

## 04 Artifact Analysis

A systematic examination of the material, aesthetic, and interactive qualities of objects contributes to an understanding of their physical, social, and cultural contexts.

The emphasis of artifact analysis is on the object itself. Artifact analysis asks: what do objects have to say about people and their culture, time, and place? The researcher is attempting to understand the substance of the object and what it says through its material, aesthetic, and interactive qualities.

Material analysis addresses the quantitative inventory of artifacts in the environment under study, and such defining characteristics as the material composition, durability, wear patterns, and disposability.

Aesthetic analysis includes a subjective visual assessment, but also aspects such as historical references, whether the artifact can be identified with a particular era, time, or place. The analysis here can also include the aesthetics of interaction, responding to qualities of experience associated with object use, and an emotional assessment if significant object meaning can be assumed or deciphered.

Interactive aspects of the analysis address the explicit characteristics of operational use and behaviors that the artifact affords, for example, functional or instrumental, mechanical or technological, simple or complex, immersive or multitasked, positive or negative. Interactive aspects should also consider social, shared, or collaborative intent, and whether there is evidence of misuse, adapted use, or adjustments, often suggesting design opportunities.

A final element of analysis should address the location of objects, including public or private, where they are stored, displayed, or carried, if they are part of a larger whole or system, and if they are owned, shared, or communal or corporate property.

All aspects of these interrelated qualities need not be addressed for every analysis, but rather a focused set should be established corresponding to the particular inquiry. A worksheet composed in advance for note taking will guide the researcher in documenting appropriately, and aid in summary and analysis. Visual documentation of artifacts through photographs, video, or sketches is essential.

An artifact analysis can be conducted in participant homes or workplaces, but can also be a useful tool for examining and comparing precedent and competitive products, or for studying specific aspects such as materials and manufacturing processes, colors, brands, or online presence. It can be an informative tool to help understand physical and digital objects.

### Further Reading

Artifact analysis owes some of its history to the cultural inventory used in anthropology. See for example:

Collier, Jr., John, and Malcolm Collier. *Visual Anthropology: Photography as a Research Method*. Albuquerque, NM: University of New Mexico Press, 1986.

Objects may also be used as a means of analysis. For example, the method of "interaction relabeling" helps participants reinterpret the features of an existing product to suggest possibilities for new aesthetic interactions: mapping the elements of a board game, running shoe, or toy, for instance, with the functions of a digital appointment calendar, various parts representing elements and actions of an imagined system. See:

Djajadiningrat, J. P., W. W. Gaver, and J. W. Frens. "Interaction Relabelling and Extreme Characters: Methods for Exploring Aesthetic Interactions." *Proceedings of Designing Interactive Systems DIS '00*. New York: ACM: 66-71, 2000.



Artifact analysis is a systematic examination of the material, aesthetic, and interactive qualities of objects in context.

Behavioral  
Attitudinal

Quantitative  
Qualitative

Innovative  
Adapted  
Traditional

Exploratory  
Generative  
Evaluative

Participatory  
Observational  
Self reporting  
Expert review  
Design process

# 07 Behavioral Design

The intentional use of design to influence people's behavior, translating insights from different disciplines into design techniques applicable to interfaces, products, services, and environments.

All design influences people's behavior, from the layout of a room or the color of a button, to much more structural issues around the design of services and systems (like government to social media) with which we interact. Many activities in user research, involve observing or investigating these links between design and behavior. But, using design *intentionally* to influence what people do, known variously as behavioral design, design for behavior change, persuasive design—among other names—has grown significantly as a field in recent years, particularly with a focus on affecting social, health, or environmental outcomes.<sup>1</sup> For example, an ecosystem designed around fitness tracking via a smart watch, from how different types of feedback are visualized, to the ability to set goals and track progress via the app, to the ways that users are motivated to buy and remain engaged with the system in the first place, all falls under the scope of behavioral design.

Behavioral design involves a multidisciplinary approach, drawing on knowledge and models from other fields relating to how people think and act, and applying those insights in design. These include social, cognitive, and ecological psychology; decision research; behavioral economics; human-computer interaction (HCI); ethnography; science and technology studies; cognitive anthropology; human factors and ergonomics; cybernetics; ethics<sup>2</sup>; and architecture. While each discipline has its own approaches to contribute, there are some useful cross-domain, cross-disciplinary concepts to frame our thinking about how to influence behavior through design. At the level of individual behavior, most approaches are about:

- **enabling:** making a certain behavior easier for someone to do
- **motivating:** trying to get someone to want to perform or not perform a particular behavior
- **constraining:** making an undesired behavior harder to do

A number of toolkits and guides have been developed<sup>3</sup> that aim to provide designers with a more structured process for exploring behavioral design techniques. One approach, taken with the *Design with Intent Toolkit* illustrated here, is to provide a "pattern library" for brainstorming, exploring problem-solution spaces, and classifying existing ideas, drawing on examples and insights from different disciplines.

Chapter contribution by Dan Lockton

1. Tromp, Nynke and Paul Hekkert. *Designing for Society: Products and Services for a Better World*. London: Bloomsbury, 2018.
2. Lilley, Debra and Garrath Wilson. "Integrating Ethics into Design for Sustainable Behaviour." *Journal of Design Research* 11, no. 3 (2013), 278-299.
3. Some useful toolkits and collections include:
  - A. Lockton, Dan, David Harrison, and Neville Stanton. *Design with Intent: 101 Patterns for Influencing Behaviour Through Design v1.0*. Windsor: Equifine, 2010. Available at <http://designwithintent.co.uk>
  - B. Daae, Johannes and Casper Boks. "Dimensions of Behaviour Change." *Journal of Design Research* 12, no. 3 (2014), 145-172.
  - C. Selvfors, Anneli, Sara Renström, and Helena Strömberg. "Design for Sustainable Behaviour: A Toolbox for Targeting the Use Phase." *Eco-Design Tool Conference*, Gothenburg, Sweden, 2014.



The *Design with Intent* toolkit groups 101 design patterns for influencing behavior, drawn from a variety of disciplinary perspectives. The patterns are presented through eight lenses; each offers a particular worldview on people's behavior. Each pattern is phrased as a question which designers can ask in applying it to a problem, as part of an idea generation process, to map a possibility space, or to analyze existing examples. The toolkit aims to challenge designers to think outside the immediate frame of reference suggested by the brief (or the client), and to help with transposing ideas between domains. The lenses are intended to be primarily a way of triggering multiple viewpoints. Each also represents a particular balance of emphasis on cognition or context—e.g. the Cognitive lens is primarily about cognition, while the Architectural lens is primarily about context.

Courtesy of Dan Lockton

Behavioral Anti-Idiom	Quantitative Qualitative	Innovative Adapted Traditional	Exploratory Generative Evaluative	Participatory Observational Self-reporting Expert review Design process
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# 22 Concept Mapping

Concept mapping is a visual framework that allows designers to absorb new concepts into an existing understanding of a domain so that new meaning can be made.<sup>1</sup>

A concept map is a sense-making tool that connects a large number of ideas, objects, and events as they relate to a certain domain. It provides a scaffolding that can help designers visualize the complexities of a system, and assists them as they make and break connections, study existing connections, and expand on what is already understood but possibly taken for granted within a particular system.

Concept maps consist of individual *concepts* (a well-understood idea, object, or event; usually a noun or noun cluster) connected by *linking words* (usually a verb). When linking words connect two or more concepts, a *proposition* is formed that creates a meaningful statement. As propositions emerge, some relationships may reflect knowledge that is already understood, but others will represent new knowledge.<sup>2</sup> The power of the concept map is that it brings new connections into focus within the context of already understood information. As new insights are formed, designers can study relationships between old and new concepts, revealing new meaning as it relates to the domain.

To construct a concept map, it is important to have a good understanding of the domain. If one's understanding of the concepts is limited, it will be difficult to make meaningful interconnections with linking words.<sup>3</sup> Also, articulating the correct focus question is a key step that will provide context and structure to the map. "How do people share pictures" and "How do people want to share pictures" should lead to different maps: the former providing a listing of options, the latter, a more exploratory audit suggesting a range of opportunities.

After a focus question is generated, a list of fifteen to twenty-five concepts should be identified and ranked from general to very specific, as they relate to the focus question. Successful concept maps are organized hierarchically based on this ranking, even if it is just a loose organization at first. Once all of the concepts are ranked, the next step is to initiate the construction of a preliminary map using either paper-based or computer-based tools that make it easy to move concepts around. Ideally, the concepts can be moved around by trial and error until the best hierarchy is reached.

Once a strong map is in place, cross-links identify relationships between subdomains in the map, and linking words articulate individual concepts. This can be the most difficult step for the mapmaker.<sup>4</sup> Finally, revise, reposition, and rewrite until a final map emerges that adequately answers the focus questions. Maps that meet the above criteria should help design teams gain new knowledge, and find new meanings in an information space.

- Behavioral Attitudinal
- Quantitative Qualitative
- Innovative Adapted Traditional
- Exploratory Generative Evaluative
- Participatory Observational Self reporting Expert review Design process

1. While researching how children learn new concepts and information, David Ausubel determined that learning is more meaningful when new information is assimilated into existing frameworks that children already grasp. While seeking a better way to represent the learning process, what emerged was the idea of visually representing children's knowledge in the form of a concept map. See:

Ausubel, David P. *The Psychology of Meaningful Verbal Learning*. New York and London: Grune and Stratton, 1963.

2. Ausubel, David, Joseph D. Novak, and H. Hanesian. *Educational Psychology: A Cognitive View*, 2nd ed. New York: Holt, Rinehart & Winston, 1978.

3. See note 2 above.

4. See note 2 above

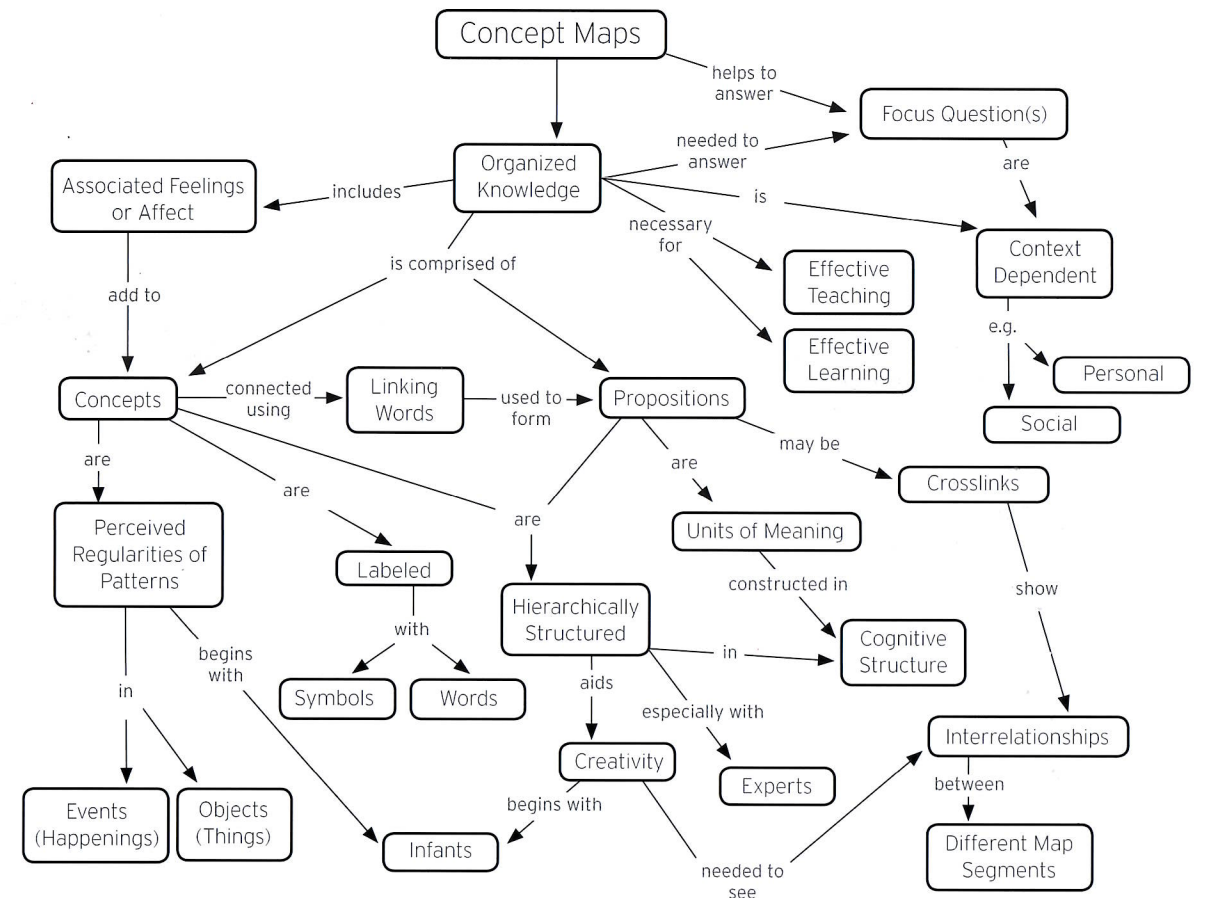
5. Novak, J. D., and A. J. Cañas. "The Theory Underlying Concept Maps and How to Construct and Use Them" in *Technical Report IHMC CmapTools 2006-01 Rev. 01-2008*, Florida Institute for Human and Machine Cognition, 2008, <http://cmap.ihmc.us/Publications/ResearchPapers/TheoryUnderlyingConceptMaps.pdf>

CmapTools, a knowledge modeling kit that is designed to construct concept maps, is available online at [cmap.ihmc.us](http://cmap.ihmc.us).

**Further Reading**

Novak, Joseph D., and D. Bob Gowin. *Learning How to Learn*. Cambridge: Cambridge University Press, 1984.

Preszler, R. W. "Cooperative Concept Mapping Improves Performance in Biology." *Journal of College Science Teaching* 33 (2004): 30-35.



Concept maps are organized in a downward hierarchy, with the focus question at the top of the map and the most general concepts below it.

Concepts are well-understood ideas, objects, or events, connected by *linking words*. When linking words connect two or more concepts, a *proposition* is formed that potentially challenges existing thinking or creates new meaning.<sup>5</sup>

Courtesy of Joseph D. Novak and Alberto J. Cañas. <http://cmap.ihmc.us>

See also *Brainstorm Graphic Organizers • Cognitive Mapping • Mind Mapping*

# 11 Brainstorm Graphic Organizers

Beyond creating lists of new ideas and concepts, brainstorm graphic organizers help in the creation of new knowledge by visually structuring a deep dive into a problem space.

Brainstorming has traditionally been used to spur group creativity with the intention of generating concepts and ideas regarding a specific challenge. "Go for quantity over quality," "withhold judgment and criticism," "build on each other's ideas," and "welcome oddity" are a few of the widely accepted rules of brainstorming.<sup>1</sup> The intention of these guidelines is to create a safe forum for the expression and free association of creative ideas, and quell any inhibitions of the participants by providing a judgment-free zone to explore new concepts.

More recently, brainstorming is also being used to develop one's fluency of thinking.<sup>2</sup> Graphic organizers, or visual representations of knowledge, are frameworks that facilitate teams as they challenge assumptions, experiment with new relationships between accepted components of a problem space, and as they consider unconventional alternatives within a domain.

Design teams can visually communicate the rigor required of most brainstorming sessions using the following visualization frameworks:<sup>3</sup>

**Brainstorming Webs** Use brainstorming webs when developing a central concept or question and identifying its characteristics, supporting facts, and related ideas. Brainstorming webs can be built by either identifying the center first, then all of the extensions, or by identifying all of the components first, then abstracting them to determine overarching central themes.

**Tree Diagrams** Use tree diagrams when you need to communicate hierarchy, a classification system, or relationships between main and supporting ideas. Tree diagrams can be constructed from the top down, or from the bottom up. In this way, they require either inductive or deductive thinking while brainstorming a specific topic.

**Flow Diagrams** Use flow diagrams, or flowcharts, when you need to document a sequence of events, represent the actions or processes of different actors in a system, communicate a process, or show cause and effect of interrelated elements. Flow diagrams usually have a beginning and an end and can support timelines, but they can also be adapted to show cycles for close-looped systems.

The human mind organizes and stores information in a series of networks.<sup>4</sup> Brainstorming webs, tree diagrams, and flow diagrams are three sense-making frameworks that design teams can use to visually brainstorm information in order to disrupt and challenge old patterns of thinking. By using these frameworks, new knowledge and meaning can emerge, with the added benefit that the rigor of the brainstorming session is visually documented within the framework itself.

1. In 1948, *Your Creative Power* by Alex Osborn was published. The book documented the brainstorming technique that had been used at Osborn's famous ad agency, BBDO, since the 1930s. Brainstorming was further popularized in Osborn's book, *Applied Imagination: Principles and Procedures of Creative Problem-Solving*, 3rd ed. Buffalo, N.Y.: Creative Education Foundation, 1993.

2. Hyerle, David. *Visual Tools for Constructing Knowledge*. Alexandria, VA: ASCD, 1996.

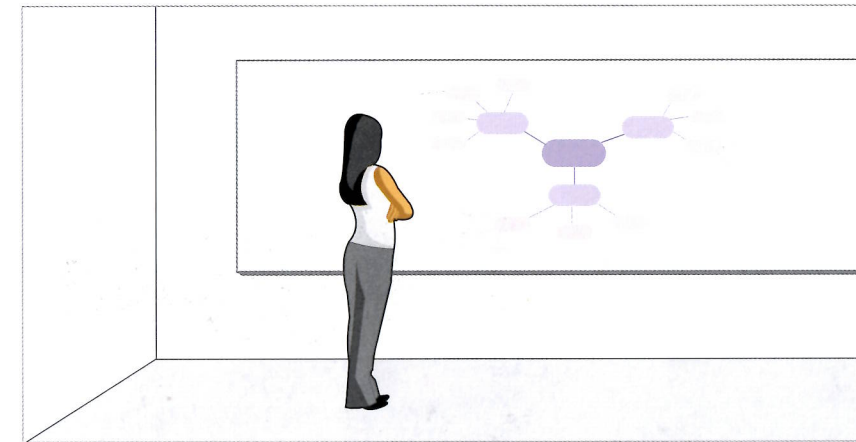
3. See note 2 above.

4. Ausubel, David, Joseph D. Novak, and H. Hanesian. *Educational Psychology: A Cognitive View*, 2nd ed. New York: Holt, Rinehart & Winston, 1978.

**Further Reading**

Clarke, John H. *Patterns of Thinking: Integrating Learning Skills in Content Teaching*. Boston, MA: Allyn & Bacon, 1990.

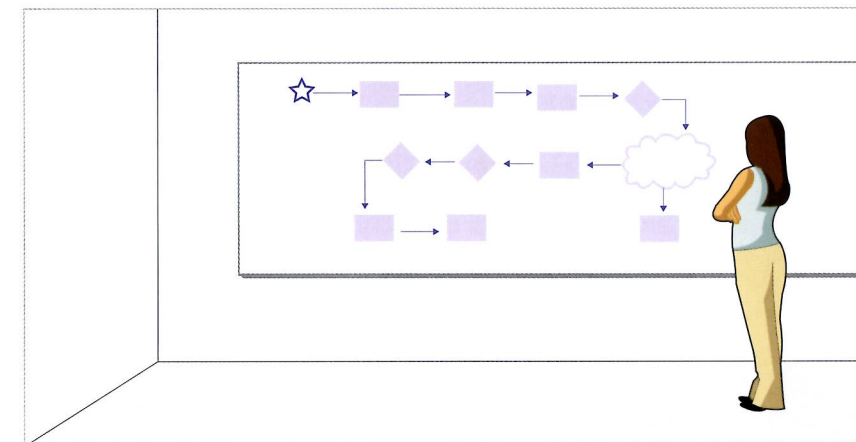
Sinatra, Richard, et al. "Integrating Computers, Reading, and Writing Across the Curriculum." *Educational Leadership* 48 (1990): 57-62.



Brainstorming webs are helpful when developing a central concept or question and its identifying characteristics, supporting facts, and related ideas.



Tree diagrams communicate hierarchy, a classification system, or relationships between main and supporting ideas.



Flow diagrams, or flowcharts, show the actions or processes of different actors in a system, communicate a process, or show cause and effect of interrelated elements within a system.

Behavioral Attitudinal	Quantitative Qualitative	Innovative Adapted Traditional	Exploratory Generative Evaluative	Participatory Observational Self reporting Expert review Design process
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# 24 Content Inventory & Audit

A content inventory tells you what your content is. A content audit makes recommendations as to what your content should be.

Content is more than just text, and it can encompass all the information that you package and publish for your customer's benefit. Everything a customer can read, watch, interact with, or listen to can be considered content, as each of these activities plays an important part in how people will feel about your product or service.

The content inventory and auditing process assumes two things: first, that you have content to index, and second, that you have someone on staff with an affinity for organization and information. If you meet those two requirements, here are a few situations in which to perform an inventory and audit:

- When beginning a website redesign
- When merging multiple sites, or conversely, a site is being split up into smaller, niche sites
- When preparing content for multichannel distribution or a Content Management System (CMS)

A content inventory is a quantitative exercise that aggregates all of your content assets, and is typically organized in a spreadsheet. In content inventory, the spreadsheet's rows usually represent the content items, and columns represent content attributes. During the content inventory stage, the information listed in the table below under "General Information" is recorded.

The content audit is both quantitative and qualitative. The quantitative content audit follows the content inventory, and begins the assessment, or evaluation, of the content using the attributes of "Governance" criteria below. The evaluation of content continues with the qualitative content audit, which rates the criteria in the "Content Quality" column below. The qualitative audit can also identify unifying themes and patterns across content sources.

GENERAL INFORMATION	GOVERNANCE	CONTENT QUALITY (LOW/MED/HIGH SCALE)
Identification/Numbering System	Created by	Credible?
Title/Name	Create Date	Original?
URL or Data Source	Updated Date	Accurate?
Document Type	Owned by	Relevant to Audience?
Comments/Notes	Due Date	Relevant to Business?
	Legal Review Required?	Accessible? (508 Compliance)
	Any TMs or ©	

Although affordable, content inventories and audits can take a lot of time and care to be done well and comprehensively. Once you have established the process, ongoing audits can be used to help you prepare a business case for your next initiative.

- Behavioral Attitudinal
- Quantitative Qualitative
- Innovative Adapted Traditional
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- Participatory Observational Self reporting Expert review Design process

### Further Reading

Halvorson, Kristina. *Content Strategy for the Web*. Berkeley, CA: Peachpit Press, 2009.

Jones, Colleen. *Clout: The Art and Science of Influential Web Content*. Berkeley, CA: New Riders, 2010.

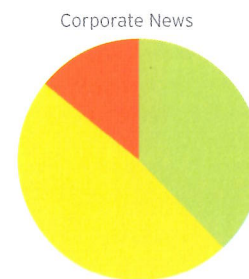
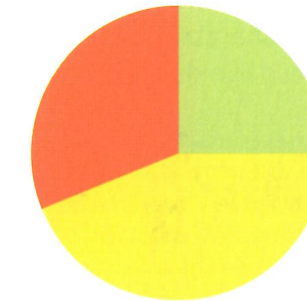
Rosenfeld, Lou. *The Rolling Content Inventory*. 2006, [www.louisrosenfeld.com](http://www.louisrosenfeld.com)

Veen, Jeff. *Doing a Content Inventory (Or, A Mind-Numbingly Detailed Odyssey Through Your Web Site)*. 2002, [www.adaptivepath.com](http://www.adaptivepath.com)

## QUALITATIVE CONTENT AUDIT

Content was rated on: Credibility, Originality, Accuracy, Relevance to Business, Relevance to Audience, and Accessibility.

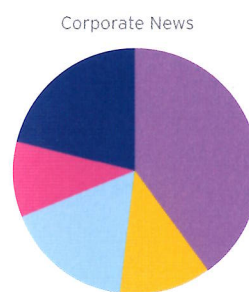
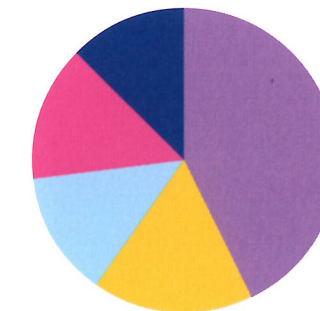
- High quality
- Medium quality
- Low quality



## QUANTITATIVE CONTENT AUDIT

The following content types were identified per each web site section:

- Text
- Infographic or Charts
- Animation
- Video
- Audio



Content inventories and audits can provide both quantitative and qualitative assessments of your current content. Project stakeholders will rarely want to examine spreadsheets to find insights and recommendations, but a few key visualizations can help them understand where their content stands today, and they can begin to get a sense of what has to happen to get it where it needs to be.

*Reporting methodology courtesy of Content Science*

See also Card Sorting • Key Performance Indicators • Site Search Analytics