

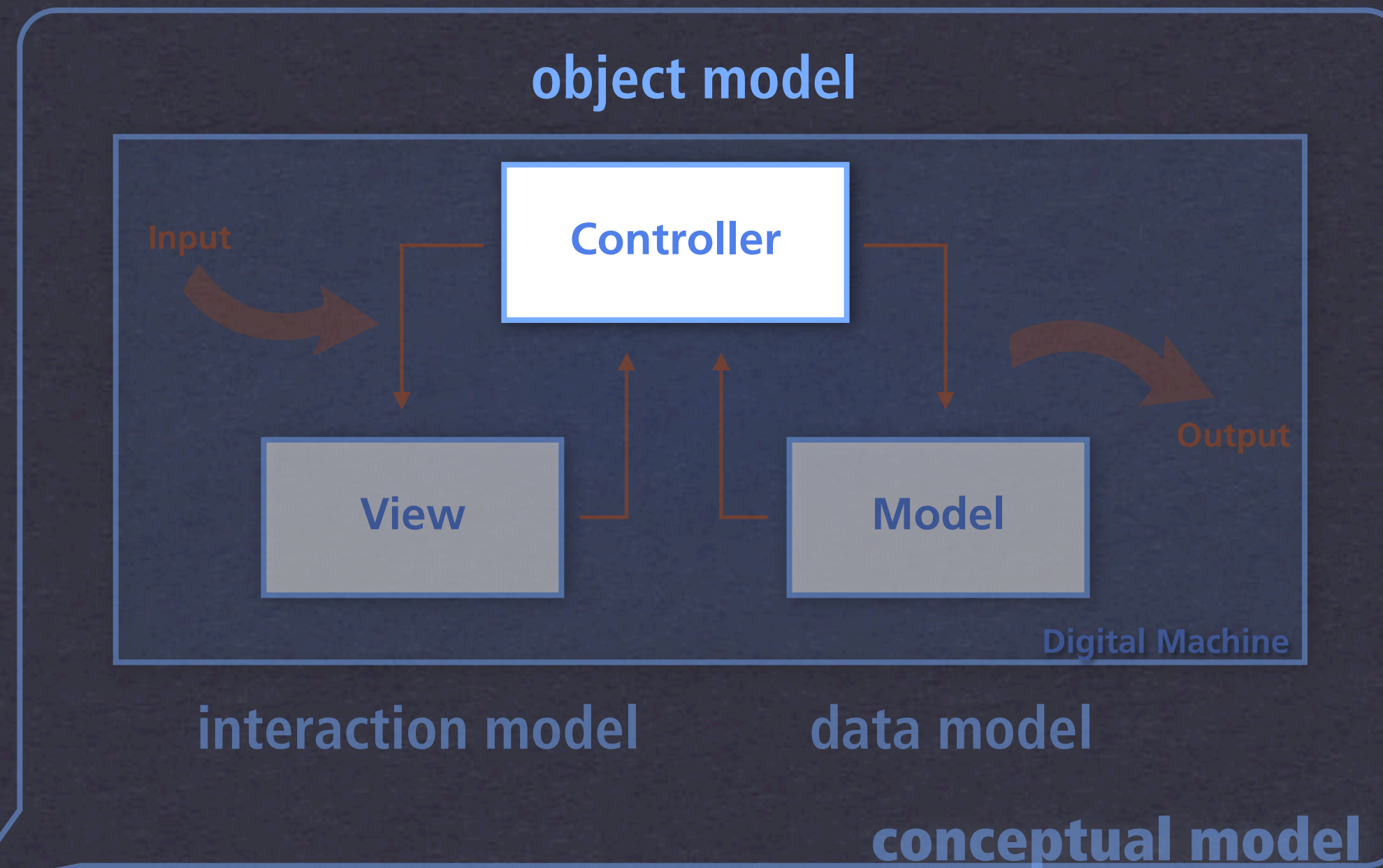
# Object Model

## How does this thing work?

No 5, *Design of Digital Machines*  
Tim Sheiner



# The four sub models of the machine





# How does the thing work?

## The object model defines system logic

- ⦿ what are the functional objects and what do they do?
- ⦿ how are these objects connected to each other?
- ⦿ what is the currency they exchange?



# The object model is narrative

The object model is like a story so you can use narrative analytic techniques to design or uncover it.

For example:

1. Tell a story about system with the same purpose as the machine you are designing
2. Identify the characters in the story, what they care about, who they speak to and what they can do
3. The complicated character is the human part of your system, the flat, one-dimensional characters are the software objects



# Some common object classes

- ◎ **Document**

the thing the user creates with the system

- ◎ **Container**

groups or organizes a list of other objects

- ◎ **Navigator**

enables movement between views, workflows or objects

- ◎ **Editor**

enables a transformation on an object

- ◎ **Reporter**

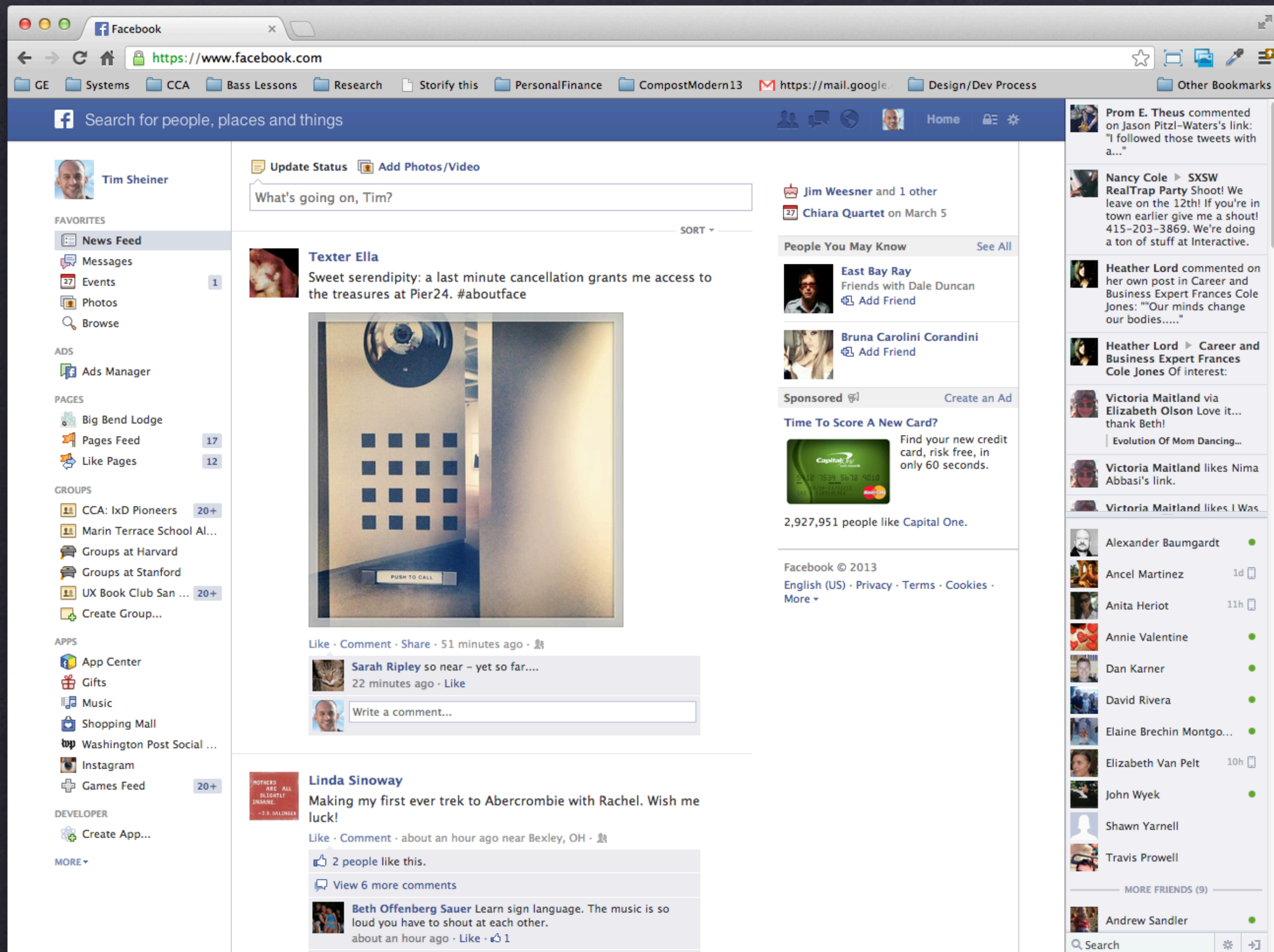
presents read only information about an object

- ◎ **Connector**

translates object metadata from one format to another



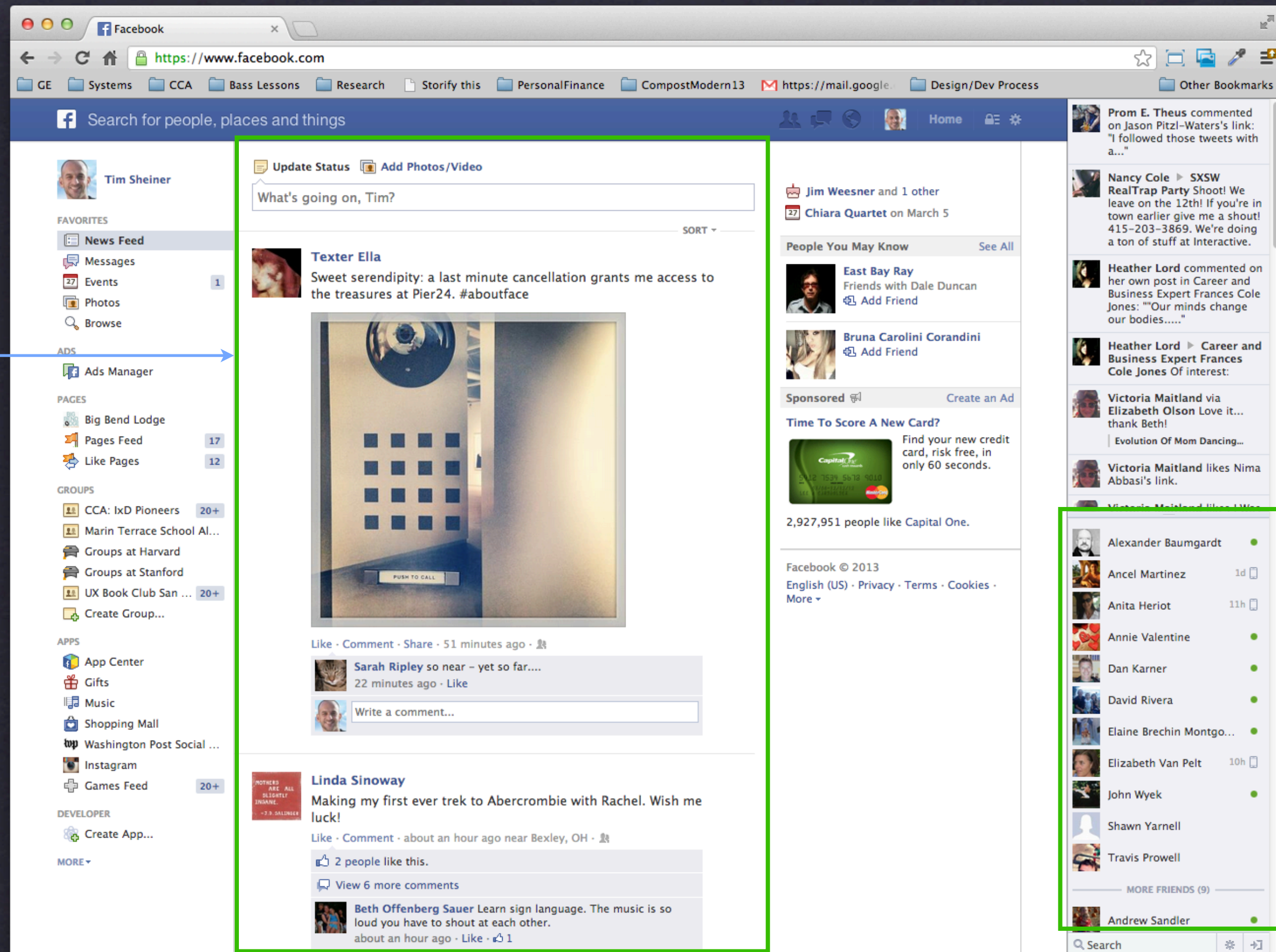
# Find the objects: social network





# Find the objects: social network

Container



Container



# Find the objects: social network

Container

Container

Container



Container



# Find the objects: social network

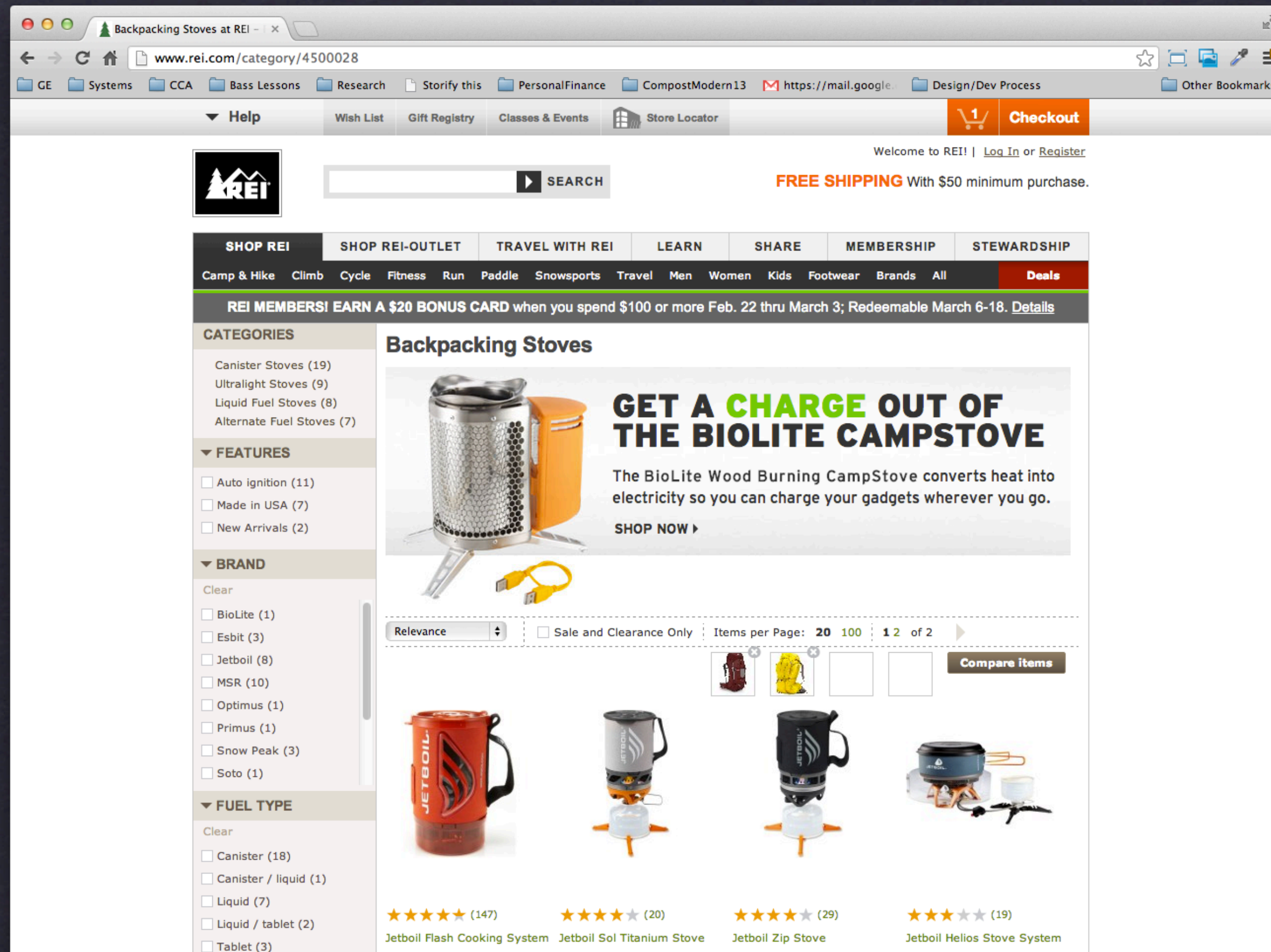
The image shows a screenshot of the Facebook website from 2013, with several design elements highlighted by green boxes and labeled with blue arrows and text:

- Editor:** Points to the "Update Status" and "Add Photos/Video" buttons at the top of the user's profile.
- Container:** Points to the left sidebar navigation menu.
- Container:** Points to the main content area of the user's profile.
- Editor:** Points to the "Write a comment..." text input field.
- Container:** Points to the right sidebar navigation menu.
- Reporter:** Points to the "David Rivera" entry in the right sidebar's "Friends" list.

The Facebook interface includes a top navigation bar with the Facebook logo, a search bar, and links to Home, Settings, and Help. The left sidebar contains sections for Favorites (News Feed, Messages, Events, Photos, Browse), ADS (Ads Manager), PAGES (Big Bend Lodge, Pages Feed, Like Pages), GROUPS (CCA: IxD Pioneers, Marin Terrace School Al..., Groups at Harvard, Groups at Stanford, UX Book Club San ..., Create Group...), APPS (App Center, Gifts, Music, Shopping Mall, Washington Post Social ..., Instagram, Games Feed), and DEVELOPER (Create App...). The main content area shows the user's profile (Tim Sheiner) with a status update, a photo of a door, and a comment from Sarah Ripley. The right sidebar shows a list of friends, including Alexander Baumgardt, Ance Martinez, Anita Heriot, Annie Valentine, Dan Karner, David Rivera, Elaine Brechin Montgo..., Elizabeth Van Pelt, John Wyek, Shawn Yarnell, Travis Prowell, and Andrew Sandler.



# Find the objects: e-commerce

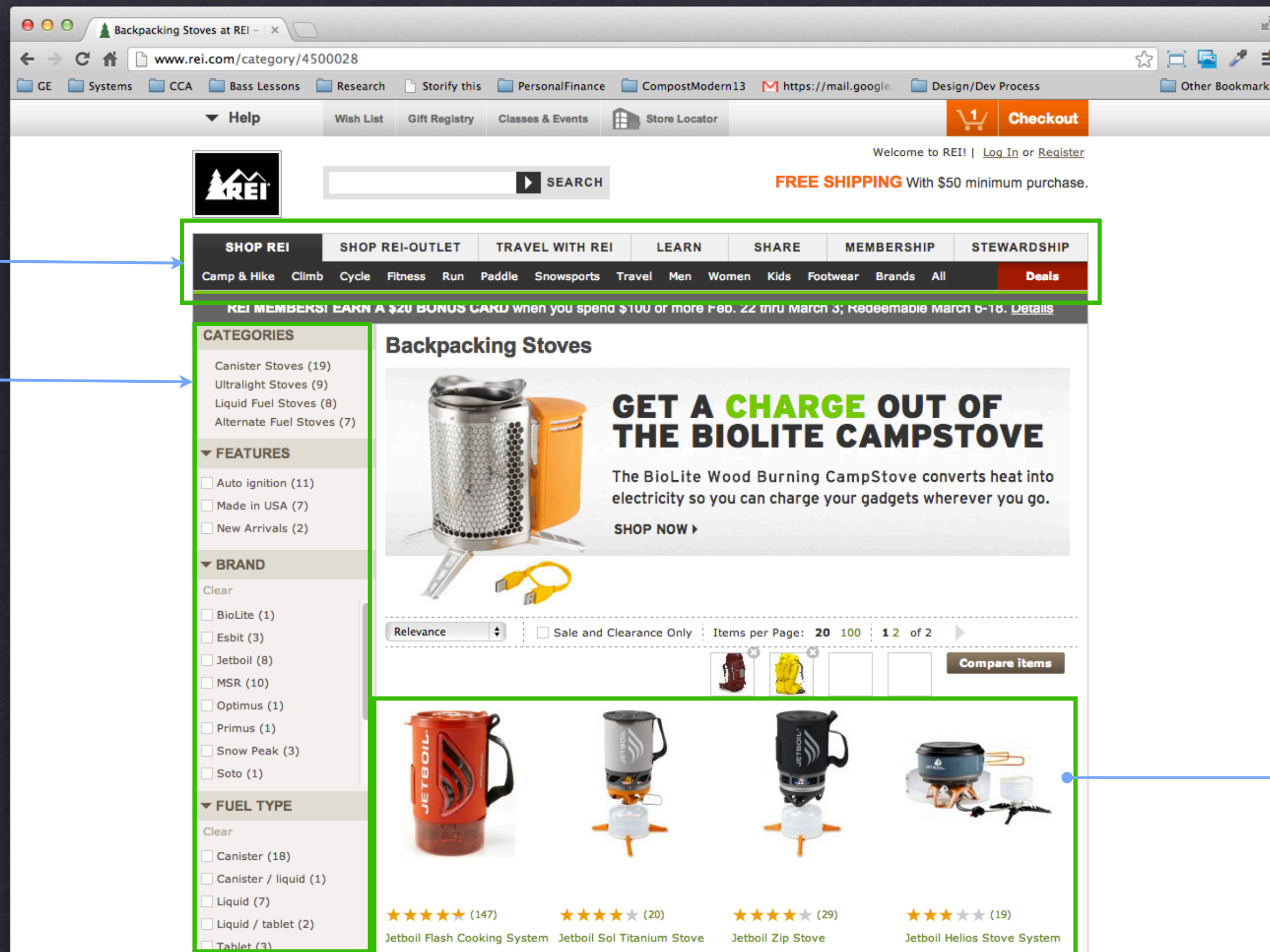




# Find the objects: e-commerce

Navigator

Navigator



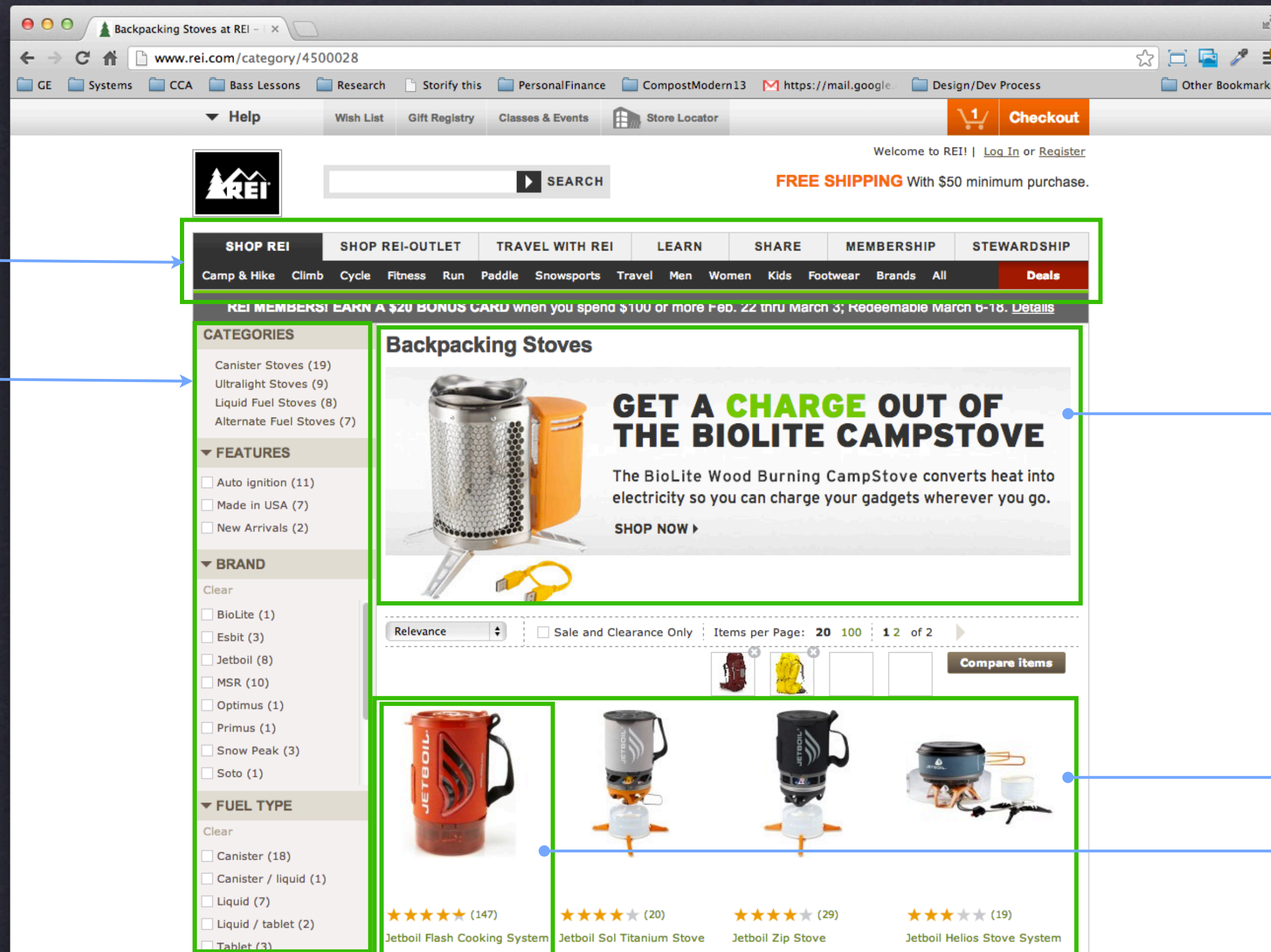
Container



# Find the objects: e-commerce

Navigator

Navigator



Container

Container

Container



# Find the objects: e-commerce

Navigator

Navigator

Container

Document

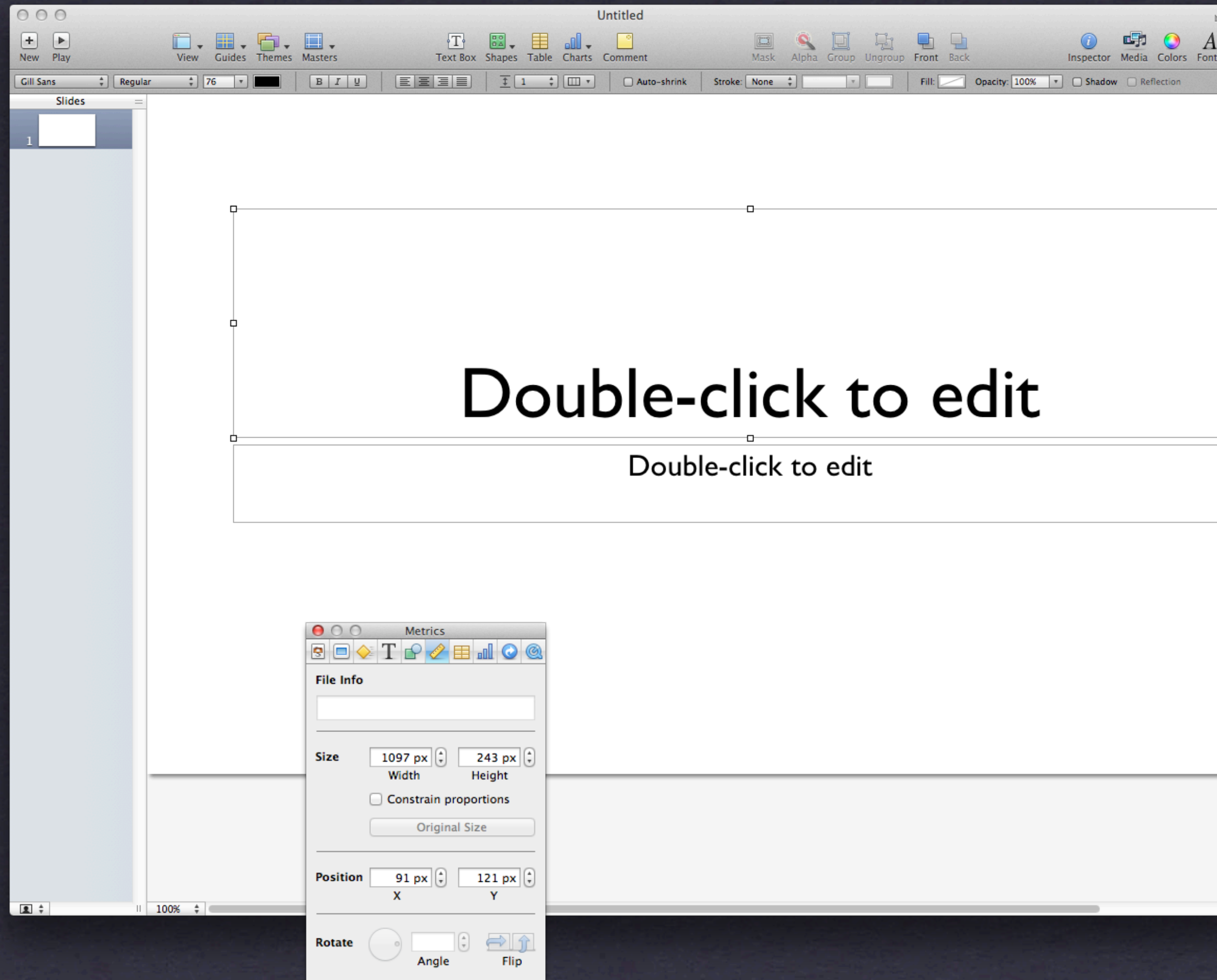
Container

Container

The image is a screenshot of the REI website's 'Backpacking Stoves' category page. The browser address bar shows 'www.rei.com/category/4500028'. The page features a top navigation bar with links like 'Help', 'Wish List', 'Gift Registry', 'Classes & Events', and 'Store Locator'. Below this is a search bar and a 'CHECKOUT' button. The main content area is divided into a left sidebar and a right main section. The sidebar contains a 'CATEGORIES' list (Canister Stoves, Ultralight Stoves, etc.), 'FEATURES' (Auto ignition, Made in USA, etc.), 'BRAND' (BioLite, Esbit, Jetboil, etc.), and 'FUEL TYPE' (Canister, Liquid, etc.). The main section has a large promotional banner for the 'BioLite CampStove' with the text 'GET A CHARGE OUT OF THE BIOLITE CAMPSTOVE'. Below the banner is a 'Compare items' button. At the bottom, there is a grid of four product listings: 'Jetboil Flash Cooking System', 'Jetboil Sol Titanium Stove', 'Jetboil Zip Stove', and 'Jetboil Helios Stove System'. Each listing includes a product image, a star rating, and the number of reviews. Annotations with blue arrows point to various parts of the page: 'Navigator' points to the top navigation bar and the left sidebar; 'Container' points to the main content area; 'Document' points to the 'Compare items' button; and two 'Container' labels point to the product listings grid.



# Find the objects: designer app

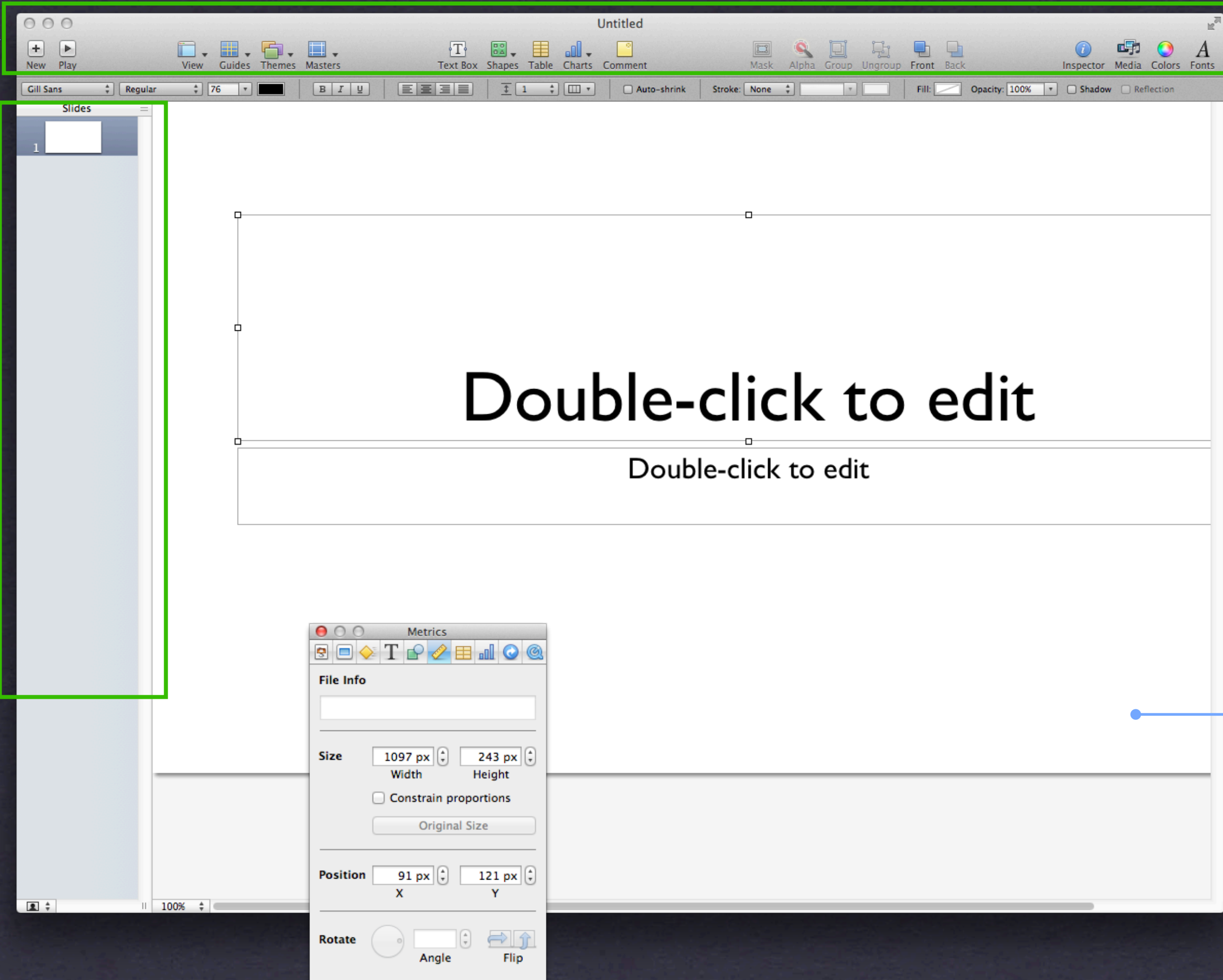




# Find the objects: designer app

Container

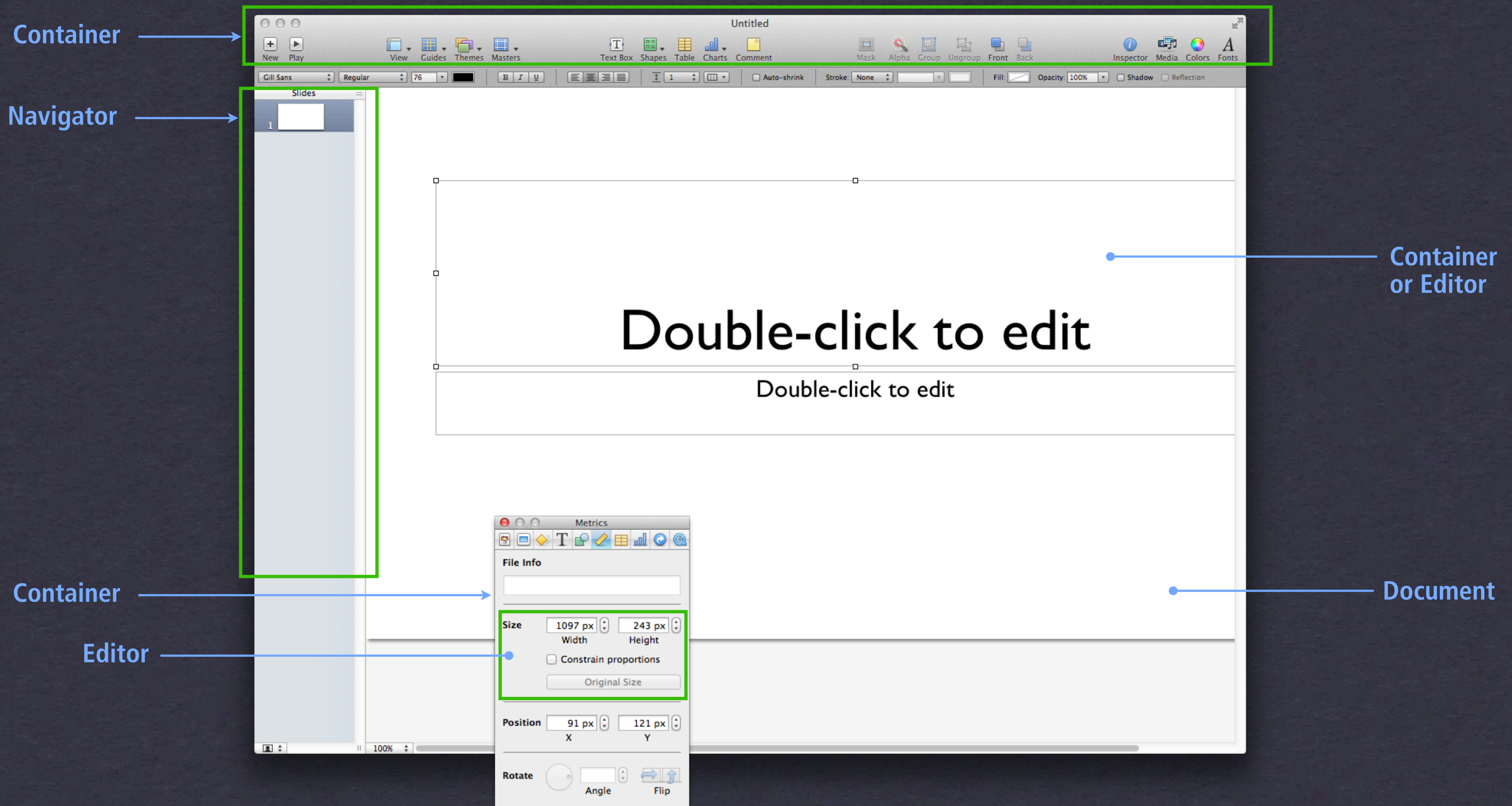
Navigator



Document



# Find the objects: designer app





# The object definition

## ◎ Name

Usually descriptive of the object's role in the system

## ◎ Description

Elaborates the value or utility of the object; why it is required

## ◎ Attributes

The object's metadata, the values that make one instance unique compared to another instance of the same object

## ◎ Operations

Usually what the user can do to the object, sometimes what the object can do to other objects

## ◎ Privacy

What roles can access what operations of this object

*extension of Johnson & Henderson, Conceptual Models, 2012*



# Communicating the Object Model

## Several standard forms

- prose list
- table
- illustration



# Object Model Example

## messageMe Objects

messageMe's objects are the source of all application functionality. The objects themselves reside within the messageMe instance, with each conversation having instances of of the objects available to it. In the initial conception, all conversations have access to all objects, however, restrictions could be imposed to create differentially valued offerings.

### Activity Viewer

The activity viewer object contains and displays conversation events. Its rendered appearance will be dependent on the view and filter assigned to it. Examples of possible views include a timeline that lists events sequentially by time, and a calendar that arranges events in the familiar calendar grid view. Additionally, the activity object can be filtered in terms of any of the parameters assigned to events. An activity widget defines a specialized combination of a view and filter for a particular use, for example, a To Do List.

### Notebook

The notebook object permits individual to create private events. In general its functionality will be very similar to the Activity object but it will likely support a reduced set of events.

### Messaging

The messaging object permits text content to be exchanged between objects and members. There will be various types of messages, including chat, email, posts and notifications, each with particular parameters and views. The messaging object may have the unique ability to be embedded within the activity object so that, for example, chats may be viewed within a timeline context.

### Collaboration

The collaboration object is designed to support realtime co-working. As this time it is believed that it will be based largely upon the [Etherpad](#) open source project, potentially with an additional layer for adding images and post-it note objects.

### File Viewer

The file viewer object is for displaying documents for conversation discussion. It must be able to import and display a large variety of standard formats from a variety of sources including the user's local machine to cloud services.

### Screen Viewer

The screen viewer is for real time screen sharing.

### Meetings

The meetings object is for scheduling and managing voice and video calls. It should meet existing meeting object standards by including elements like invitations, various scheduling options (e.g. one-time, all day, repeating), reminders and have the ability to call participants.

### Tasks

The tasks object permits members to assign tasks to themselves and other members. Tasks will have a set of relevant parameters like subject, description, label and status.

### Finder

The finder object is a special case of the messaging object that when used allows one user to send an urgent notification to another user. The notification content cannot be edited, and simply directs the receiving user to contact the sending user as soon as possible.

## Prose List

Familiar information presentation for all users, but must actually be read to have value.

Does not include a visual presentation of object connections so generally needs to be supplemented with some kind of illustration.



# Object Model Example\*

**Table 4.1:** Object/operations analysis for simple office calendar application.

Objects	Attributes	Operations
Calendar	owner, current focus	examine, print, create, add event, delete event
Event	name, description, date, time, duration, location, repeat, type (e.g. meeting)	examine, print, edit (attributes)
To-Do item	name, description, deadline, priority, status	view, print, edit (attributes)
Person	name, job-description, office, phone	send email, view details

## Table

Effective and clear method for communicating object specifics.

Not best for communicating narrative, subtlety or object connections.

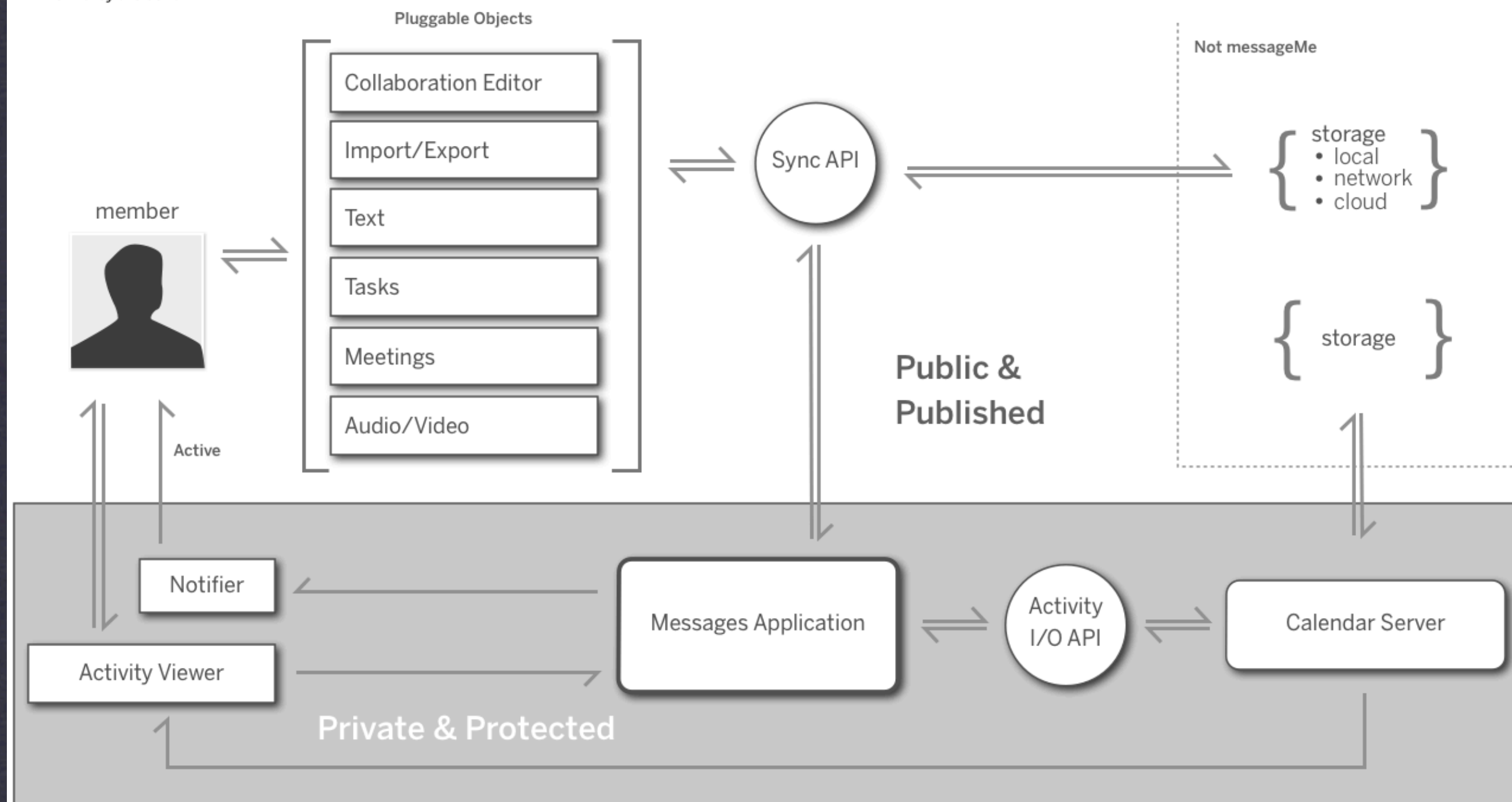
*\*redrawn from Johnson & Henderson, Conceptual Models, 2012, p. 35*



# Object Model Example

## messageMe Object Model

The fundamental principle is that ALL activity passes through the Messages application. Therefore, Messages knows about all events in the system, and controls the visibility of those events and to whom they are sent.



## Illustration

The best way to communicate the flow of currency within or the narrative of the system.

Unless extensively annotated, requires some prose-based supplement to define the object details.



# Object Modeling Challenges

- **Level of modularity**

objects contain objects, what is the right level of detail to consider for the object model?

- **When to group, when to separate, how much to distinguish**

are two things different because they are different objects or different instances of the same object and then how many types of an object are there?

- **User invisible objects and non-interactive objects**

tracking objects that are not part of the view, but are relevant to the model and controller



**fin**