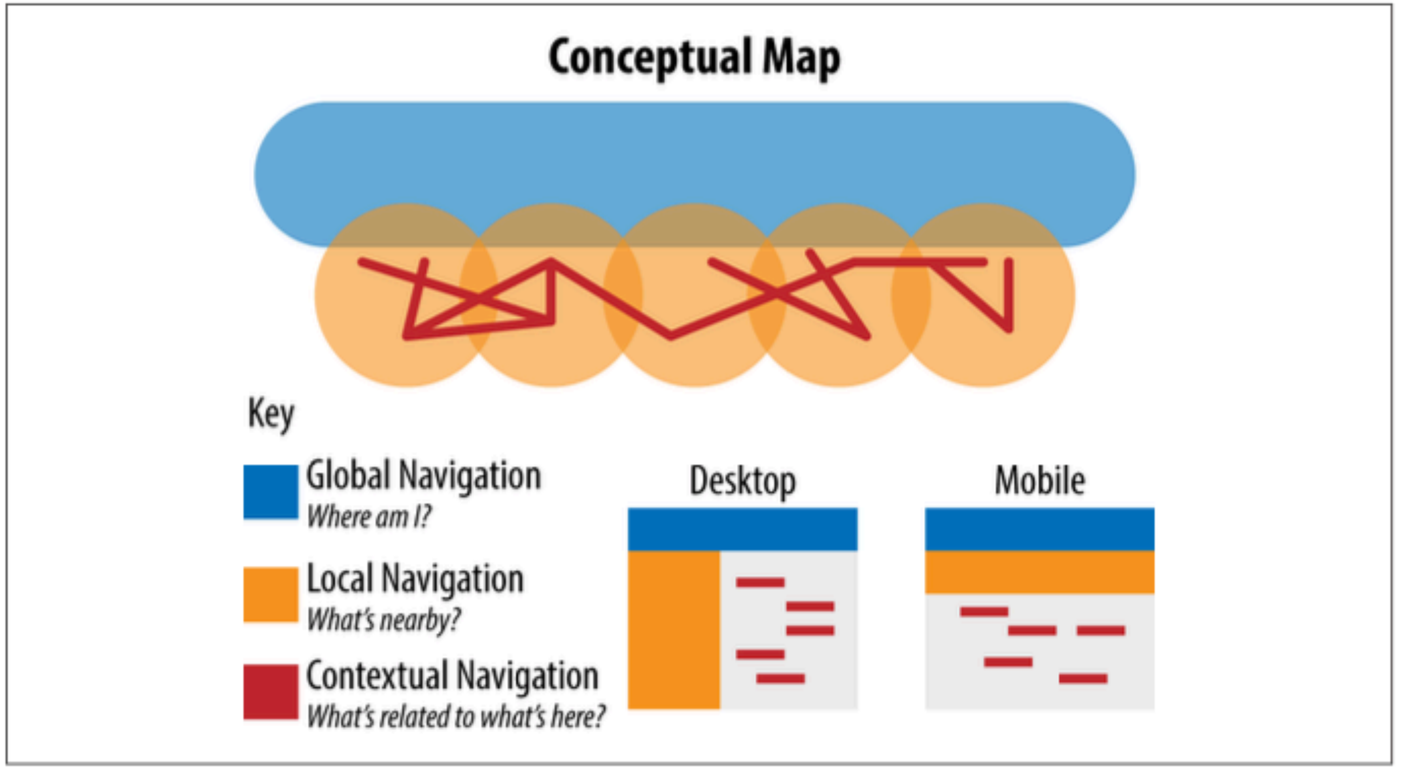


Figure 8-1. Global, local, and contextual embedded navigation systems

Image from: Rosenfeld et al. Information Architecture - For the Web and Beyond, O'Reilly (2015)

Supplemental Navigation Systems

- Supplemental navigation systems are external to the basic hierarchy of a system and provide complementary ways of finding content and completing tasks.
- Examples include: sitemaps, site indexes, breadcrumb trails, FAQs, tutorials, search.
  - **Sitemaps** provide a broad view of the content in the system and facilitates random access to individual items.
  - **Breadcrumbs** are dynamic and represent the path followed by the user or, alternatively, the location of the content within the hierarchy.
  - **Search**, is a central mechanism for navigation, it provides users a direct access to the content they are looking for.

Sitemap

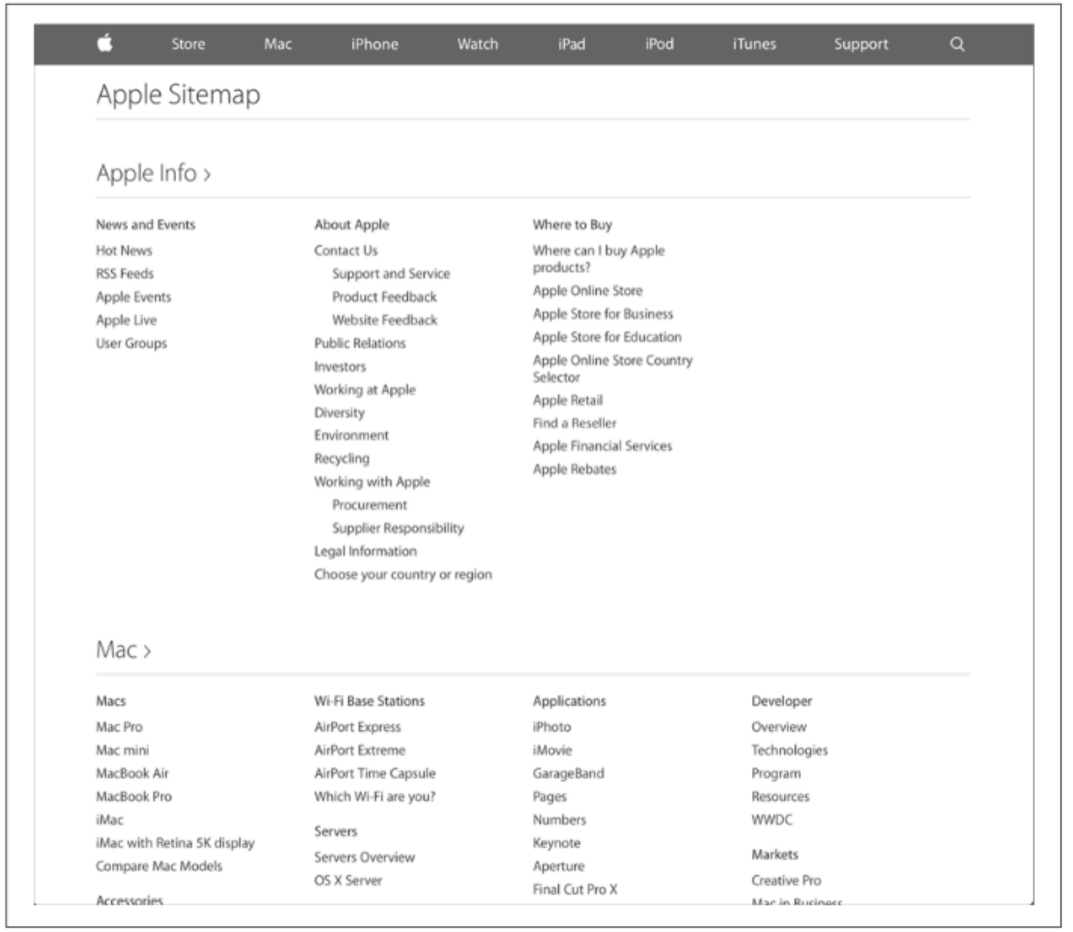


Figure 8-16. Apple's sitemap

Image from: Rosenfeld et al. Information Architecture - For the Web and Beyond, O'Reilly (2015)

Advanced Navigation Solutions

- Advanced solutions for navigation, include:
  - **Personalization**, serve information based on a model of the user, e.g. based on behavior, navigation, profile. Example: personalized recommendations in a shopping website.
  - **Customization**, give the user direct control over content and navigation options, e.g.visible options, preferences. Example: ordering or labels in a webmail application.
  - **Visualization**, provide navigation mechanisms based on visual properties of information items. Example: a visual search engine in a e-commerce website.
  - **Social navigation**, organize content access or navigation based on users' input. Example: ranking content by votes from other users (e.g. Reddit), or using users' tags to provide navigation features (e.g. Stackoverflow).

Search Systems

Search Systems

- ➔ Search is an advanced navigation mechanism.
- ➔ An apparently simple interface masks a complex system (covered later).
- ➔ Opting for a search system requires evaluation considering multiple issues, including:
  - ➔ Amount of content in the "information space".
  - ➔ Time and know-how to optimize the search system.
- ➔ Users expect search: it's a familiar tool, where users control of the vocabulary to find information, and can 'cut across' the existing structure.
- ➔ Multiple decisions are required, including which content fields to index, what text processing to perform, which additional filtering criteria to consider.

Search User Interface

➔ In designing the user interface, it is necessary to decide which information components to include in the search results.

➔ Complementary sorting options can be provided, e.g: relevance ranking, chronological, alphabetically, popularity, etc.

➔ Faceted search is an advanced mechanism commonly used in stores and complex information contexts.

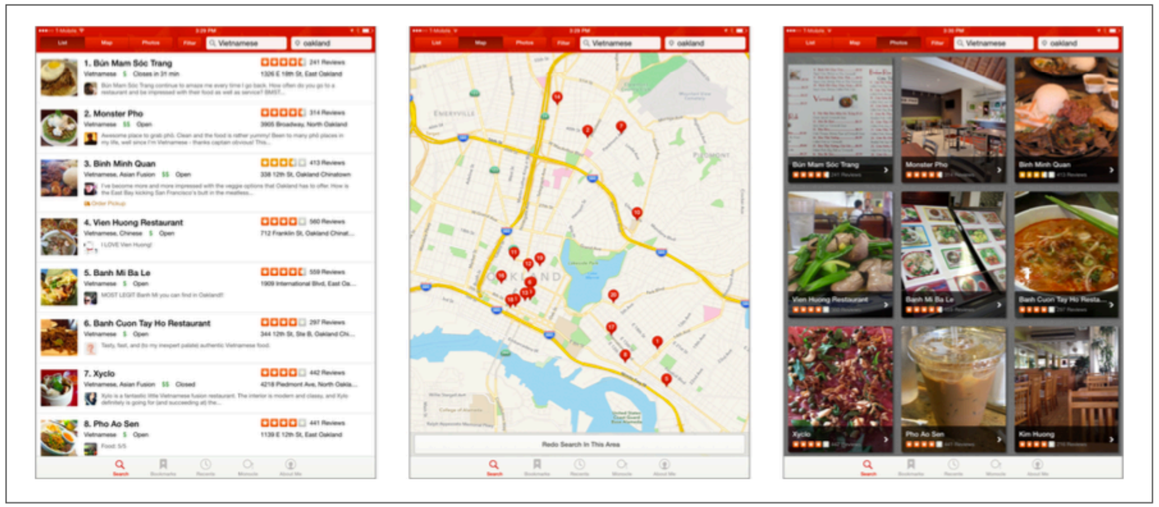


Figure 9-11. The Yelp iPad app allows users to select three different ways of viewing search results: as listings, as locations on a map, or as images

Image from: Rosenfeld et al. Information Architecture - For the Web and Beyond, O'Reilly (2015)

Faceted Search

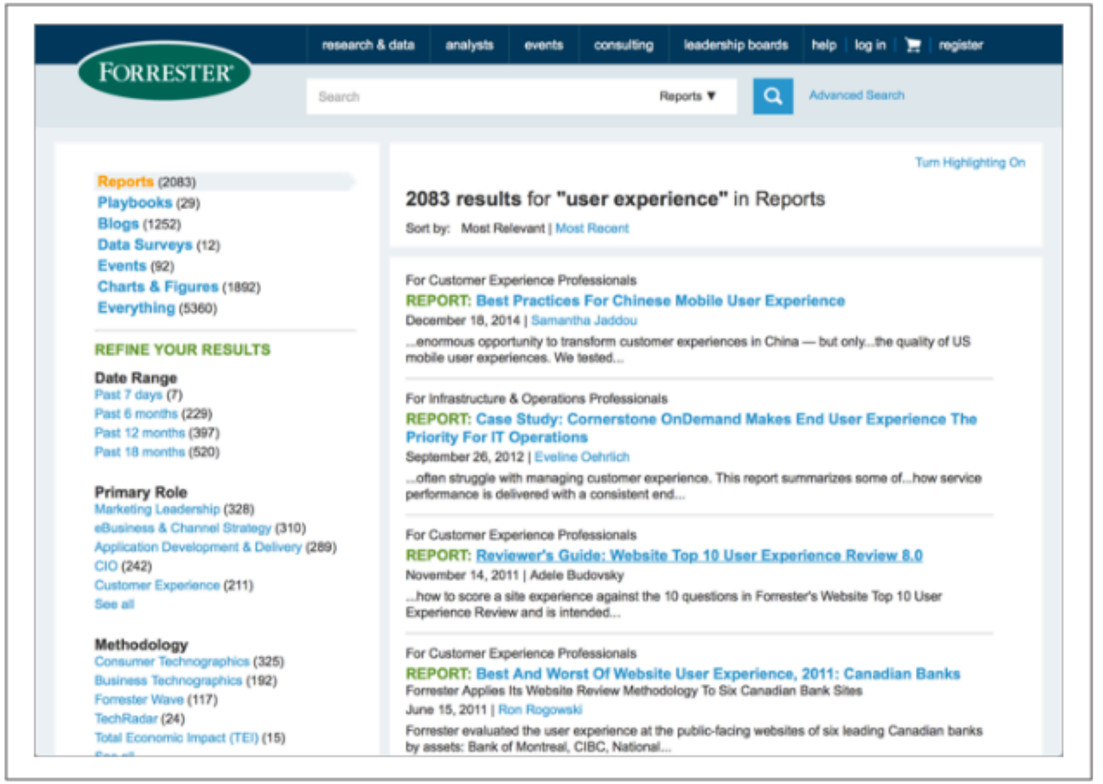


Figure 9-21. Forrester contextualizes search results for the query "user experience"

Image from: Rosenfeld et al. Information Architecture - For the Web and Beyond, O'Reilly (2015)

Best Practices in Search

- ➔ Support autocomplete
- ➔ Support query operators
- ➔ Provide context
- ➔ Allow query reformulation
- ➔ Support additional filters
- ➔ Support alternative rankings
- ➔ Customize snippets
- ➔ Highlight matched search terms

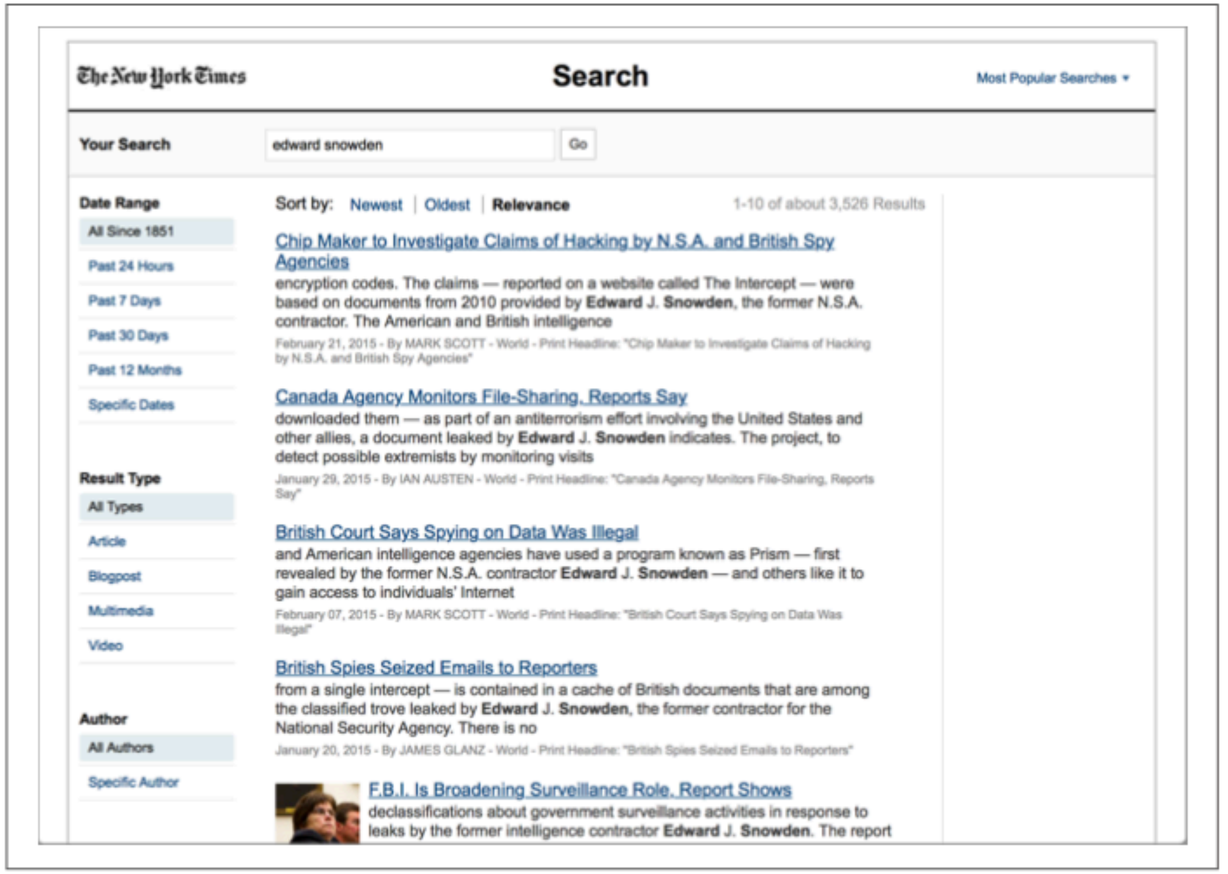


Figure 9-32. All aspects of the search are restated as part of these search results

Image from: Rosenfeld et al. Information Architecture - For the Web and Beyond, O'Reilly (2015)

Information Architecture Process

Information Architecture Process

- The design of information environments requires interdisciplinary teams, including interaction designers, software developers, content strategists, usability engineers, and other experts.

- An information architecture process is structured in four general activities:
  - **Research**, understands users, content, and context;
  - **Design**, specify the information architecture, creating detailed sitemaps, wireframes, etc;
  - **Implement**, solutions that adhere to the design and specifications produced;
  - **Evaluate**, and improve the system throughout its life cycle.

Research and Research Methods

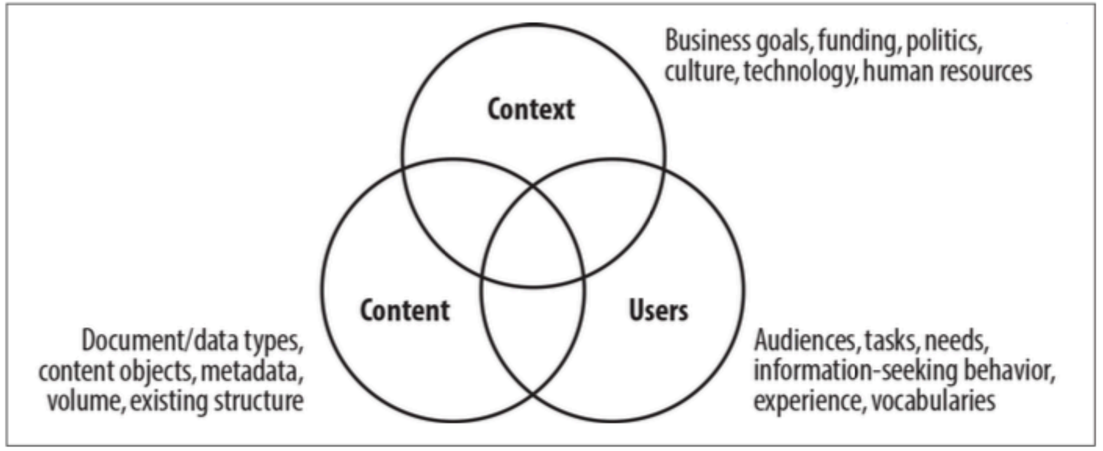


Figure 11-2. A balanced approach to research

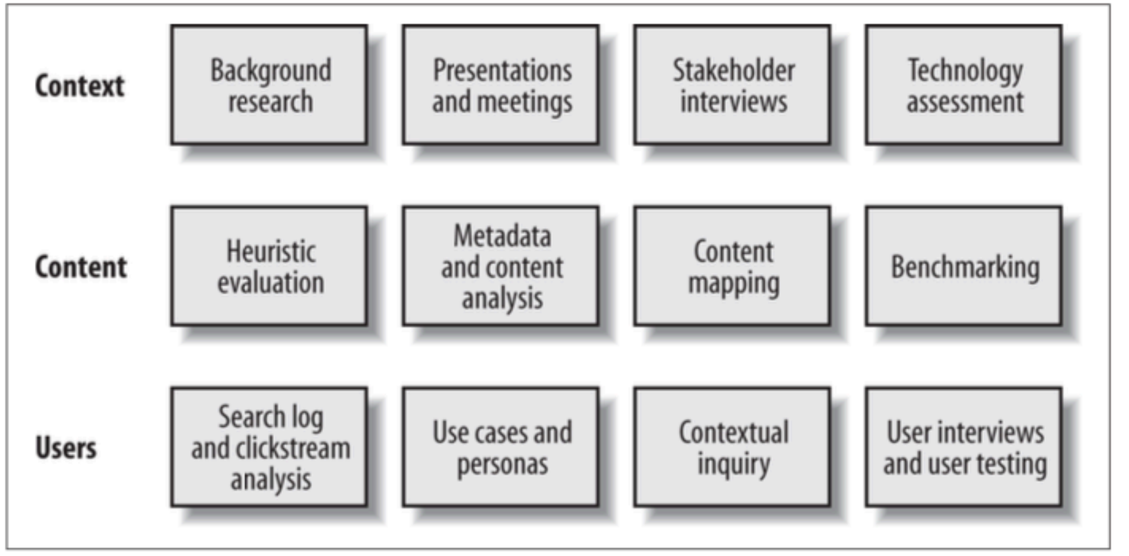


Figure 11-3. Tools and methods for research

Images from: Rosenfeld et al. Information Architecture - For the Web and Beyond, O'Reilly (2015)

Information Architecture Deliverables

Information Architecture Deliverables

- ➔ Deliverables are essential for any well-structured process.
- ➔ In multidisciplinary contexts, they work as "anchors" between teams and different project phases.
- ➔ Visual diagrams contribute to define:
  - ➔ Content components, i.e. what constitutes a unit of content, and how these are grouped.
  - ➔ Connections between components, i.e. how components are linked.
- ➔ Deliverables can provide multiple views, at different levels and for different audiences, over the information architecture of a system.
- ➔ Commonly used deliverables are sitemaps and wireframes. Others include wireflows, content inventories, prototypes, design mockups, etc.

Sitemaps

Sitemaps

➔ Sitemaps show the relationship between information elements, such as pages, and can be used to portray organization, navigation, and labeling systems.

➔ It can be used to portray the content organization, the navigation system, and the labeling systems. It provides a condensed view for both developers and users.

➔ High-level sitemaps are usually the result of a top-down design process.

➔ Sitemaps can be used to map specific areas or parts of a complex information environment.

➔ Adopt vector based tools that support collaboration.

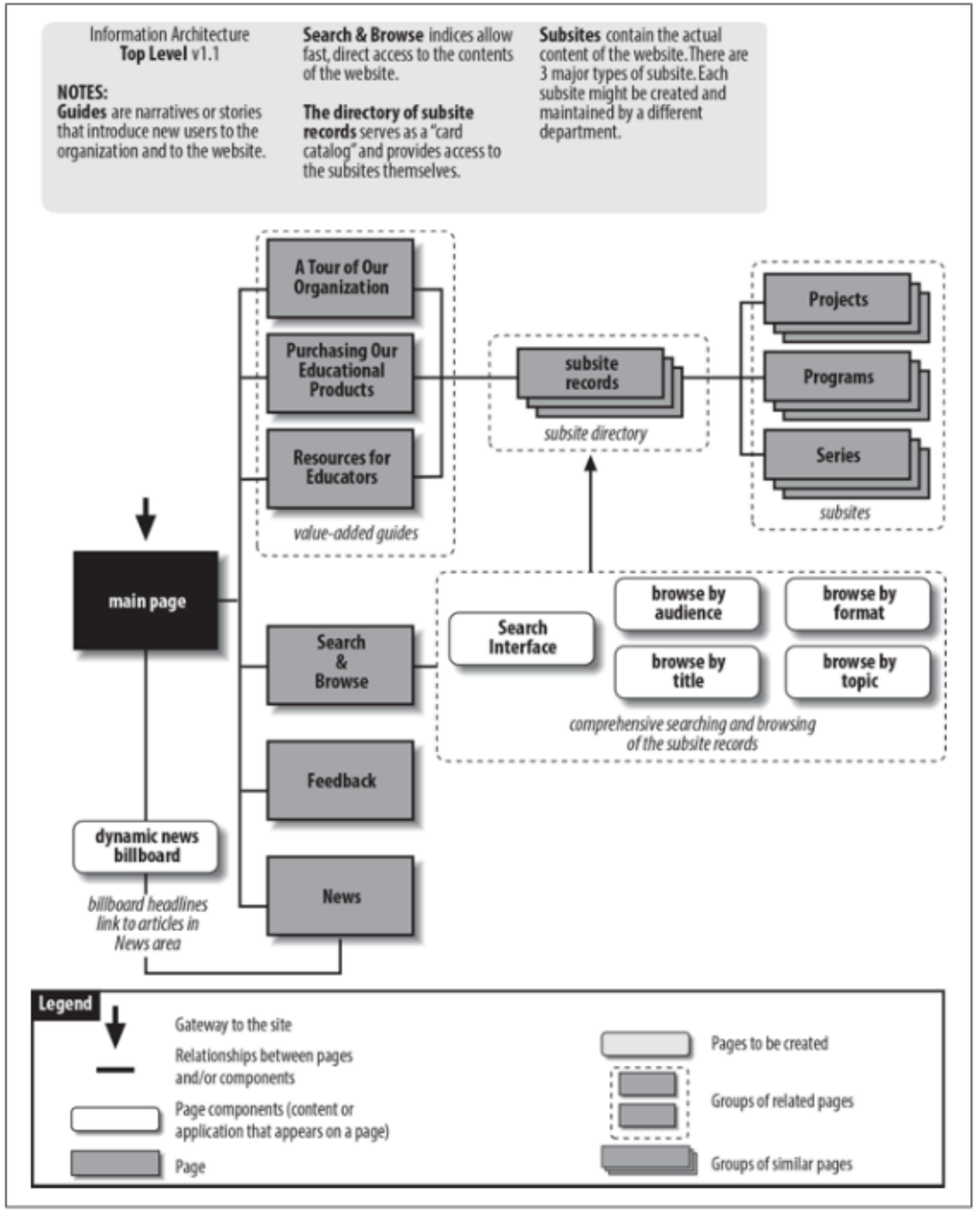


Figure 13-1. A high-level sitemap

Image from: Rosenfeld et al. Information Architecture - For the Web and Beyond, O'Reilly (2015)

Wireframes

Wireframes

➔ Wireframes depict how an individual page or template should look from a structural and architectural perspective.

➔ Wireframes forces to consider issues such as the location of navigation systems, the content hierarchy, content grouping, what to include and what to discards in each view of the system, etc.

➔ Wireframes are typically created for the system's most important pages or screens.

➔ They are also used to describe templates that are consistently applied to many pages.

➔ They are also a good way to explore the impact of different screen sizes on content layout.

➔ Wireframes can vary in their "level of fidelity", from low-level to high-level, depending on the stage of the development lifecycle.

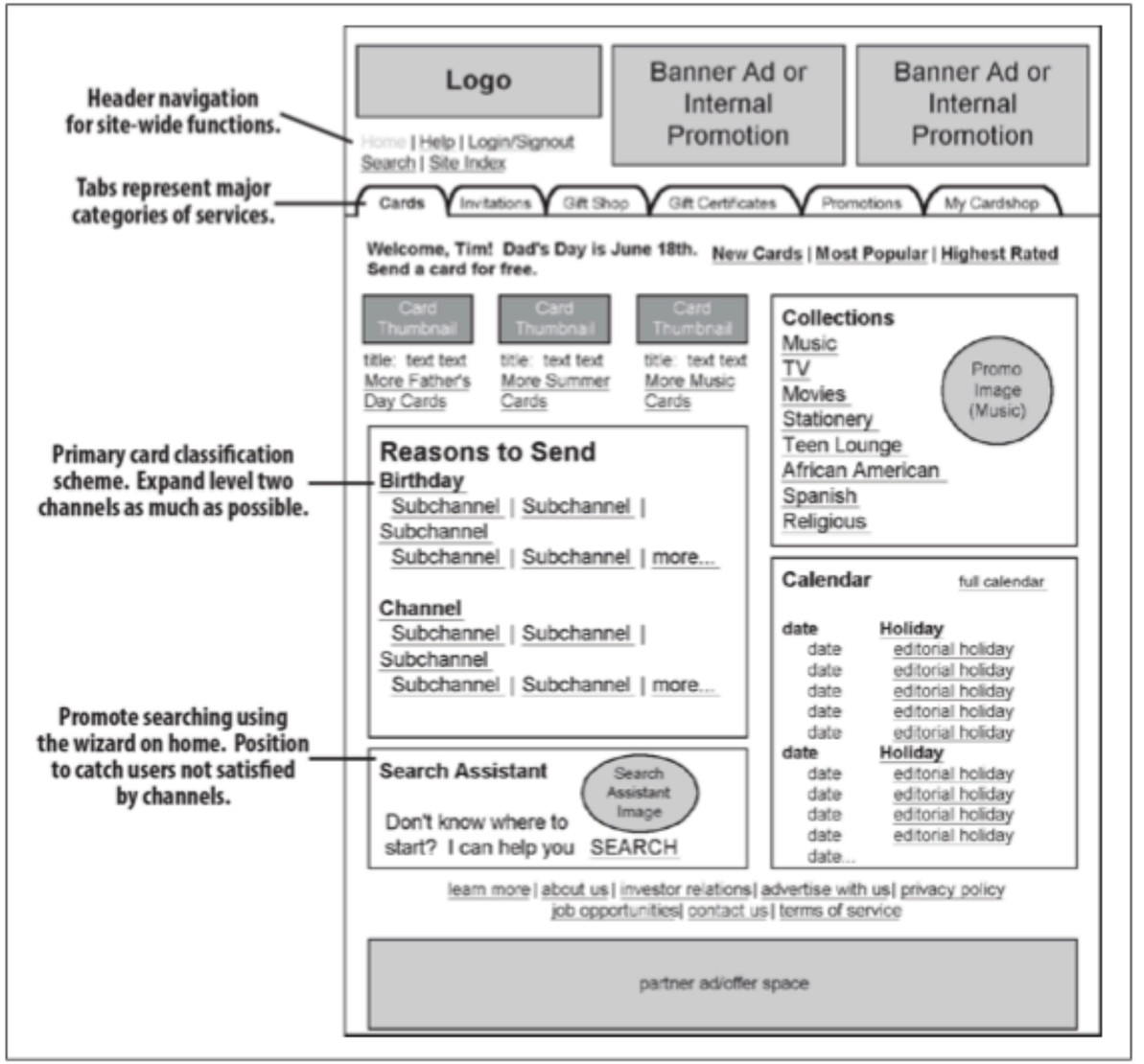


Figure 13-11. A wireframe of the main page of a greeting card site

Image from: Rosenfeld et al. Information Architecture - For the Web and Beyond, O'Reilly (2015)

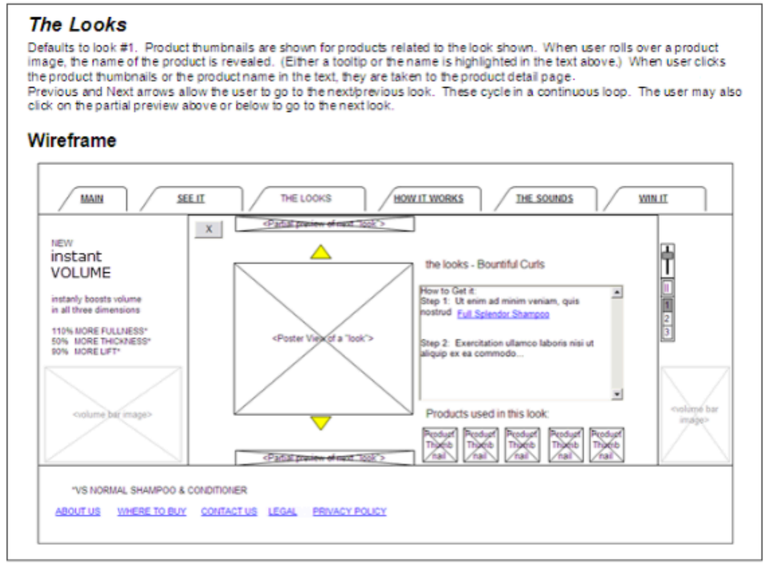


Figure 13-13. A low-fidelity wireframe; note that the focus is on layout of content and visual elements over content accuracy (wireframe developed for ProQuest LLC; reproduced with permission of ProQuest LLC—further reproduction is prohibited without permission)

Figure 13-14. A medium-fidelity wireframe by Chris Farnum and Katherine Root; more detail, more explanation, and more unique content (wireframe developed for ProQuest LLC; reproduced with permission of ProQuest LLC—further reproduction is prohibited without permission)

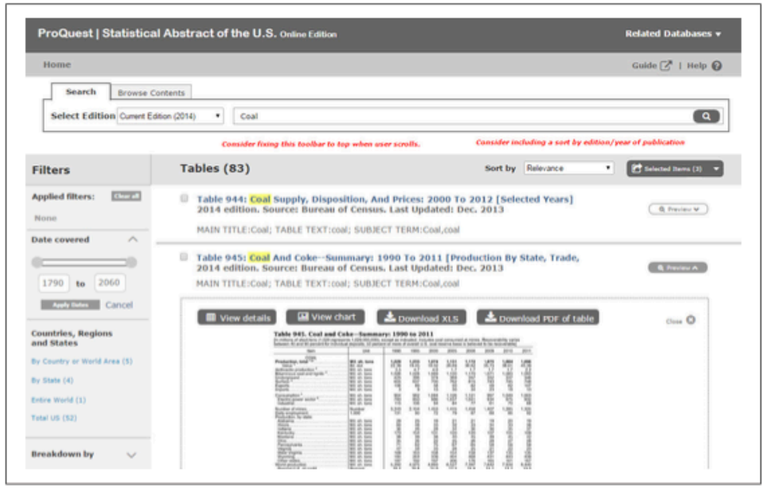


Figure 13-15. A high-fidelity wireframe (wireframe developed for ProQuest LLC by Chris Farnum; reproduced with permission of ProQuest LLC—further reproduction is prohibited without permission)

Images from: Rosenfeld et al. Information Architecture - For the Web and Beyond, O'Reilly (2015)

Wireflows

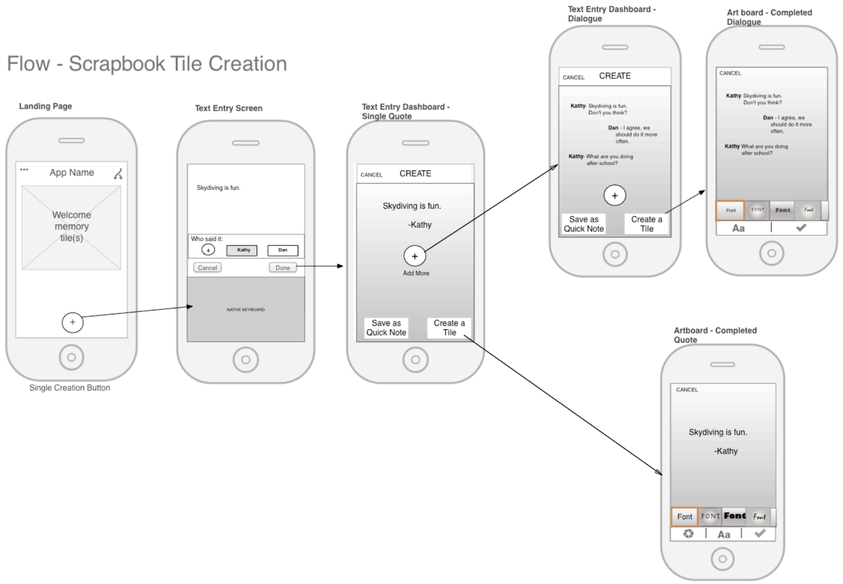
Wireflows

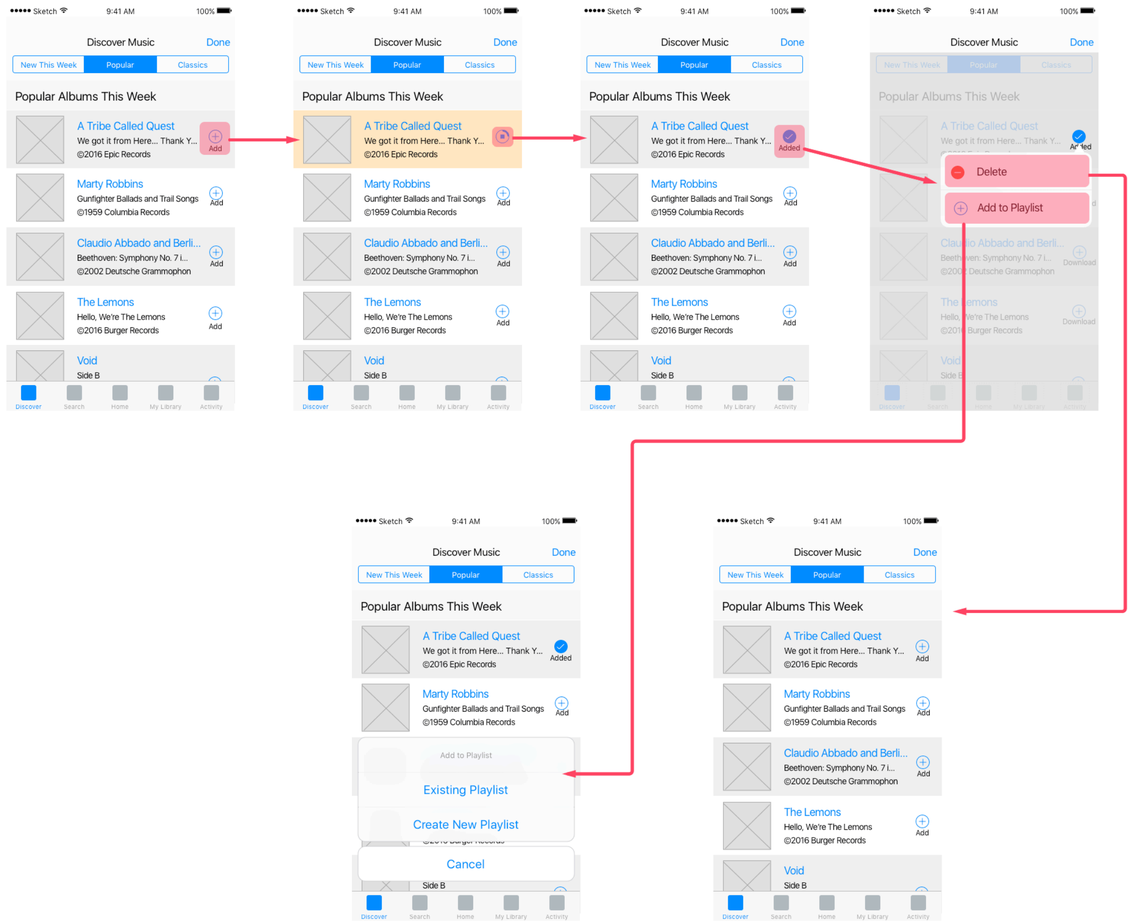
➔ Wireflows combine wireframes and flowcharts to provide both a view of page-level layout ideas (structure), and document complex workflows and user tasks (flux).

➔ Useful when documenting systems with few pages that dynamically change its content and layout based on user interaction. This is an increasingly common pattern, particularly in mobile applications.

➔ Wireflows document interaction.

Wireflows





Images from: Laubheimer P. Wireflows: A UX Deliverable for Workflow and Apps. Nielsen Norman Group (2015)

A3. Information Architecture

A3. Information Architecture

- The Information Architecture artefact presents a brief overview of the information architecture of the system to be developed, and has the following goals:
  - Help to identify and describe the user requirements, and raise new ones;
  - Preview and empirically test the user interface of the product to be developed;
  - Enable quick and multiple iterations on the design of the user interface.
- This artefact enables a brief exploration of the information architecture of the system to be developed, in particular the identification of the content, how it is organized and made available, and how it is presented.
- Includes two elements: sitemap and wireframes.

A3. Sitemap

➔ Overview of the information architecture from the viewpoint of the users.

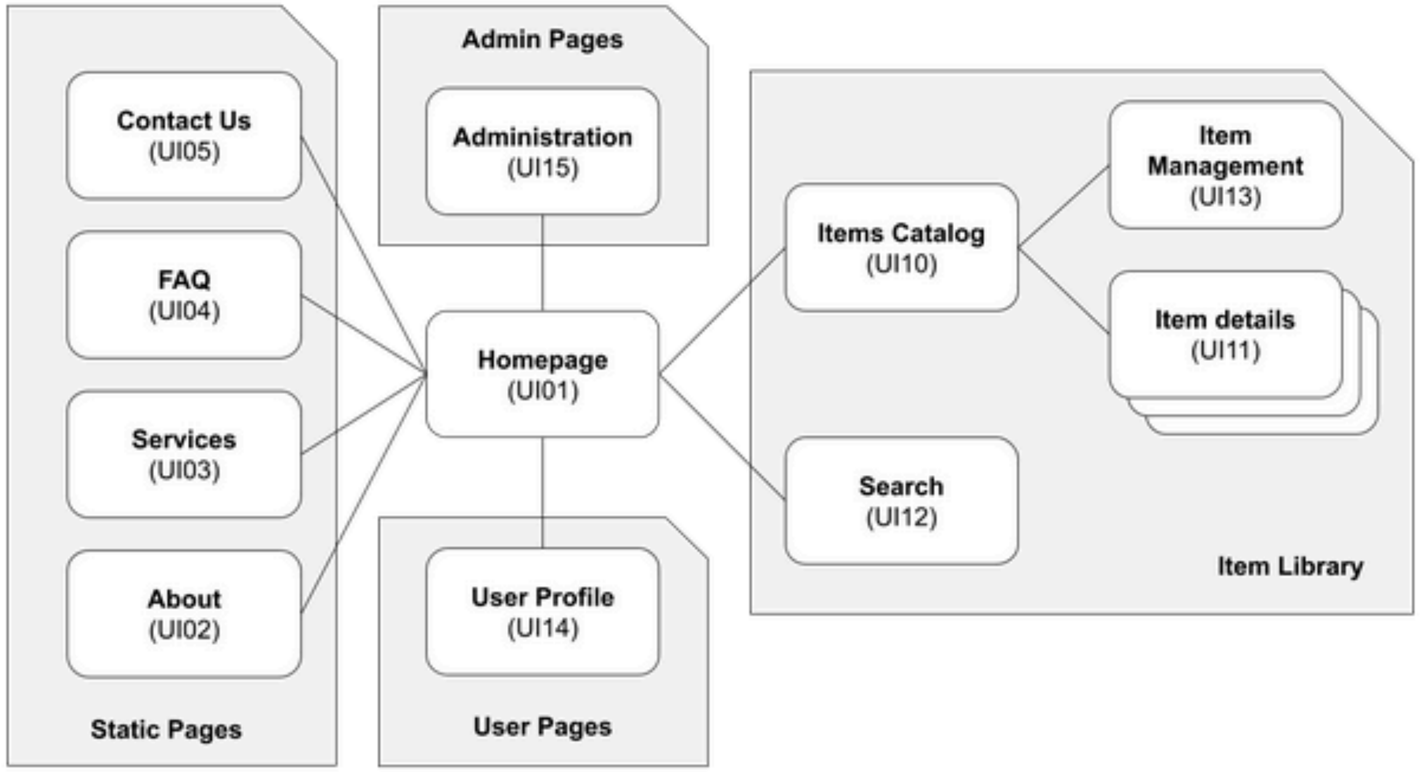


Figure 1: MediaLibrary sitemap.

A3. Wireframes

➔ Description and prioritization of the functionally and content of, at least two, main user interfaces.

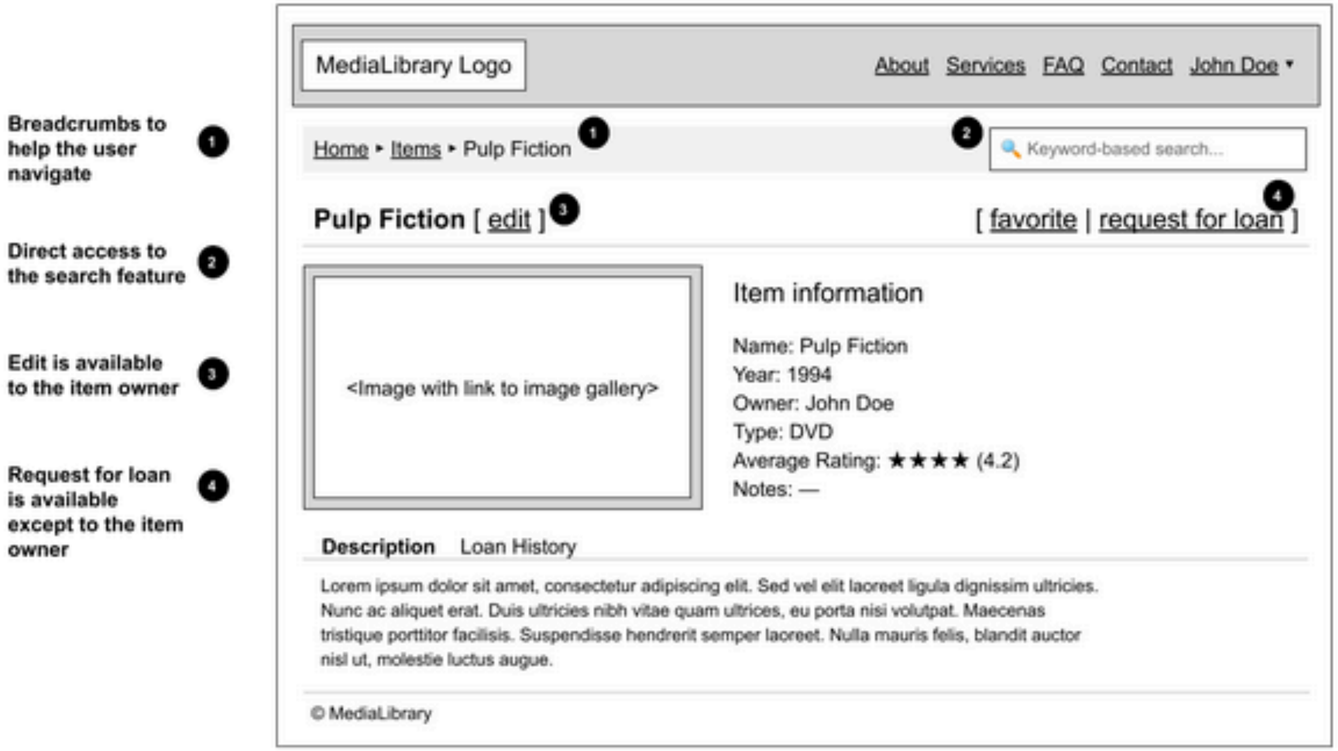


Figure 2: Item Details (UI11) wireframe.

A3. Checklist

A3. Information Architecture		
Artefact	**1.1**	The artefact reference and name are clear
	1.2	The goal of the artefact is briefly presented (1, 2 sentences)
Sitemap	**3.1**	The sitemap is included
	3.2	Standard notation is used (lines, boxes and stacks of boxes)
	3.3	The sitemap identifies pages, not functions or features
	3.4	Only main links between pages are included
	3.5	Home page is at the top/center
	3.6	Each page has a unique reference
	3.7	Login is presented as a page (may be a page element)
	3.8	Search results page is included
	3.9	About page is included
	3.10	View/Edit own profile is included
	3.11	Administration area and pages are included
	3.12	View project / View question / View post / etc is included
	3.13	View category / View tag / etc is included
Wireframes	**4.1**	Wireframes are included
	4.2	Basic graphical elements are used (i.e. simple lines, few colors)
	4.3	Wireframes are presented for at least two main screens
	4.4	For each wireframe, reference zones are indentified
	4.5	Headers and footers are included
	4.6	Navigation structures are included
	4.7	Page titles and headings are included

References

Online Resources

➔ A List Apart, https://alistapart.com

➔ World IA Days, https://www.worldiaday.org

➔ Nielsen Normal Group, https://www.nngroup.com

➔ Boxes and Arrows, https://boxesandarrows.com

➔ Smashing Magazine, https://www.smashingmagazine.com

Bibliography and Further Reading

➔ Information Architecture: The Design and Integration of Information Spaces. 2nd Edition. Wei Ding, Xia Lin, and Michael Zarro. Morgan & Claypool, 2017

➔ Information Architecture: For the Web and Beyond (*aka "Polar Bear" book*) . 4th Edition. Louis Rosenfeld, Peter Morville, and Jorge Arango. O'Reilly Media, 2015

➔ Everyday Information Architecture. Lisa Maria Martin. A Book Apart, 2019