

# Designing navigation for humans

## Principles for effective website information architecture

Dan Zollman

Design4Drupal, July 2023

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Good morning

I'm happy to be here at Design4Drupal

Thanks for coming

I want to thank Leslie and the other organizers for making this conference happen in person for the first time since 2019.

Organizing a conference is a LOT of work. (Pause)

My name is Dan Zollman, and I'm here to talk about information architecture. I've worked with a lot of people across disciplines who have voiced that they feel IA is important to their work, but they're not necessarily confident in talking about it. So my goal is to introduce you to a number of ideas that will help you think through information architecture problems. I did change the title slightly from techniques to principles because I think that will be a bit more meaningful.

# Applying for health insurance

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I'm going to start off with a little case study. It's a very exciting topic that should really energize us to learn about design and Drupal for the next two days...



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(Picture of Colin Robinson, a character from the TV adaptation of What We Do In The Shadows.)

# Applying for health insurance

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If you live in Massachusetts and don't have health insurance through an employer, there are a number of ways you can get it through the government.

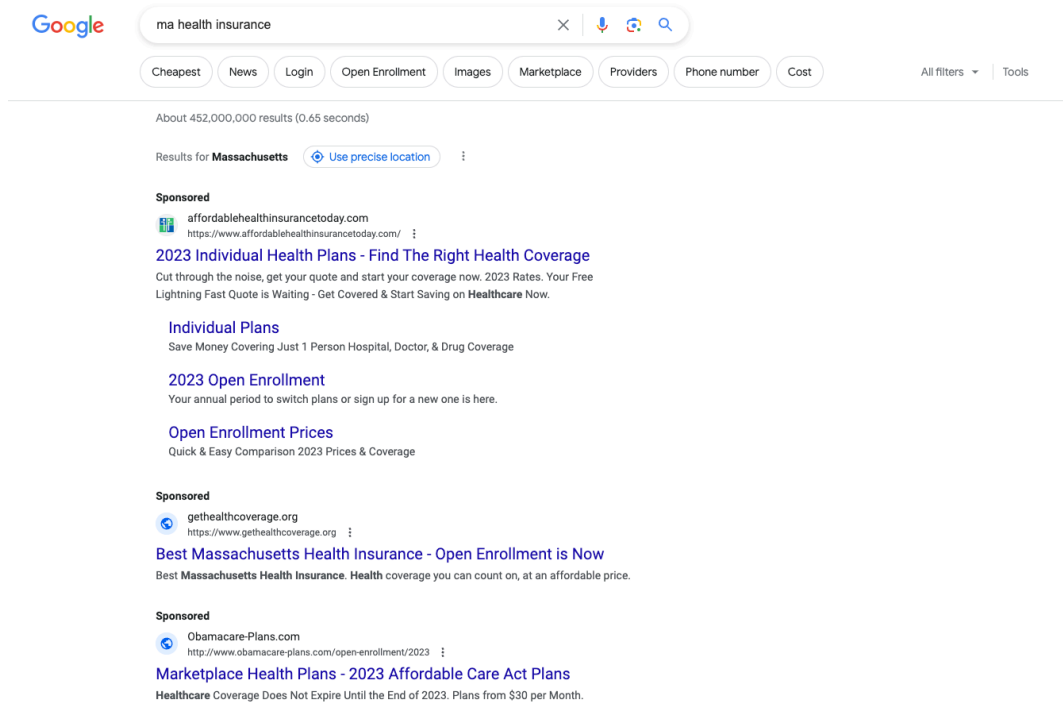
If you or a dependent meet certain criteria, you might be eligible for free or discounted health insurance. Even if you're not eligible, you can still get it through the state marketplace.

But like most government services, trying to get through their process can be confusing and frustrating.

If you've never done that before, you might not even know *if* insurance is available, what *kind* of insurance is available, or what to *call* it.

As a thought experiment, let's imagine how someone might look for that information online.

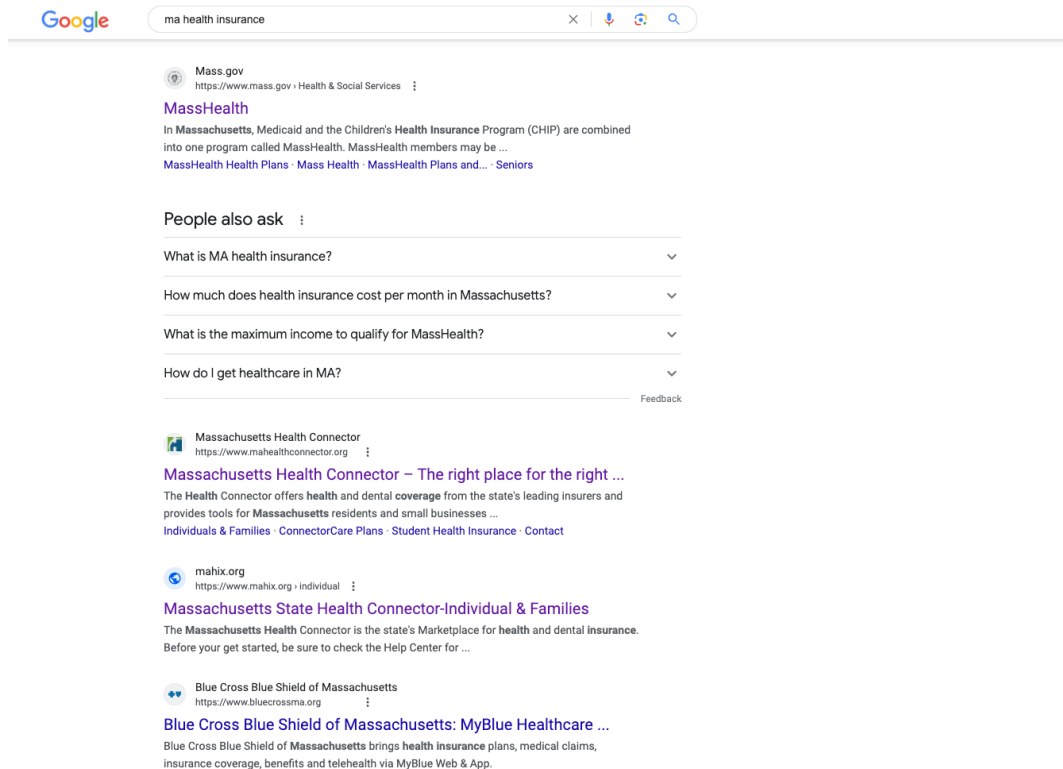




If you're like me, you start with a Google Search for "MA health insurance"

These are the results.

If you're savvy enough to ignore all of the scams and private insurance websites - which might not be true for everyone -



You'd scroll down and find three options.

The first one says MassHealth. Ah--that sounds like Massachusetts Health Insurance. That must be what I'm looking for, right?

But I also notice that there are two links both labeled Health Connector.

I've mapped out how I think the process would go from here, based on my first time doing it a few years ago. For the sake of brevity, I won't go through it step by step, but I'll give you a few highlights.

An official website of the Commonwealth of Massachusetts Here's how you know

Menu State Organizations Log In to...

Mass.gov Search Mass.gov

Health & Social Services

## MassHealth

In Massachusetts, Medicaid and the Children's Health Insurance Program (CHIP) are combined into one program called MassHealth. MassHealth members may be able to get doctors visits, prescription drugs, hospital stays, and many other important services.

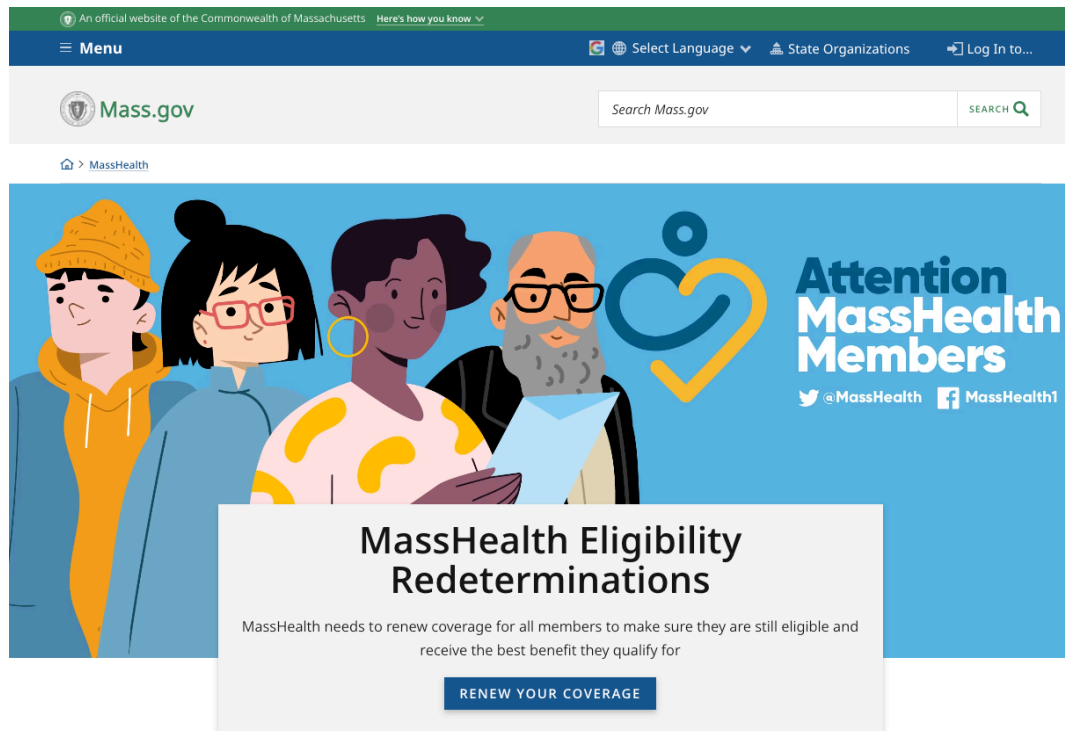
ALL MASSHEALTH MEMBERS NEED TO RENEW THEIR COVERAGE STARTING IN APRIL 2023. WE MAY CONTACT YOU VIA TEXT OR EMAIL ABOUT YOUR RENEWAL OR WITH OTHER IMPORTANT INFORMATION. WE WILL NEVER THREATEN YOU OR ASK FOR YOUR CREDIT CARD INFORMATION.

- MassHealth Eligibility Redeterminations
- Information for MassHealth Applicants
- Coronavirus Disease (COVID-19) and MassHealth
- Information for MassHealth Members
- MassHealth Health Plans
- MassHealth Initiatives
- MassHealth Provider Information
- MassHealth Publications
- MassHealth Resources

Feedback

First, if you click through to the MassHealth content on Mass.gov, there is a LOT of information to wade through. And yet, there doesn't seem to be anything here for someone who's new. If I dig through it...

<https://www.mass.gov/topics/masshealth>



I get to a page about renewing your insurance.

<https://www.mass.gov/masshealth-eligibility-redeterminations>

An official website of the Commonwealth of Massachusetts [Here's how you know](#)

Menu Select Language State Organizations Log In to...

Mass.gov Search Mass.gov SEARCH

Health & Social Services > MassHealth > MassHealth Health Plans

OFFERED BY MassHealth

## MassHealth Plans and Enrollment Guide

Members can learn about MassHealth plans and learn about the enrollment process.

**Notices & Alerts** Hide

**NEW:** MassHealth may contact you via text, email, or robocall about your renewal or with other important information about your health coverage. Updated May 1, 2023, 03:00 pm

Once you have been approved for MassHealth coverage, it's important to choose a health plan for you and your family! MassHealth provides health plans so members can get the health care they need. Learn about the plans that are available in your area, compare them, and then enroll in one.


If you are not already a MassHealth member, you must first apply for MassHealth coverage. Follow the "Non-members apply for coverage here" link to apply for coverage.

A page that tells me how to enroll in a health plan, but only after I've you've already applied and gotten approved.

<https://www.mass.gov/masshealth-plans-and-enrollment-guide>

An official website of the Commonwealth of Massachusetts [Here's how you know](#)

Menu [Select Language](#) [State Organizations](#) [Log In to...](#)

  [SEARCH](#)

[Home](#) > [Health & Social Services](#) > [MassHealth Health Plans](#) > [MassHealth Plans and Enrollment Guide](#)

OFFERED BY [MassHealth](#)

## Apply for MassHealth, the Health Safety Net, or the Children's Medical Security Plan

Find out who's eligible and how to apply for MassHealth, Health Safety Net, and the Children's Medical Security Plan

[Apply online by creating an MA Login account](#)

[Eligibility information](#)

### THE DETAILS

**What you need**

- [How to apply](#)
- [Next steps](#)
- [More info](#)
- [Downloads](#)
- [Contact](#)

**What you need**

To apply, you **may** need to provide the following information and documents:

- Social Security numbers, if you have them, for every household member who is applying
- Federal tax returns, if you file
- Information about citizenship or national status or immigration status

### CONTACT

**MassHealth Customer Service Center**

**Phone**

Main: (800) 841-2900  
Self-service available 24 hrs/day in English and Spanish. Other services available Monday-Friday 8 a.m.-5 p.m. Interpreter service available.

TDD/TTY: 711  
Self-service available 24 hrs/day in English and Spanish. Other services available Monday-Friday 8 a.m.-5 p.m. Interpreter service available.

ack

A page that tells me how to  
apply...getting warmer...

<https://www.mass.gov/how-to/apply-for-masshealth-the-health-safety-net-or-the-childrens-medical-security-plan>

An official website of the Commonwealth of Massachusetts [Here's how you know](#) ✓

Menu Select Language State Organizations Log In to...

Mass.gov Search Mass.gov

Health & Social Services > MassHealth Health Plans > MassHealth Plans and Enrollment Guide

OFFERED BY MassHealth

## Eligibility for health care benefits for MassHealth, the Health Safety Net, and Children's Medical Security Plan

Learn about health care eligibility requirements for individuals and families including people with disabilities.

Notices & Alerts Hide

NEW: MassHealth may contact you via text, email, or robocall about your renewal or with other important information about your health coverage. Updated May 1, 2023, 03:00 pm

To find out if you're eligible, you must fill out an application. You can learn more about how to apply to [MassHealth, the Health Safety Net, or the Children's Medical Security Plan](#) or for [seniors or those who need long-term-care](#). If you need completing the application, you can [find assistance in your area](#).

### Basic requirements for coverage

#### Residency

You must be a resident of Massachusetts to get MassHealth or other health care benefits that

RELATED

[Apply for MassHealth, the Health Safety Net, or the Children's Medical Security Plan](#) →

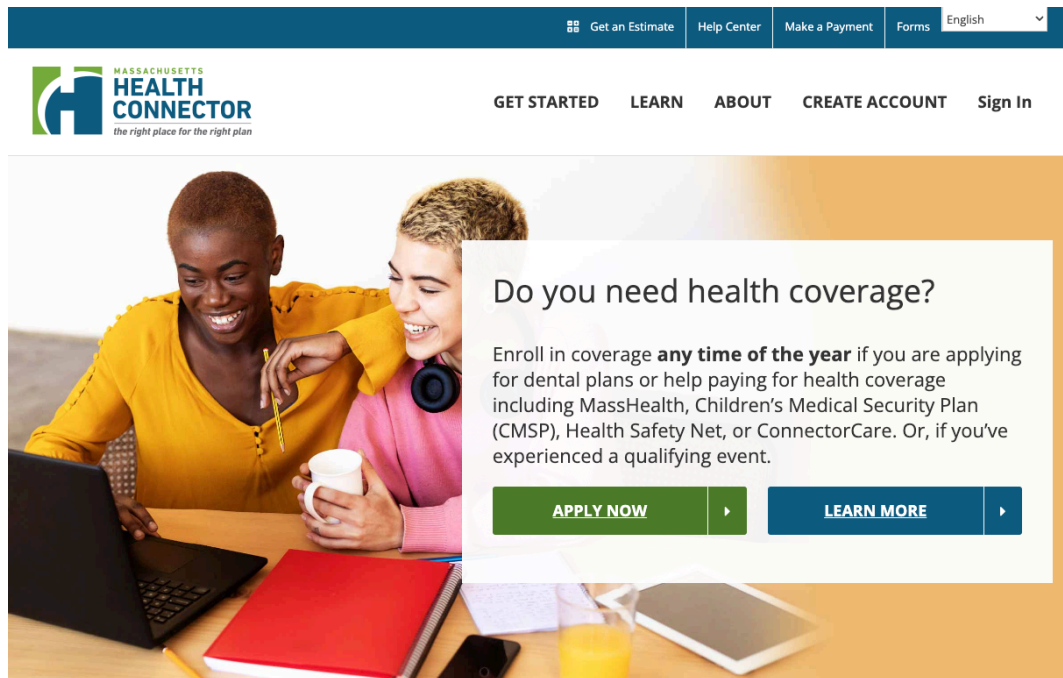
[Apply for MassHealth coverage for seniors and people of any age who need long-term-care services](#) →

[Applications to become a MassHealth member](#) →

And finally, there's a page that tells me about eligibility, which is what I really want to know. However, it tells me to actually apply in order to know if you're eligible, so it never clearly tells me whether this is even the right program to apply to.

And this whole time, there's no mention that this is only a subset of the available insurance options. There are others, and at minimum, everyone is eligible for insurance through the marketplace. This is pretty important.

<https://www.mass.gov/service-details/eligibility-for-health-care-benefits-for-masshealth-the-health-safety-net-and-childrens-medical-security-plan>



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The second link from that Google Search goes to a website called the Massachusetts Health Connector. This mentions a handful of programs, but it still doesn't clearly outline what is available to whom.

And then the "Apply" button takes me to that third site...

<https://www.mahealthconnector.org/>



[Learn More](#) | [Get Assistance](#) | [Accessibility](#) | [Language: English](#) ▼

   My Cart:0

Start your Application for  
**Health Coverage**

[Apply Now](#) ➔

**Sign In**  
Please sign in if you have an account.

[Sign In](#)

**WARNING**  
This system may contain Government information, which is restricted to authorized users ONLY. Unauthorized or improper use of this system may result in civil and criminal penalties. Your use of the system is subject to monitoring to detect potential fraudulent and abusive behavior. Such monitoring may result in the acquisition, recording and analysis of all data being communicated, transmitted, processed or

**See What You May Qualify For**

Your Zip Code

Coverage Start Date  
August 01, 2023 ▼

Do you want to check to see if you are eligible for help paying for costs? ⓘ


☒ Yes ☐ No

**Preview Health and Dental Plans and Prices**

Before you apply for coverage, you can see health and dental plans and prices available in your area. The premiums (costs of plans) you see do not include Advance Premium Tax Credits or other savings. You will need to fill out an application to see if you qualify for help paying for costs.

[Preview Plans](#)

[Important Dates](#)



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which is *also* called the Health Connector, and is confusing in its own way.

I'll stop here, but suffice it to say that getting health insurance in Massachusetts is not really an easy experience if you're not already familiar with how the system works.

<https://www.mahix.org/individual/>

## Contact MassHealth

Need assistance? You can schedule a video or phone appointment online with a MassHealth representative using the [MassHealth Appointment Scheduling Tool](#).

If you are a current MassHealth member and need to update your account, enroll in or change your health plan, need to choose your doctor, or have questions about your coverage, call the **MassHealth Customer Service Center** at

1-800-841-2900, or TTY 1-800-497-4648 for people who are deaf, hard of hearing, or speech disabled.

### Business Hours

- Monday–Friday: 8:00 a.m. to 5:00 p.m.
- Saturday: Closed
- Sunday: Closed

Self-service available 24 hrs/day in English and Spanish.

[Go to the MassHealth website for more information](#)

Let's say you manage to get registered for a health connector plan, but you get stuck later on in the process. So you call for help. But after you've waited on hold, the customer service rep can't help you. They can't find your account in the system. They don't know what happened to it.

The reason is that there are different phone numbers for the Health Connector and for MassHealth, but both sets of contact information are displayed on the same website. It's a reasonable conclusion to think that the name MassHealth describes the insurance you have, and then call that number, but that may not be correct.

## Why doesn't this experience work?

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The point of this is not just to go on a rant about the usability of government services, although I do think we should demand better from our state government.

The point is that this is instructive from an IA perspective.

One takeaway is that there was a failure to account for user needs.

**User task:**

What health insurance is available  
*to me?*

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At the beginning of this scenario, I hand't made a decision yet.

I just wanted to know what was available to me.

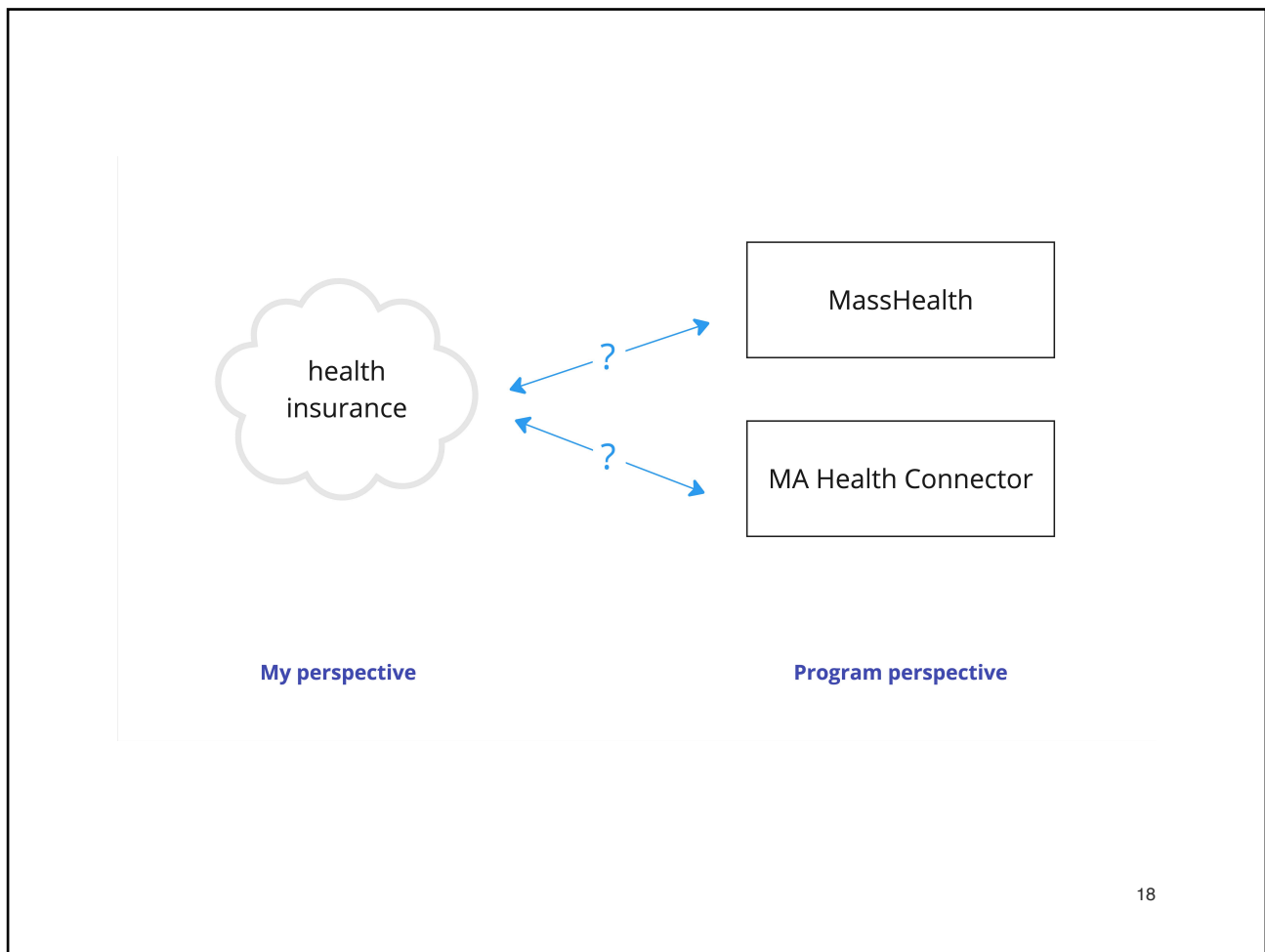
But

## User task:

What health insurance is available *to me*?

Much of the content I encountered required me to *already know* which government program I was interested in.

Much of the content I encountered required me to *already know* which government program I was interested in.



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But beyond that, there was a conceptual breakdown. My mental model was that I was looking for *health insurance*. What I found was organized in terms of programs or perhaps different government departments--MassHealth in one place and Health Connector in another place. Start with the program, and you get to the insurance later.

But even that is ambiguous.



MassHealth

MA Health Connector

Are MassHealth and Health Connector  
the only two programs?

MassHealth

MA Health Connector

Health Safety Net

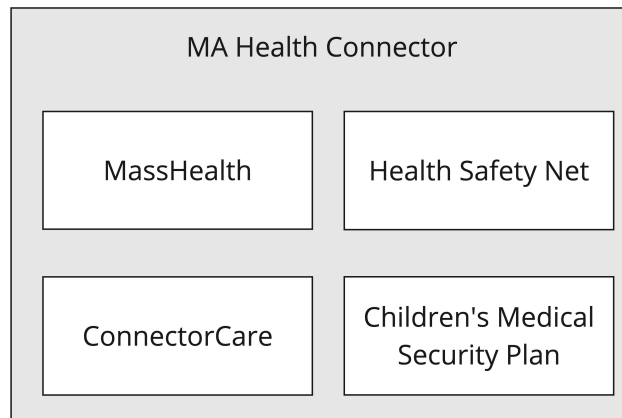
ConnectorCare

Children's Medical  
Security Plan

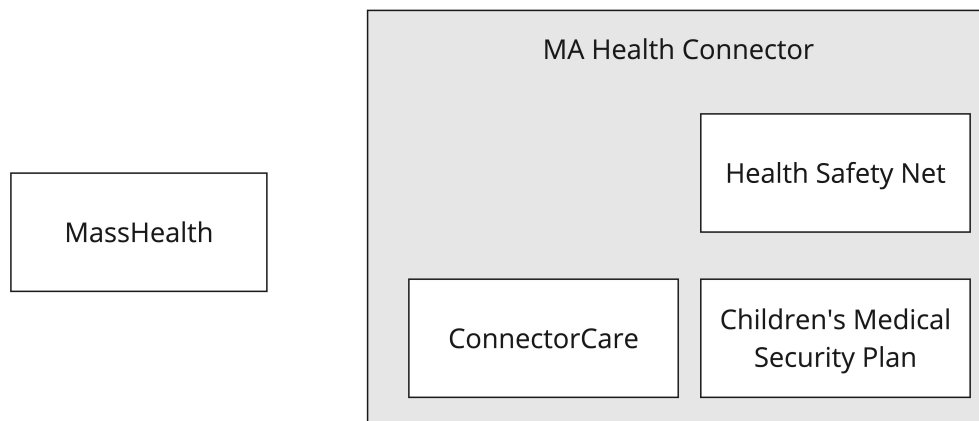
*Others?*

What all these other ones?

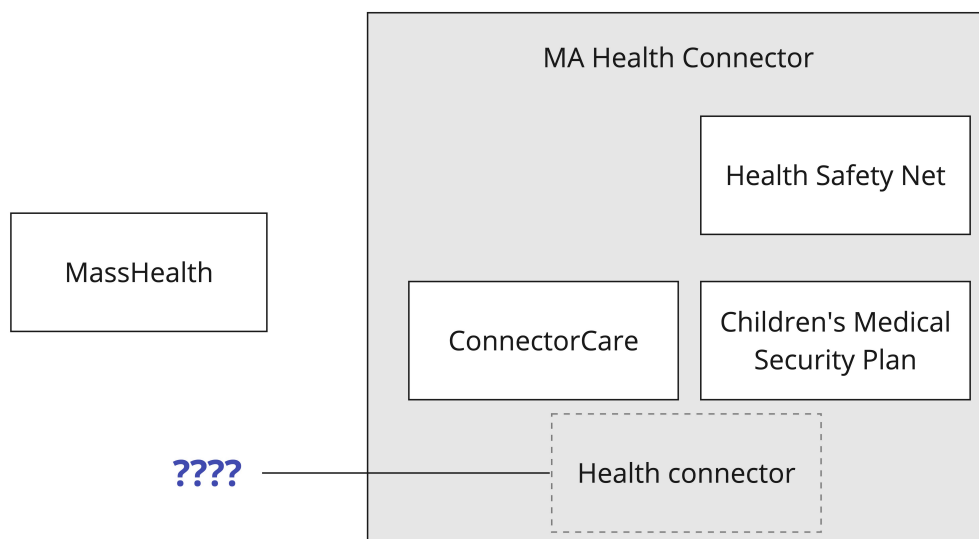




Is the Health Connector a kind of insurance, or is it just a container for all the others?



Is it a container for everything except MassHealth?



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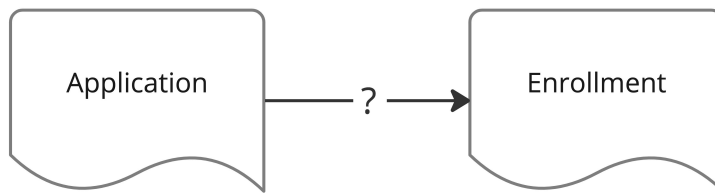
What about insurance from the marketplace? Is there a health connector inside the health connector?

The structure is never clear.

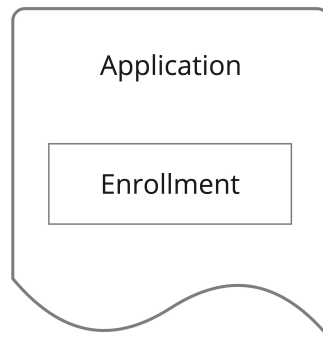
I want to stress that this isn't just an issue of labeling and writing a description of each program. It's a structural issue that's pervasive throughout the online experience.



Here's another example. I have an application and an enrollment. Why are they two things?



Are they steps in a process?



Does the application contain the enrollment?



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Once I've finished enrolling, why do I still have an application?

Again, this is not just about labeling. This goes deep into the data models and functionality of these systems.

Ambiguous

Clear

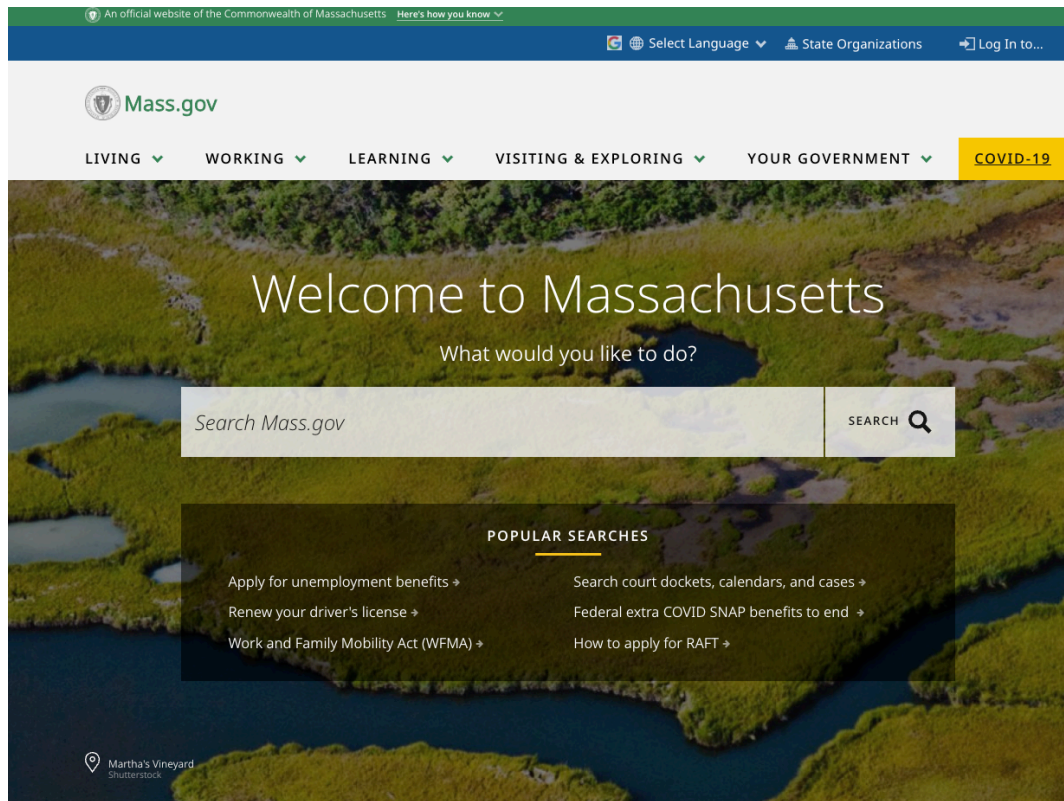
Unstable

Consistent

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Whatever the right conceptual models is,  
it isn't *clear*, and it isn't applied  
*consistently* throughout the experience.





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As many of you know, Mass.gov is famously built on Drupal.

It is built with an extremely high level of design, usability engineering, technical infrastructure, and a toolkit of thoughtfully built content types and templates.

## THE DETAILS

### What you need

### How to apply

### Next steps

### More info

### Downloads

### Contact

### What you need

To apply, you **may** need to provide the following information and documents:

- Social Security numbers, if you have them, for every household member who is applying
- Federal tax returns, if you file
- Information about citizenship or national status or immigration status
- Employer and income information for everyone in your household (for example, from paystubs or wage statements)
- Information about any job-related or other health insurance that you are currently enrolled in or have access to

### Who can use this application

A huge amount of thought goes toward making sure content is written in plain, step by step language that most Massachusetts residents will be able to follow.

But you can have great UI design, great software, and you can make sure the content is perfectly written on every individual page...and the system still isn't usable without effective navigation and a strong conceptual structure.

# IA is not easy.

- Not as visible as other design & dev work
- Reduced to menus
- Determined by guessing
- Determined by org structure & politics

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This is not easy.

It's easy to get tied up in more visible aspects of UX design and development, and lose sight of how things fits together.

When we do talk about IA, it gets reduced to navigation menus.

We might end up making guesses. Or we let organizational politics define IA.

And we know that's a problem because users don't think about your organization the way you think about it internally. **They don't know enough about you to understand how you're organized.**

# **We build environments in which people live and work**

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It's important to recognize that we are not just building interfaces. We build environments in which people live and work and interact every day. We live in information. The architecture matters.

(For an exploration of this, see the book *Living in Information* by Jorge Arango.)

# Towards better information architecture

1. Understanding *how humans navigate*
2. Attending to *conceptual structure*
3. Considerations for navigation menus

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I'm going to talk about three main topics that you can use to help think through navigation and IA problems.

We'll start by looking at how humans navigate, and this knowledge can help us build better websites.

Then we'll get into the idea of conceptual structure, and how to do concept modeling before translating that to navigation design.

A quick bit about me:

# Dan Zollman

Independent consultant in  
Cambridge, MA

Information architecture & UX  
strategy

Responsible & ethical design

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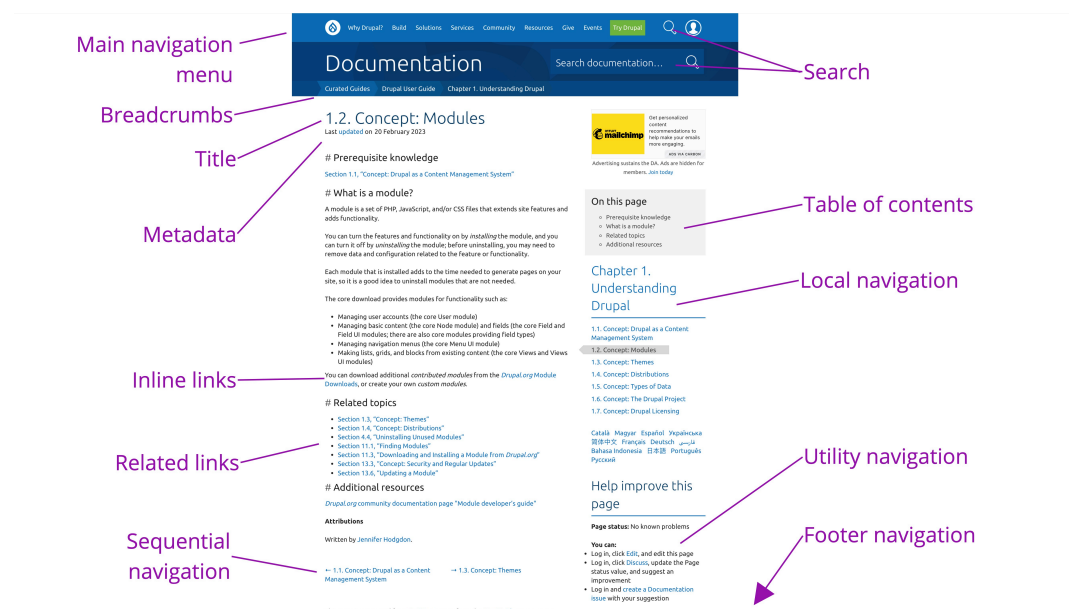
My name is Dan Zollman. I'm an independent consultant specializing in information architecture and UX strategy. I've also spend a long time doing IA/UX in-house at places like Vanguard, Tufts University, and the state of Massachusetts.

Apart from IA, I'm very interested in topics like theory of design, systems thinking, and responsible & ethical design. I won't be talking about those right now, but I'm happy to chat later.

# **Part I: How humans navigate**

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When we talk about navigation, we're often talking about parts of a website - things like menus and links.



There are *many* aspects of a website that support information seeking.

Not just menus, not just search.

All of these are part of the website's navigation system.

I want us to shift that mindset for a moment. I'm doing to borrow a bit from another IA theorist, Andrew Hinton. He said:



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*"Navigation is not a menu on a screen. Navigation is what people do."*

– Andrew Hinton<sup>1</sup>

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1. Andrew Hinton, "What We Talk About When We Talk About Navigation", IA Summit 2019. Used with permission.

You're navigating when you're looking for information on the website. But I'm also navigating when you're just scrolling on social media, when you read about something, when you ask someone else to explain something to you.

When I'm trying to get health insurance, I'm navigating regardless of whether I'm clicking on a menu or calling up customer service for help.

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*"My health insurer's website just had a big update that made it a lot more navigable...that's great!*

*But **what it does NOT do is help me navigate the broader system more effectively** - it doesn't help me find my way, translate between divergent meanings, or interact with other entities very well."*

– Andrew Hinton<sup>1</sup>

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1. Andrew Hinton, "What We Talk About When We Talk About Navigation", IA Summit 2019. Used with permission.

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*"We say 'navigate', but we really mean 'understand'."*

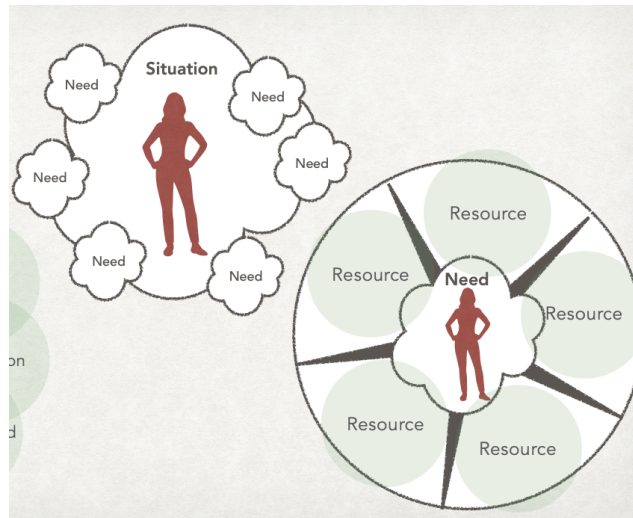
– Luca Rosati & Andrea Resmini <sup>1</sup>

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1. Rosati & Resmini (2011), *Pervasive Information Architecture*. As paraphrased by Andrew Hinton.

Andrew says "navigation is a handy label for humans perceiving and acting in an environment so as to understand what it is, how it works, and where to acquire the resources each human needs." [same source]

People use all of the resources in their environment to help them navigate.



*Source: Andrew Hinton, "What We Talk About When We Talk About Navigation", IA Summit 2019.*

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AH describes how navigation is associated with a person in a particular situation, with particular needs, seeking the resources to meet those needs. (diagram)

We can build better ecosystems by understanding what those situations are, what the needs are, and what resources should be available.

**Navigation => Understanding**

but..

**Just having the information isn't  
enough for people to find it.**

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So to summarize, navigation is about using the resources around you to understand.

But, let's take that a step further.

Just having the information doesn't mean people will find it.

We can't just add a search field and call it done.

# **Information seeking behaviors**

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Human information seeking behaviors have been a topic of study in relation to computer systems since the 1960s.

Marcia J. Bates is one important scholar whose work has been highly influential in the world of information system design over the past five decades, starting with her early research on how people search in library catalogs.

# Berry-picking model (Marcia Bates) <sup>1</sup>

1. Bates, M.J. (1989). The design of browsing and berrypicking techniques for the online search interface. *Online Review*, 13(5), 407–424. Also in: Marcia J. Bates (© 2016), *Information Users and Information System Design, Selected Works*, vol. 3, pp. 195-216.

One of Bates's best known ideas is the berrypicking model of information seeking.

Earlier theories stated that a user starts with an certain goal, and simply keeps searching until they find the information they want.

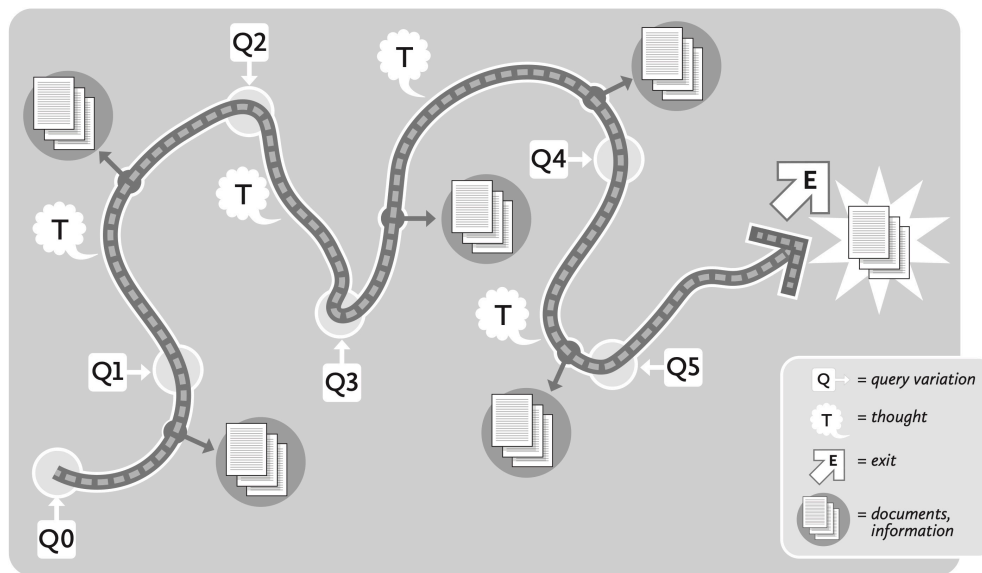


FIG. 2. A berrypicking, evolving search

In the berrypicking model, a user starts with an initial query and they get an initial result. They might save a little information, but it wasn't exactly the result they wanted, so they try again with a different query. Then a new thought or idea comes to mind, which sends them in a different direction. They continue on this semi-improvised pathway, gleaning different pieces of information along the way.

The berrypicking model shows that people don't just start with a goal in mind and then satisfy it. They use a wide variety of techniques at different points in time, with an evolving goal, and all of these techniques work together to help people navigate successfully.





**Exploratory** ↔ **Known-item**

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Navigation ranges from exploration without a concrete goal in mind, to known-item searches where you know you are looking for a very specific thing.

## **Modes of information seeking (Donna Spencer) <sup>1</sup>**

1. Exploratory
2. Known-item
3. Don't know what you need to know
4. Re-finding

1. Donna Spencer, "Four Modes of Seeking Information and How to Design for Them", in Boxes and Arrows. March 14, 2006. <https://boxesandarrows.com/four-modes-of-seeking-information-and-how-to-design-for-them/>

Donna Spencer describes how sometimes you just don't know what you need to know.

Think about someone visiting your organization's website. What would their experience be if they don't know what they need to know?

There are also situations when you need to find something you've seen before (refinding).

Maybe you don't remember exactly what it is or how to get back to it. What clues would you be looking for to help you remember?

Hi Daniel ▾ Daily Deals Brand Outlet Help & Contact Sell Watchlist ▾ My eBay ▾

**ebay** Shop by category ▾  All Categories  Advanced

Home Saved Motors Electronics Collectibles Home & Garden Fashion Toys Sporting Goods Business & Industrial Jewelry & Watches eBay Live Refurbished

**Enjoy up to 60% off this summer**

Get top-notch deals, plus a one- or two-year warranty.

**eBay Refurbished**

Spend smarter and save even more with our Spending and Savings accounts.

**ally** Member FDIC

Ally Bank, Member FDIC.

**Your Recently Viewed Items**

\$6.47

\$9.24

\$129.34

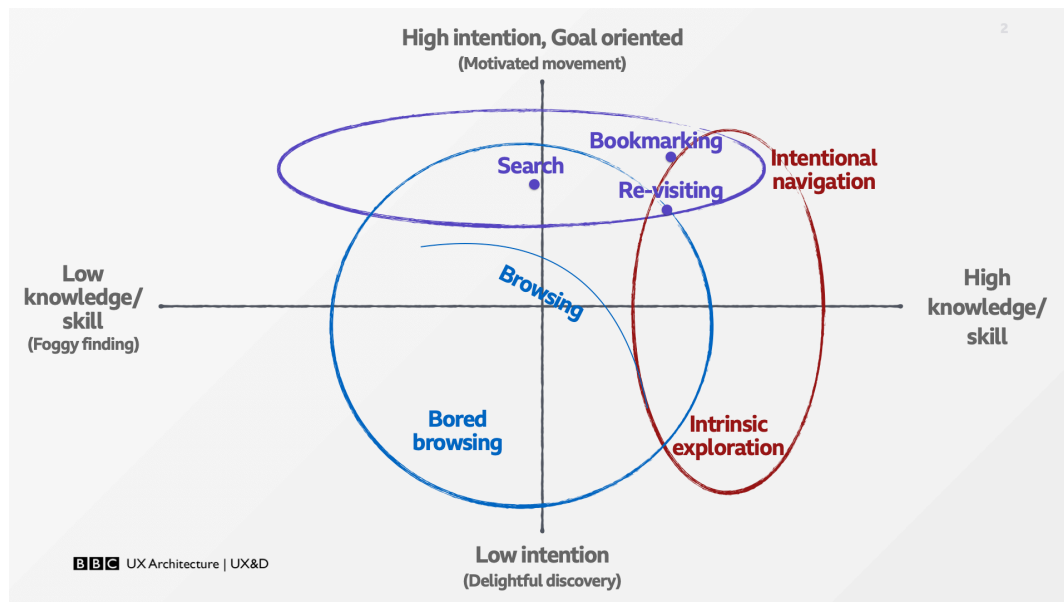
\$9.19

\$5.14

\$4.09

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Think about how a website can have a mix of functionality and UI patterns that help in situations where you're looking for a specific item, or you're just exploring, or you're trying to pick up where you left off yesterday.



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Dan Ramsden, information architect and creative director at the BBC, describes how behaviors range in the level of intentionality or motivation. Browsing around a used bookstore just to see what piques your interest is a lot different than looking for a cookbook that has a specific recipe.

People also vary in the amount of context and knowledge they have about the topic. This affects the strategies they use, and the language they will use to express what they want.

## **Modes of information seeking (Dan Ramsden) <sup>1</sup>**

1. Motivated movement
2. Delightful discovery
3. Foggy finding
4. Not necessarily navigation

1. Dan Ramsden, "A model for navigation and information-seeking". See <https://danramdsen.com/2017/01/27/model-navigation-information-seeking/> and the four linked pages.

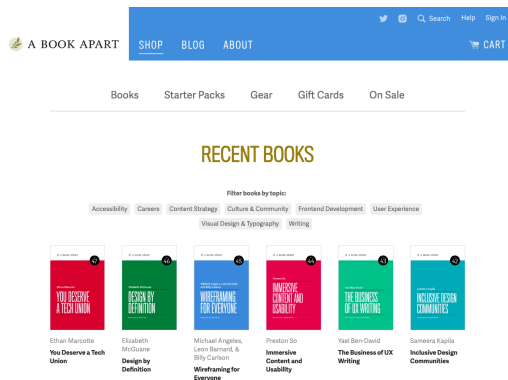
Dan Ramsden creatively defines his own four modes, which are subdivided into 12 behaviors.

I'd encourage you to check out these resource on his website. I especially like the metaphor of "foggy finding" to describe how sometimes you don't always understand what you're doing when you're navigating unfamiliar territory.

Again, each of these is supported by different features and design patterns in the user interface.

Information seeking behaviors are affected by:

- UI affordances
- Discovery
- Recognition over recall



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The UI affects what strategies you can or can't use.

The information you see along the way changes what you do by telling you what's available.

It make you aware of something you didn't know you were looking for.

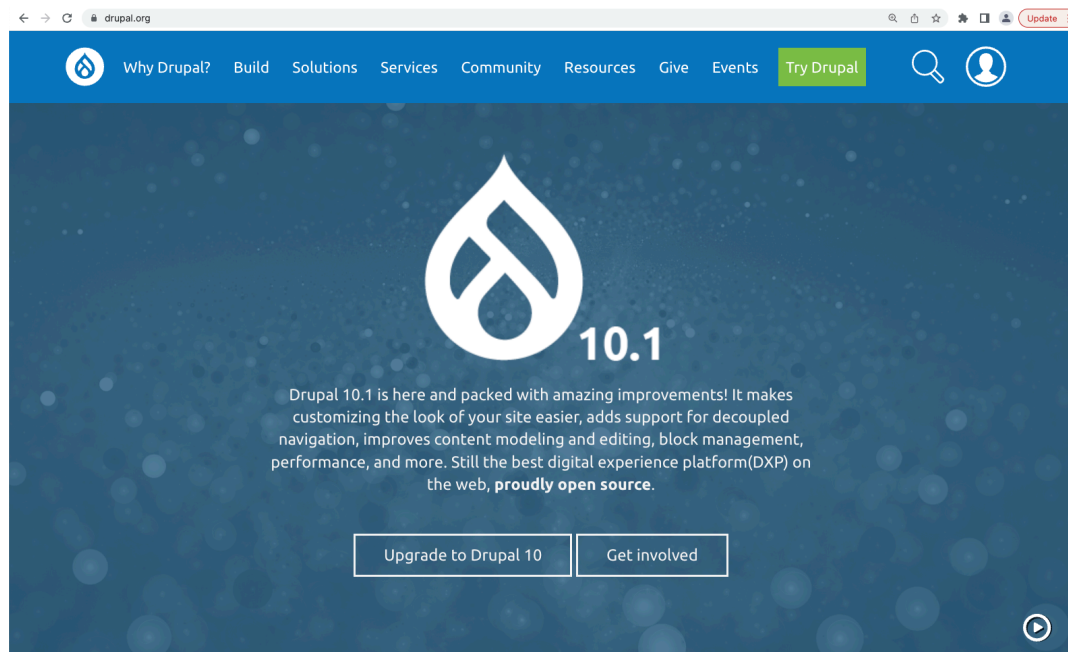
Seeing a menu of options to choose from is easier than trying to remember the a specific phrase to search for. (That's the psychological principle of recognition over recall.)

# **Information scent**

(Information foraging theory)

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The idea of information scent comes from a model called information foraging theory.

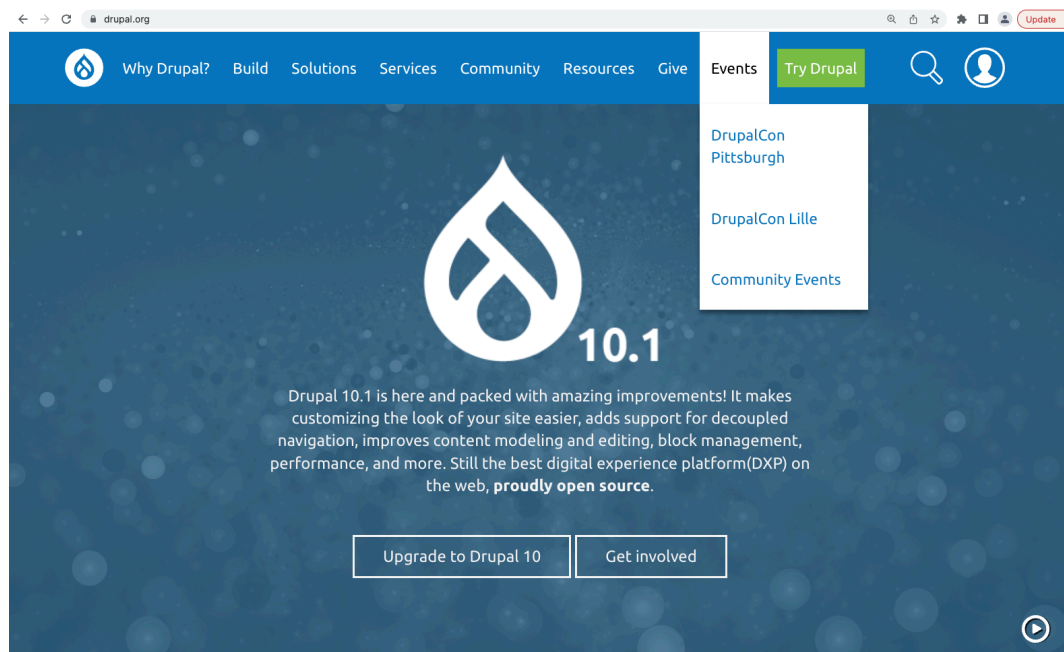


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The idea behind information scent is that if you're looking at a set of options, you look for the cues that look like they will get you *closest* to the thing you actually need.

It's okay that DrupalCon isn't one of the links in the main menu, because "Events" carries the information scent of a conference.





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This is specific to the audience, because words carry different connotations for different people.

This is something to think about in the way you categorize content and the way you label it.

Information scent can help people find information, but it can also mislead someone and send them down the wrong path.

MassHealth had the right information scent even though I really needed the Health Connector.

(More about information scent:

<https://www.nngroup.com/articles/information-scent/> )

# Perceiving and **acting**

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Now, we've talked bit about how people seek information and use the resources the encounter to help them move from one step to the next.

I want to go back to the idea that all of this takes place in an *environment*.

Remember Andrew's statement that navigation involves both perceiving and acting.

Moving through an environment.

Sometimes we need to be aware of that environment in order to move through it.

If you're at the art museum, you go from one painting to the next, reading the signs to help you along. But sometimes you'll stop and say, which room am I in? Am I in medieval art? How do I get to modern art?

Note: This view on navigation in an environment, as represented by Andrew Hinton, is derived from the field of ecological psychology (e.g. JJ Gibson).

# Wayfinding

1. How people orient themselves and navigate from place to place
2. Systems in the built environment (e.g. signage) that enable wayfinding

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Wayfinding refers to...

We may use maps from time to time to orient ourselves and to plan our route. But when we start moving, we're experiencing ourselves in relationship to the environment around us, making decisions about where to go from one moment to the next. *Oh, I remember that the registration desk is **that** way.* We may take a different route than the one we plotted on the map. That's wayfinding.

Similarly, to navigate a website, you don't normally look at a sitemap. You look at the page you're on and the cues that tell you where you are and what kinds of spaces are available to you.

## Wayfinding on websites <sup>1</sup>

- Where am I now?
- Where can I go?
- What will I find when I get there?
- What's nearby?
- How do I get out?

1. <https://ux.iu.edu/writings/wayfinding-systems/>

We look for answers to these questions in everything we see on a web page: page titles, headings, navigation menus, breadcrumbs, calls to action, imagery, colors, and so on.

# Part I Recap: How humans navigate

- Navigation => **Understanding**
- Provide support for a mix of **information seeking behaviors**, including situations where people *do* and *don't* know what they're looking for
- Support **wayfinding** by making the structure visible

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- Navigation is about understanding. That includes using all of the resources available in the environment.
- We want to design for a *range* of information seeking behaviors.
- We want to design for wayfinding by providing cues that help people through the spatial digital environment.

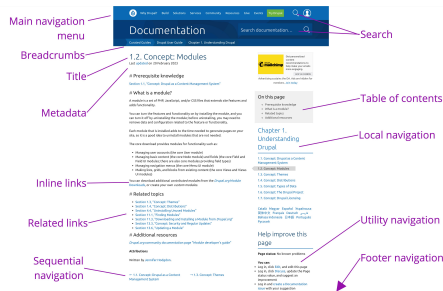
# **Part II: Conceptual structure**

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We've talked about some of the human needs that need to be met. How do we actually design an environment that works for people?

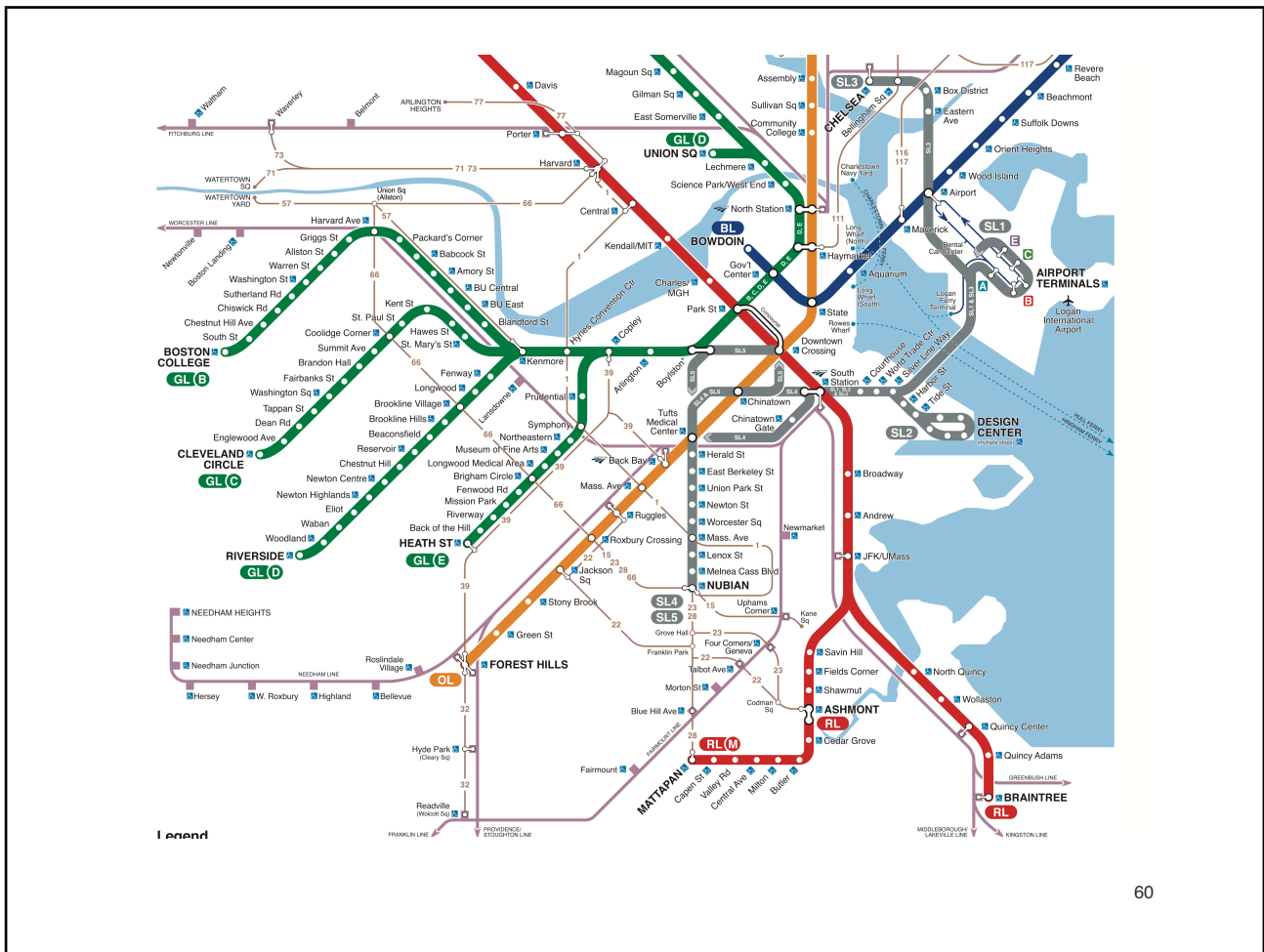
## Navigation systems help to:

- Make structure visible
- Support wayfinding
- Communicate what is available



As we've seen, menus, breadcrumbs, and many other elements are all part of a website's navigation systems. They help to meet the needs we just talked about.

But the underlying conceptual structure of a system goes deeper than menus.

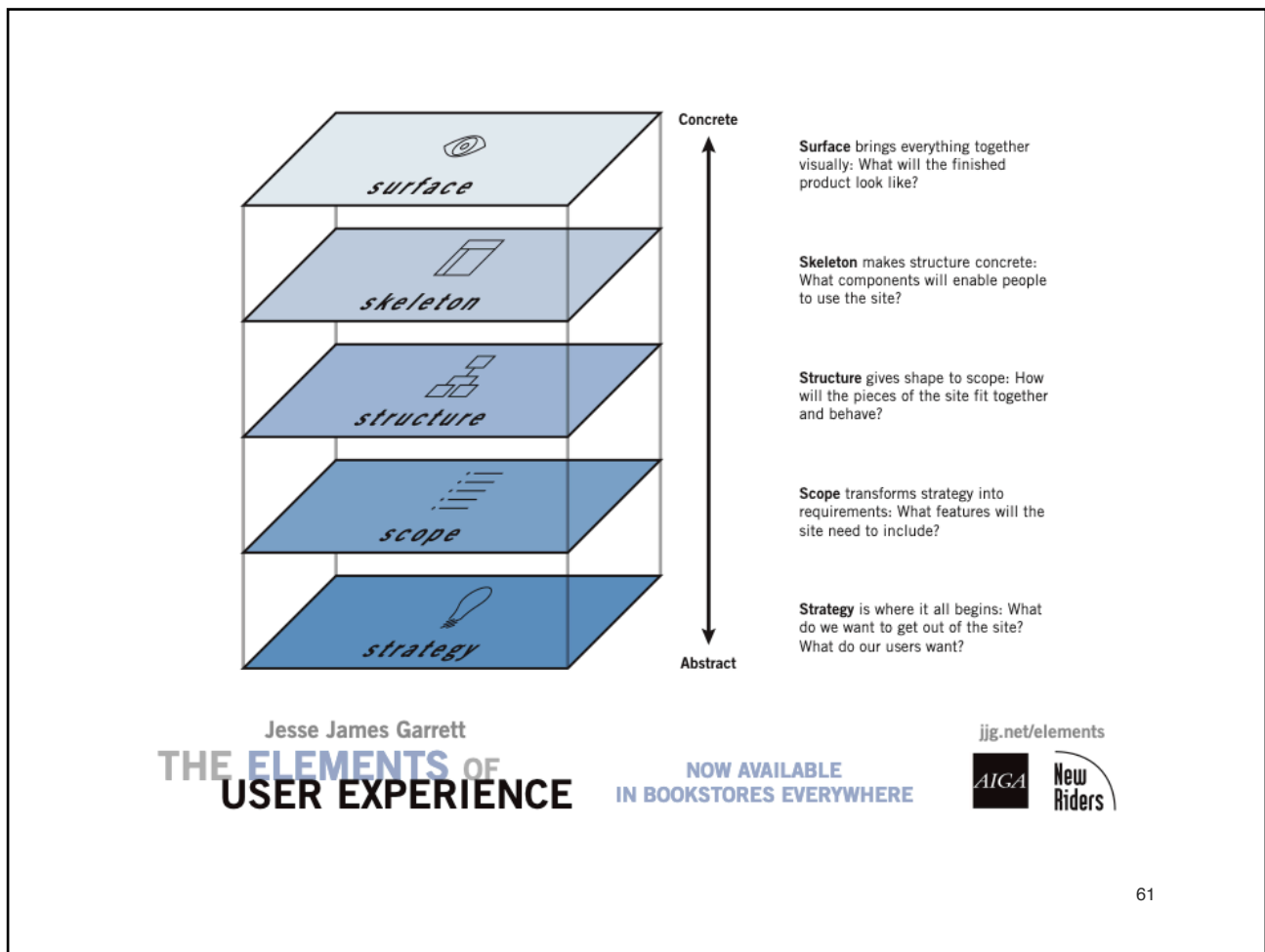


As an analogy, a subway map tells you where you are, where you can go, and which subway stops are connected to which stops. But it doesn't tell you everything you need to know about navigating the city. If your goal is to take the T to see some historic architecture, you need to know something about the neighborhoods you're traveling through. And it also doesn't tell you that it's a five minute walk from Downtown Crossing to State, but a 12 minute walk from Mass Ave to Back Bay, because the map intentionally has a distorted scale.

The subway map is a navigation system with a specific purpose that helps you travel within a complex territory.

Image: Map of the MBTA transit system.



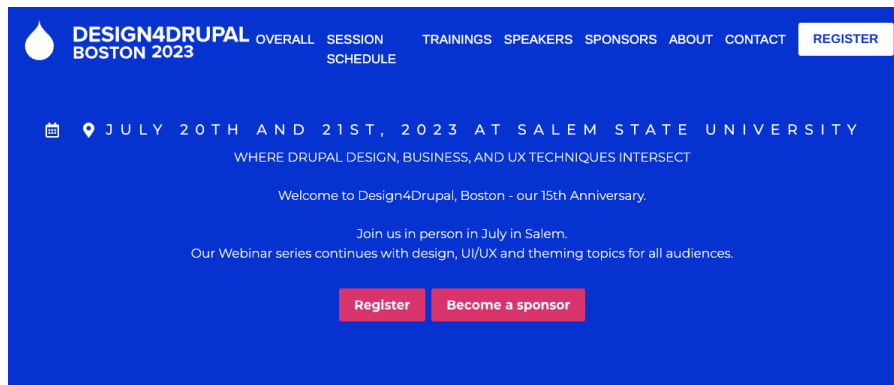


Jesse James Garrett illustrated how there's a similar relationship on a website.

All of the menus and navigation elements in the UI are part of the surface and skeleton, but there's still a need to design the underlying conceptual structure.

Image: Diagram showing 5 stacked planes. From top to bottom: surface, skeleton, structure, scope, and strategy.

Source: Jesse James Garrett, "the simple planes poster". <http://jjg.net/elements/>



## 2023 Keynote - Sheng-Hung Lee

### Design for Longevity (D4L): Service Innovation through System Thinking

People now not only live longer but also want to be healthier when they age due to more advanced emerging technologies, socioeconomic changes, education platforms, healthcare systems, and other socioeconomic factors. But what does longevity mean for designers and design leaders? The concept of design for longevity (D4L) has recently played a critical role in our society. D4L is not about adding labels for older adults on the products we design. D4L is also not only talking about how the new fabrication technologies can make the material last longer.

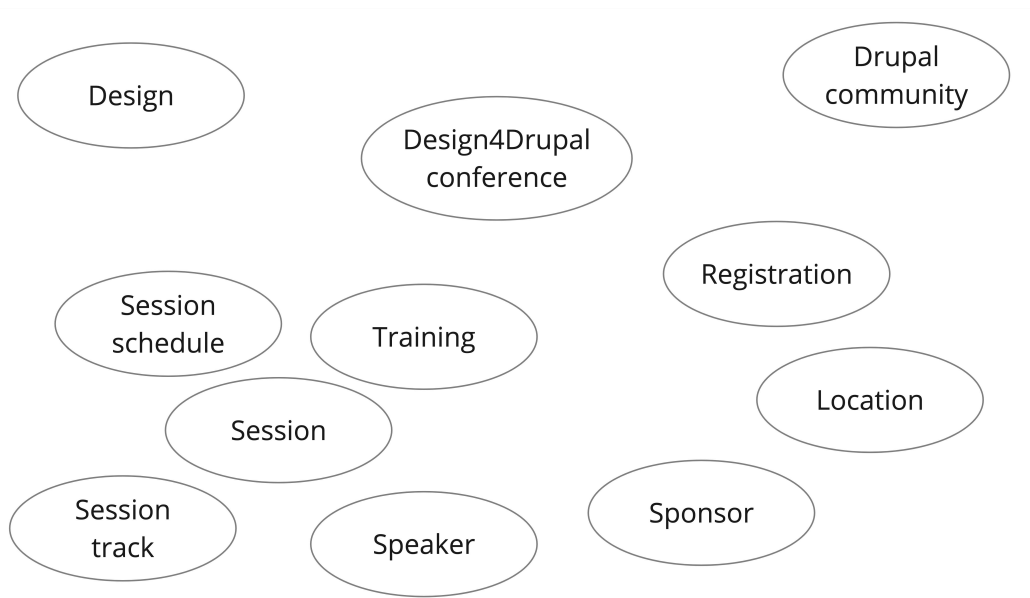


Sheng-Hung Lee is a designer, maker, and educator. He is trained as an industrial designer and electrical engineer, and his approach to problem-solving is influenced by his passion for how design and technology impact and can be integrated into society.

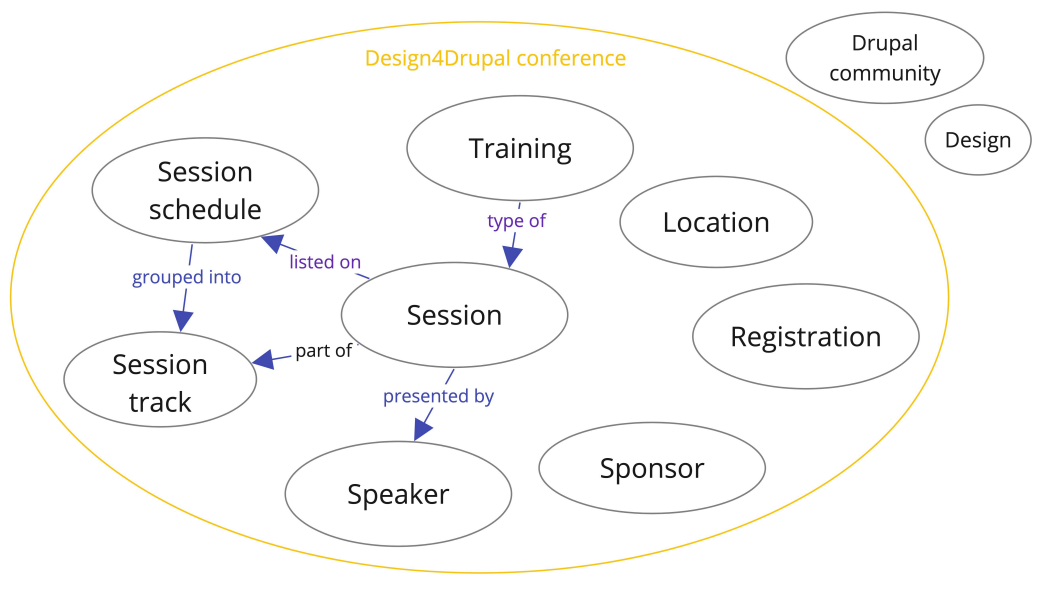
[Read more](#)

For an example, let's look at the Design4Drupal website as an example.

Looking through the navigation menu, the home page, and some of the other pages, we can uncover some of the core concepts that are important to Design4Drupal.



Thinks like the conference schedule, sessions, and speakers. But also larger concepts like design, and the Drupal overall community.



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We can start adding relationships between the concepts. Sessions have speakers, sessions appear on the schedule, the schedule is divided into tracks.

We could keep going and add more concepts and more detail, but this is already turning into a rough concept model representing Design4Drupal as a system.

The most important takeaway for this section of the presentations is the idea that you should be doing concept modeling like this when you build a website. Having a concept model helps in a few different ways.

Modeling helps to make sure we understand the underlying conceptual structure of whatever we're building.

When we do modeling *as a group*, it helps to build alignment across the team. It helps to identify connections that might not be obvious--for example, thinking about conference's relationship to the wider Drupal community and how that impacts.

It helps to resolve ambiguity. For example, the conference as a whole has a location. Individual sessions also have locations within the overall conference location. So there's a little bit more going on, which needs to be teased apart.

Then, this becomes a foundation for designing and building the website. It's a foundation to think through how the site will be organization. It's a foundation for creating content and linking it together. And for those of you building content models and content types in Drupal, this is a foundation for that as well.

I'm going to come back to this diagram in a few minutes to talk about how this translates to navigation menus. But first...

# **How do we arrive at a good conceptual structure?**

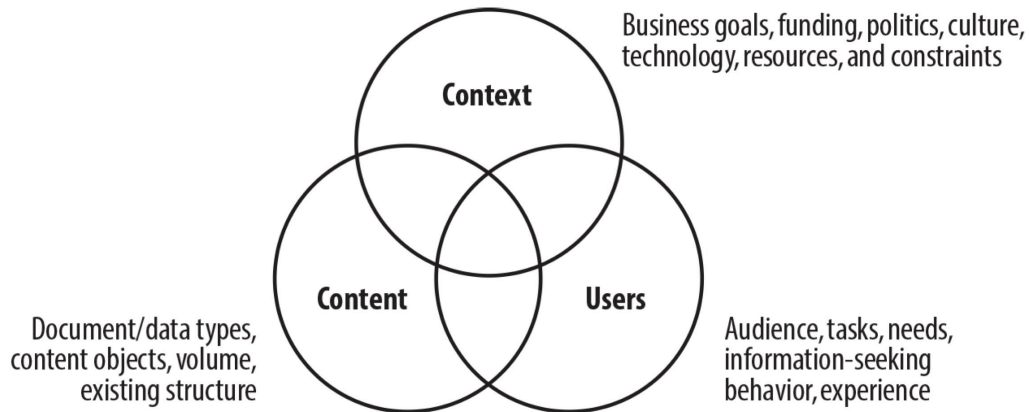
How does it fit into our process?

## **Rough design process**

1. Planning
2. Research/discovery
3. Synthesis/strategy
4. Design/development
5. Release/improve

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When you're working on a big project, I'm going to assume the process looks some combination of these things. In the early stages, you're gathering all of the information you're going to use to plan out the website.



*From Rosenfeld, Morville, & Arango.  
Information Architecture: For the  
Web and Beyond.*

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Lou Rosenfeld, Peter Morville, and Jorge Arango describe information architecture as an intersection of content, context, and users.

In your projects, you're probably doing research and gathering information in all three of these areas.

For Content, you're auditing the existing content, content types, metadata, you're looking at how content is categorized, and you're identifying what content is missing.

The Context includes the business. What's the organization's mission, their goals and success criteria. You want to understand their messaging--what are they trying to communicate to their audiences? Context also includes the broader environment. During the Pandemic, the context changed for many organizations.

And Users includes everything you typically look at in UX research: who are the audience, what are the scenarios and situations in which they interact with this organization, what are their goals, and what user needs are not being met.

## Common user models

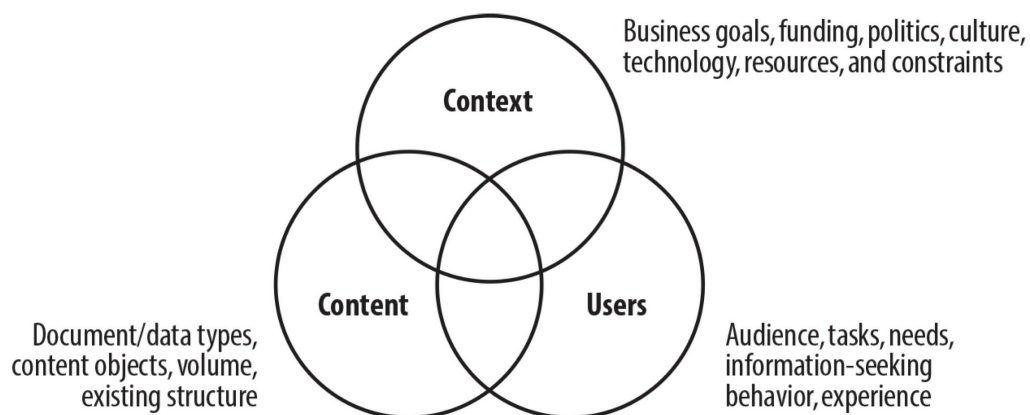
- personas
- scenarios
- activities
- mental models (see Indi Young, *Mental Models*)

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From a user perspective...

Understanding a user's mental model is especially important for information architecture. (see Indi Young's book, *Mental Models*)





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So, during the research phase, you're looking at elements of all three areas in that Venn diagram.

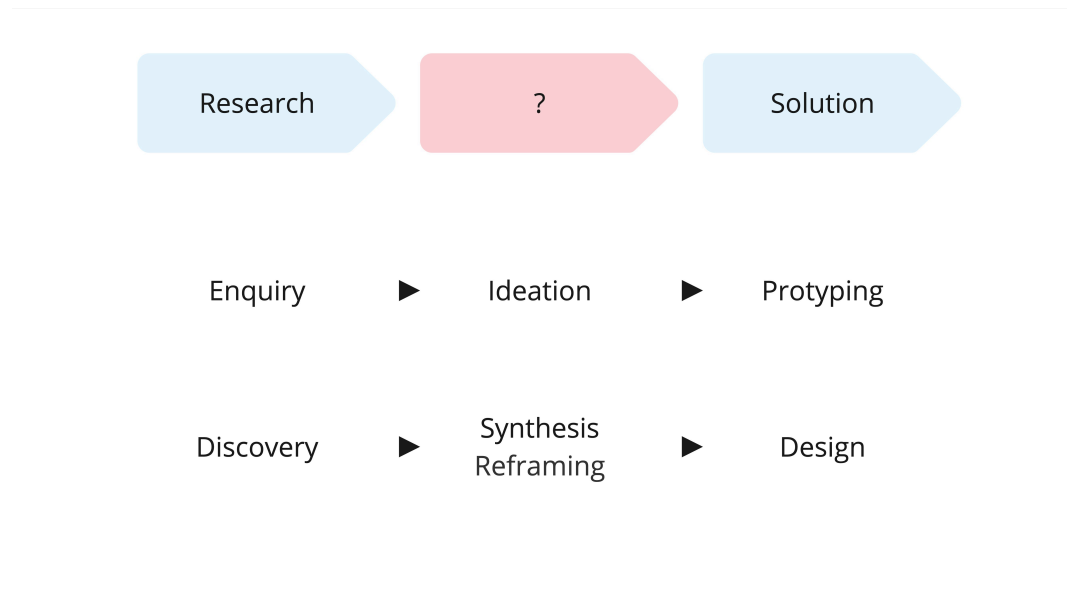
But then you get to the point where you need to take all the information you've gathered and translate that to solutions.



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You might reach a moment of confusion or loss of clarity, where you feel overwhelmed, struggling to understand the information that's coming to you.

You need to establish our own perspective how you're going to solve the design problem.



71

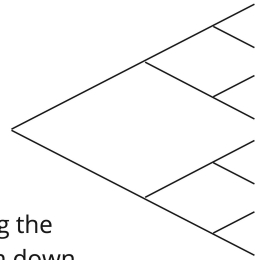
In design and design thinking, we have the concept of ideation, synthesis, or reframing in the middle of the process, where you come to a new understanding of the problem you're solving, which leads you to new ways of thinking about the solution.

**Divergence**

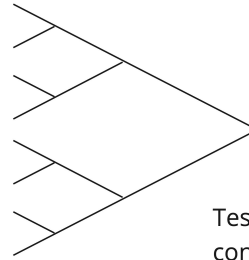
**Transformation**

**Convergence**

Breaking the  
problem down  
into pieces



Putting the  
pieces together  
in a new way



Testing to discover the  
consequences of the  
new arrangement

This process involves multiple iterations of divergence, transformation, and convergence.

- Divergence is breaking the problem down into pieces.
- Transformation is putting the pieces together in a new way.
- Convergence is testing to discover the consequences of the new arrangement.

This builds upon the information we've gathered about the user, content, and context.

Divergence, transformation, convergence: John Chris Jones (1970, 1980, 1992), *Design Methods*.

Image adapted from Hugh Dubberly (2005, 2008), *How do you design? A Compendium of Models*.

<https://www.dubberly.com/articles/how-do-you-design.html>

# Modeling

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That's where modeling comes in.

Information architects like Abby Covert and Joe Elmendorf talk about how diagramming and modeling are powerful tools to get through these moments.

Abby says that "Diagrams are particularly helpful in grounding us when we feel anxious because we can use diagrams to fly through time and space and consume a fuller picture. We can zoom out on problems and see different solutions. We can find secure footing in an unsure environment."

From Abby Covert (2022), *Stuck? Diagrams Help*.

I've had times when a client is talking about everything their organization does, and I'm thinking, wow, that's a lot, it feels like they're all over the place. My next step is probably to draw a picture to make sense to it.

**Modeling is useful for...**

## **understanding:**

- Getting through situations of ambiguity
- Synthesizing research
- Mapping what exists & how things work
- Communicating the things you're trying to understand

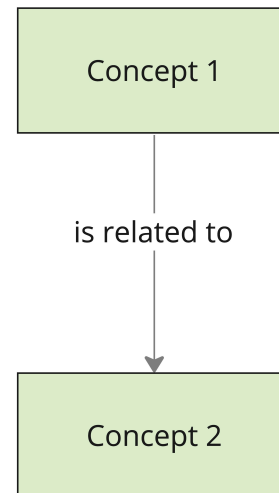
**Modeling is useful for...**

## **meaning-making:**

- Define the concepts and relationships we discover
- Explore new arrangements
- Build alignment
- Creating a conceptual foundation before (and during) UX design, content modeling, or data modeling

## Basic process for concept modeling

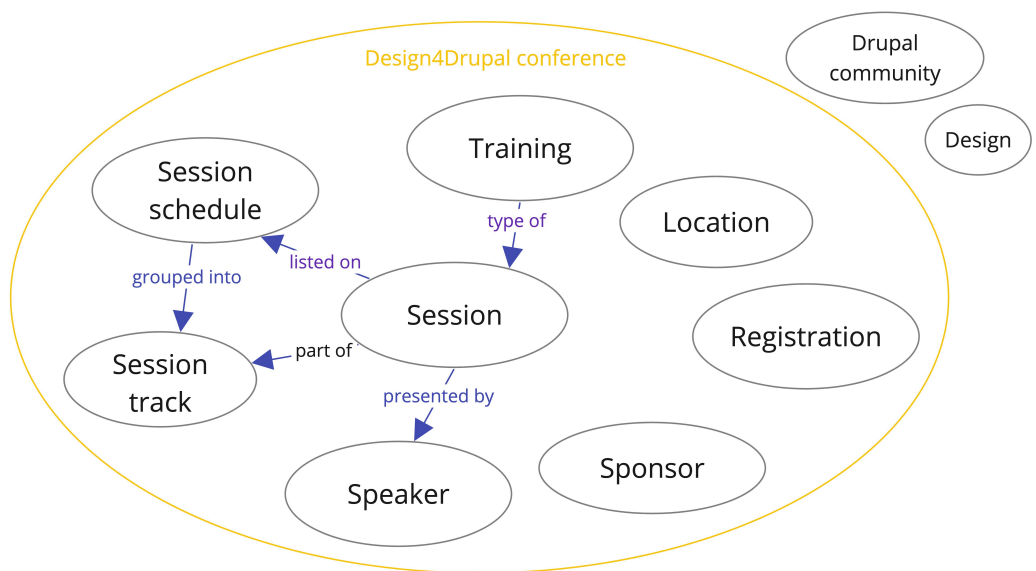
1. Gather a list of concepts (usually nouns)
2. Add the relationships
3. Label the relationships (usually verbs)
4. Arrange
5. Share / invite conversation / feedback / iterate



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Here's a basic process to create a concept model. This can be done for any topic where you want to understand, or disambiguate the concepts involved in a certain domain. The concepts or objects are nouns, and the relationships are verbs.





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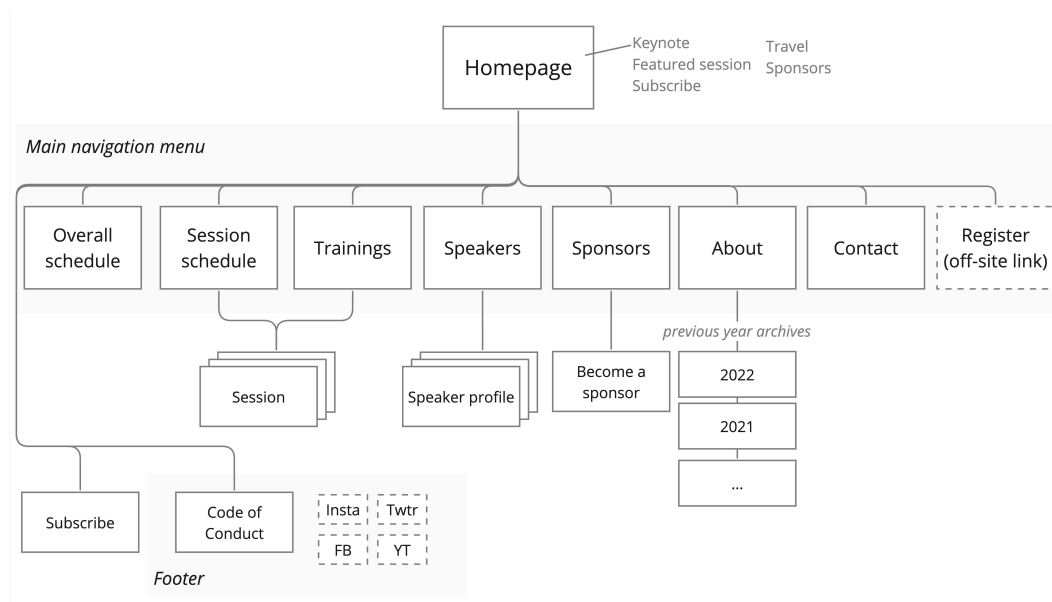
Going back to this example, having a concept model like this Design4Drupal example helps us to ask questions.

At the conceptual level, we have questions like what is a session?

What are the characteristics of a session?

What do we mean by location?

At the content level, we can ask questions about how the content will be organized. Speakers and Sessions are probably going to be node types in Drupal. While the concept of the Drupal community might impact what content will be written, or what external sites we'll link to.



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Finally, having the concept model helps us ask questions about navigation and sitemap structure.

Why are there two pages for the schedule?  
Why do trainings have a special page, and other sessions don't? Should the location and travel information have its own page?

Will a website visitor understand how we've organized this?

I'm not saying there's a right or wrong answer. just that these are questions to ask.

## Part II Recap

- Effective IA is built upon a cohesive *underlying conceptual structure*
- Use "Users/Content/Context" to explore the conceptual structure of the design situation
- Use concept modeling to synthesize, resolve ambiguity, and build alignment upstream of content modeling & UI design

# **Part III: From concepts to navigation design**

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Now let's see how this comes together and translates to navigation design.

Concept models

Content models

Sitemaps

Navigation systems (menus, etc.)

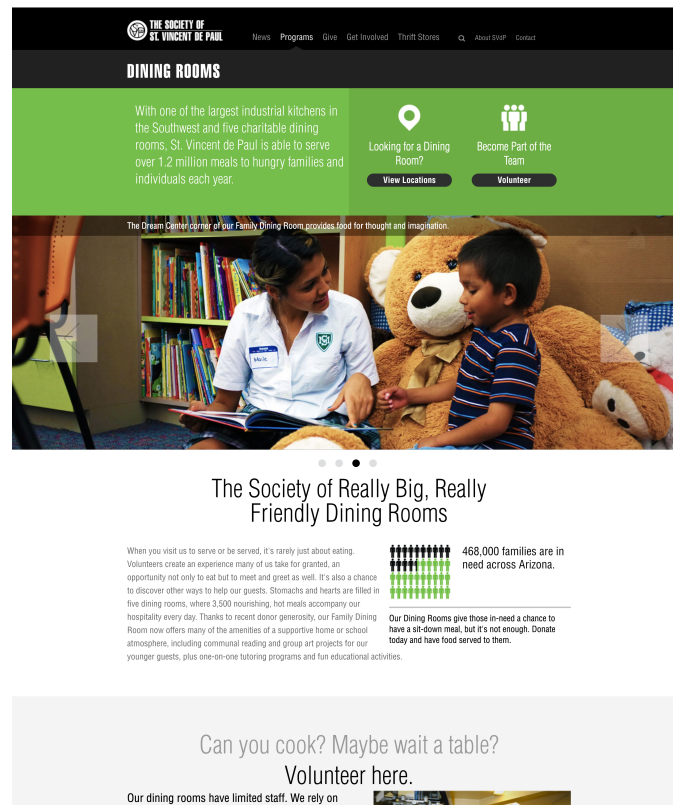
81

These are three different things.

Think of subway map or the Design4Drupal website. They're all part of the website's information architecture, but they focus on different things.

The navigation menus reveal specific aspects of the site's structure without telling you everything at once.

On a more complex website, there could be multiple concept models that address different issues, or different sitemaps for different areas, as well as multiple menus for different purposes.



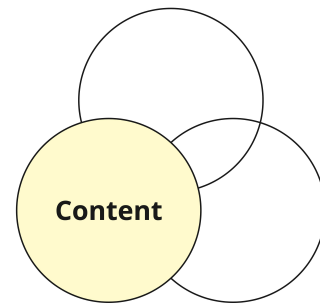
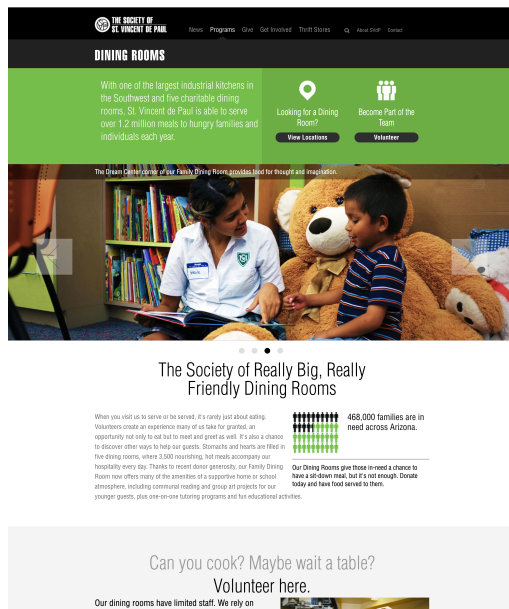
I'm going to demonstrate with one more example of a project.

This is a "before" picture from a website redesign for a large nonprofit in Phoenix, Arizona.

Supported by large, highly engaged community of volunteers and donors, SVdP offers services related to housing, food, clothing, healthcare, recovery, and other forms of support for people in need throughout the region.

Let's go through each of the three categories in the Venn diagram.

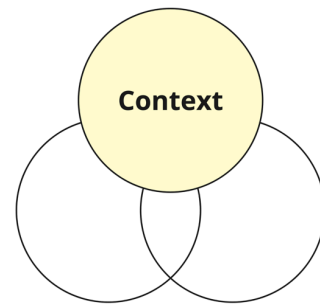
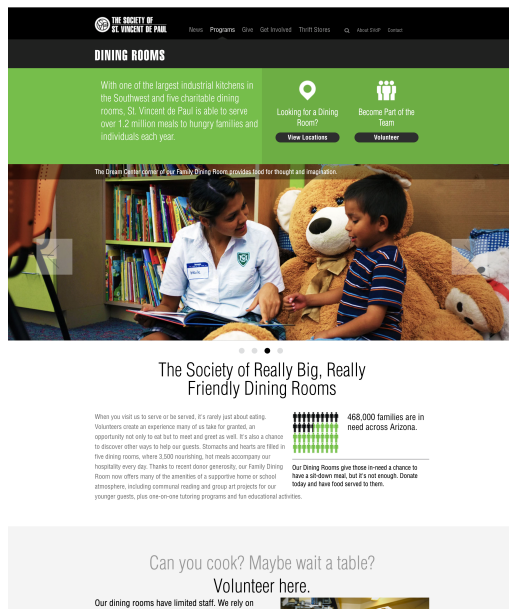
<https://web.archive.org/web/20220212201639/https://www.stvincentdepaul.net/programs/dining-rooms>



- Programs
- Locations
- Volunteer opportunities

Let's go through the three categories in the Venn diagram one by one. I'm just going to highlight a couple details from each.

Looking at the existing content, we see that this organization offers a variety of programs across a number of physical locations in the Phoenix area, and the website is promoting volunteer opportunities. But most of that information is flattened together into a single page type, the Program page.



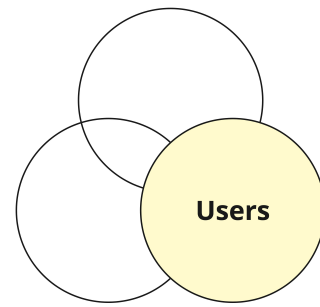
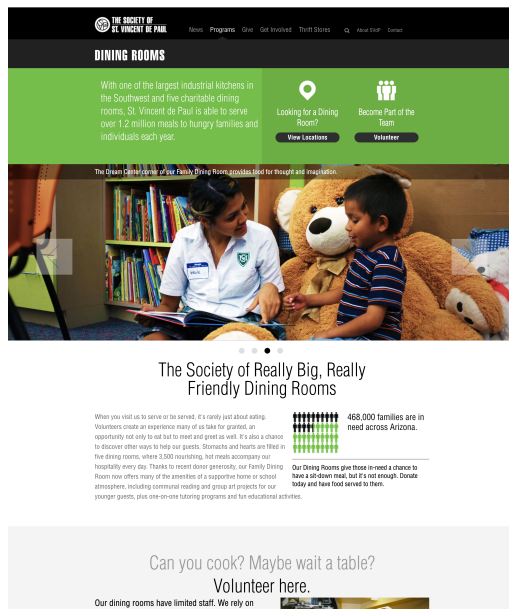
- Goals, mission, philosophy
- Importance of community & meaningful service
- Sustainable models for addressing homelessness, etc.

Thinking about it from a business perspective, we learned about the organization's mission and goals. Of course, they want to increase donations and volunteering.

But it was also important to understand how volunteering is not just a transactional relationship, but part of a culture of meaningful service and community building.

In addition, the organization has built sustainable models for addressing issues like homelessness, which has made them a major force in the region.

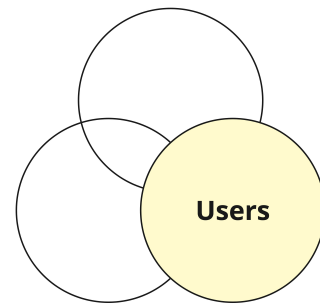
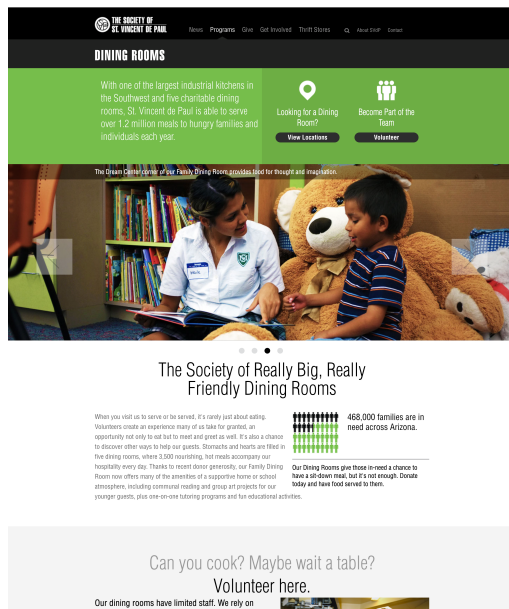




	Discover	Investigate	Decide	Act
<b>Starting Point</b> What kind of information do you need?	What is the problem? What are the goals? What are the constraints?	What are the options? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?
<b>Define</b> What does the user want?	What is the problem? What are the goals? What are the constraints?	What are the options? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?
<b>Needs and Pain</b> What does the user want to achieve or avoid?	What is the problem? What are the goals? What are the constraints?	What are the options? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?
<b>Requirements</b> What does the user need to do to get the job done?	What is the problem? What are the goals? What are the constraints?	What are the options? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?
<b>Implementation</b> What does the user need to do to get the job done?	What is the problem? What are the goals? What are the constraints?	What are the options? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?
<b>What does the user want to achieve or avoid?</b>	What is the problem? What are the goals? What are the constraints?	What are the options? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?
<b>What does the user need to do to get the job done?</b>	What is the problem? What are the goals? What are the constraints?	What are the options? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?
<b>What does the user want to achieve or avoid?</b>	What is the problem? What are the goals? What are the constraints?	What are the options? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?
<b>What does the user need to do to get the job done?</b>	What is the problem? What are the goals? What are the constraints?	What are the options? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?	What is the best option? What are the risks? What are the benefits?

From a user perspective, website serves a highly diverse audience.

We used activities like journey mapping as one tool to explore the kinds of information that each of these groups might need.



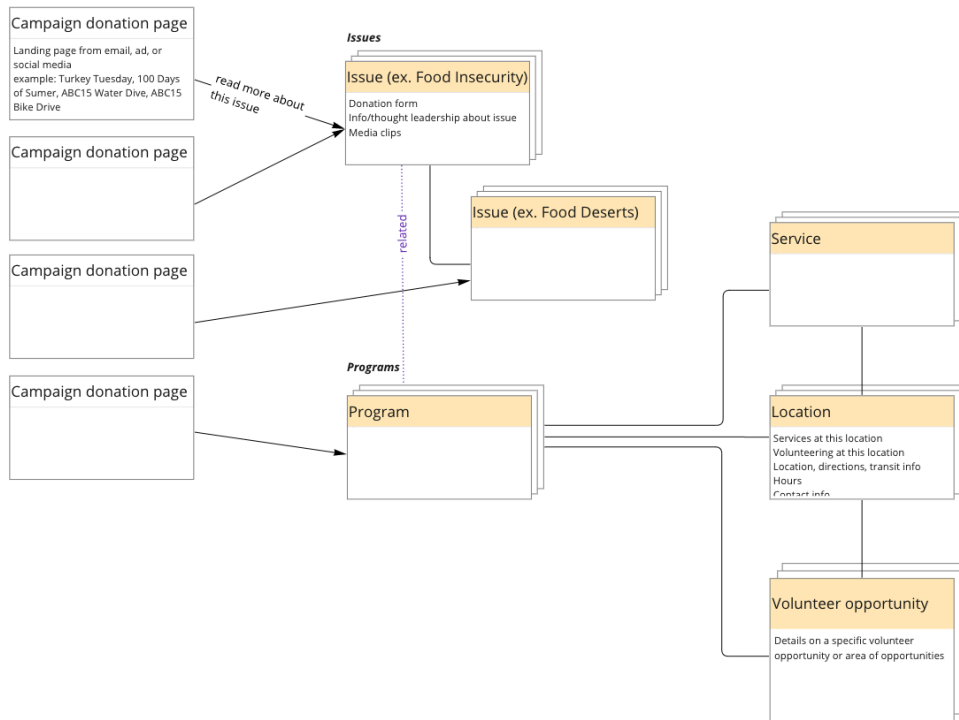
- Many, many audience segments
- Need for educational info
- Programs vs. Services

One interesting takeaway is that different audiences have different information needs even when they are reading about the same topic. The dining rooms are an important program because they are hubs where many different kinds of services are delivered. Donors might want information about dining rooms as a program overall, but a family traveling to a dining room needs information about the services they can access. So Program and Services are actually different kinds of information.



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Meanwhile, this is some of the sketching I was doing to try to capture the concepts that I thought would be important to the website. At this point I'm not worried about specific content - I'm just trying to map the system of how the organization works and how a community member is a part of that.



Later on, this is a rough draft for a more refined diagram narrowed down to concepts that would specifically appear on the website.

Each of these boxes represents a type of content.

The organization is organized around programs, and each program is associated with services, locations, and volunteer opportunities. We also added the idea of an Issue, like homelessness or food insecurity, that contains educational content relevant to the programs.

The key thing to realize is that each audience needs different information as they traverse this structure. So locations appear in different ways throughout the website. Volunteer opportunities appear in different ways.

Another benefit is that it was scalable. We were able to build searching and filtering capabilities around volunteer opportunities. We anticipated that the organization might need to build additional functionality around that in the future. Or they might need to build out more service content that had never been considered before.

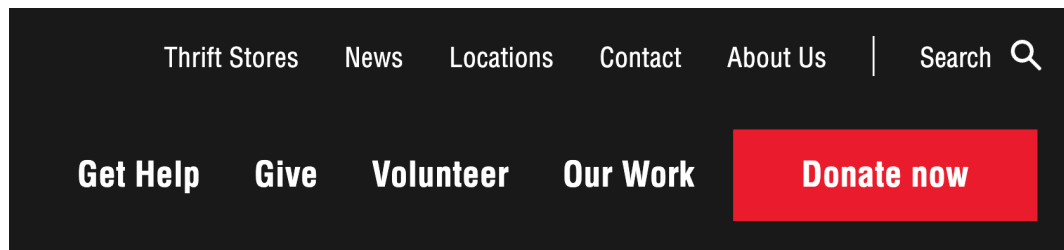
This model doesn't include all of the website's content. It just cover some of the core elements.



The sitemap shows how all of that fits together.

We arrived at some very distinct clusters of content. Someone who's making a donation needs very specific information about the organization's programs, impact, financials, and tax implications of donating. Someone thinking about volunteering needs to know why they should volunteer, what it's like to volunteer, and the process for volunteering. Same for a company who's thinking about forming a partnership. And so on.

So each of these things became a section of the website. The yellow elements show how those core content types are used throughout.



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The main navigation menu shows that the website was ultimately organized within for main sections: Get Help is for people seeking services, Give for donations and other types of contributions, Volunteer for volunteering, and Our Work discusses the organization's programs and operations.

The secondary navigation points to more focused types of content that someone might need in order to engage with the organization or travel to one of its locations.

# **Four purposes of a site's main navigation menu**

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That leads me to the four main purposes of a site's navigation menu. I'll go through these one by one.

I will share the slides so don't worry too much about remembering all of the details.

# **1. Provide pathways to all/most content**

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A navigation menu provides a path to anything a user might be looking for, even if they don't know how to get there.



# **1. Provide pathways to all/most content**

Things to think about:

- Build upon users' mental models
- Derive categories through content classification
- Choose labels that provide information scent

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This is where you want to build upon mental models.

## **1. Provide pathways to all/most content**

Ways of classifying content:

- By customer need
- By user activity/task
- By stage in the customer lifecycle
- By subject/topic
- By content type or metadata
- mixed

## **2. Provide quick, direct access to specific items/tasks**

## **2. Provide quick, direct access to specific items/tasks**

Things to think about:

- User scenarios
- Top tasks (e.g. Gerry McGovern)
- Known-item seeking may call for different labels

### **3. Inform users what's available on the site**

Things to think about:

- "Don't know what you need to know" and Exploratory info seeking
- Principle of recognition over recall
- Business goals, products, lines of business
- What is shown vs. hidden initially?

### **3. Inform users what's available on the site**

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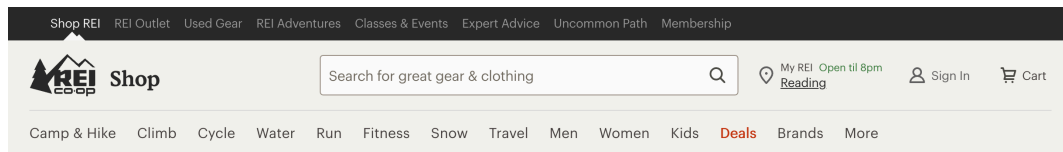
early 2010s - along with the wave of responsive & mobile first design, there was a narrative going around my workplace that users don't use navigation menus, they navigate via links in content. that idea was used to bring a lot of care and attention to having really good, well thought-out content. but that was also used to justify hidden (or no) navigation menus, and an overreliance on search.

## **4. Explain the brand**

Things to think about:

- Brand tone, voice, personality, key words
- Business goals (e.g. what needs to be promoted)

(This is a huge area where you don't get as much value out of an off-screen menu.)



*Stuart Maxwell, "The Politics of Navigation" at the IA Summit, April 24 2015*

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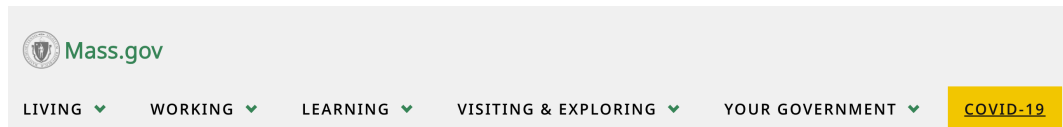
Stuart Maxwell tells a great story about how REI, in 2014, did an A/B test where they removed the word "Climb" from the main navigation because it wasn't performing as well as other links. "Soon after, they changed it back. Customers were upset. It sent an unintentional message that Climbing wasn't as important to REI anymore."



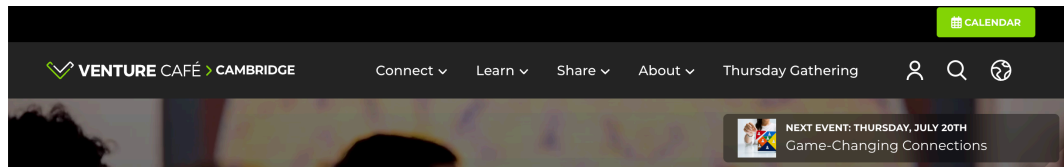
## **4. Explain the brand**

Things to think about:

- Brand tone, voice, personality, key words
- Business goals (e.g. what needs to be promoted)
- Ensure clarity, understandability, and information scent are not lost



Mass.gov is a great example of navigation that conveys a brand. It's very welcoming. Testing also showed that it was successful from a usability perspective as long as the user knows what they're looking for. Where it fails is that it doesn't really educate you about what you can do on the website.



Venture Cafe Cambridge is another example where the words Connect, Learn, and Share make me feel really good, but if I want to know what events are coming up, I have no idea what to click on. Obviously, they've compensated for this by adding not one, but *three different UI elements* right next to each other to make sure users are able to find event information.

## Checks/tests for main navigation taxonomy

- Use user scenarios & user tasks as a checklist
- Consider different info seeking behaviors (known item, exploratory, don't know what you need to know, etc.)
- Test: "Where would you **expect** to find...?"
- Ask: "**What** would you expect to find under [label]?"

## Purposes of a site's main navigation menu

1. Provide pathways to all/most content
2. Provide quick, direct access to specific items/tasks
3. Inform visitors what's available on the site
4. Explain the brand

*And: Promote features/content, orient users, inspire users, inform search engines<sup>1</sup>*

1. Jenny Benevento and Abby Covert, "Put A Label On It: Navigation As Brand", IA Summit 2018

On any given website, some of these may be more important than others.

# **Thank you!**

## **Slides & resource guide**

[danzollman.com/navigation](http://danzollman.com/navigation)

## **Contact**

[danzollman.com](http://danzollman.com)



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Not used:

Looking at the simplicity of these concept models, it might seem like the conceptual structure of the product you are building is obvious without modeling it. But I'd still argue that taking the time to model it will help you build clarity. It might lead you to nuance that you would not have noticed otherwise.

And involving other people helps to build alignment and shared understanding. When you have different team members working on different parts of a product, and your team doesn't have a shared understanding, you can end up with a disjointed user experience. That's where diagramming can be really powerful, even when it's simple.