Faceted Search

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Faceted Search

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SYNTHESIS LECTURES ON INFORMATION CONCEPTS, RETRIEVAL, AND SERVICES # 5

ABSTRACT

We live in an information age that requires us, more than ever, to represent, access, and use information. Over the last several decades, we have developed a modern science and technology for information retrieval, relentlessly pursuing the vision of a "memex" that Vannevar Bush proposed in his seminal article, "As We May Think."

Faceted search plays a key role in this program. Faceted search addresses weaknesses of conventional search approaches and has emerged as a foundation for interactive information retrieval. User studies demonstrate that faceted search provides more effective information-seeking support to users than best-first search. Indeed, faceted search has become increasingly prevalent in online information access systems, particularly for e-commerce and site search.

In this lecture, we explore the history, theory, and practice of faceted search. Although we cannot hope to be exhaustive, our aim is to provide sufficient depth and breadth to offer a useful resource to both researchers and practitioners. Because faceted search is an area of interest to computer scientists, information scientists, interface designers, and usability researchers, we do not assume that the reader is a specialist in any of these fields. Rather, we offer a self-contained treatment of the topic, with an extensive bibliography for those who would like to pursue particular aspects in more depth.

KEYWORDS

faceted search, exploratory search, information seeking, human–computer information retrieval

Preface

We live in an information age, a world where, more than ever, we need to understand how to represent, access, and use information. Over the last several decades, we have witnessed the development of a modern science and technology for information access. We've come a long way from the vision of a "memex" that Vannevar Bush proposed in his seminal article, "As We May Think" [1]: a mechanical device that would allow someone to access a large, self-contained research library.

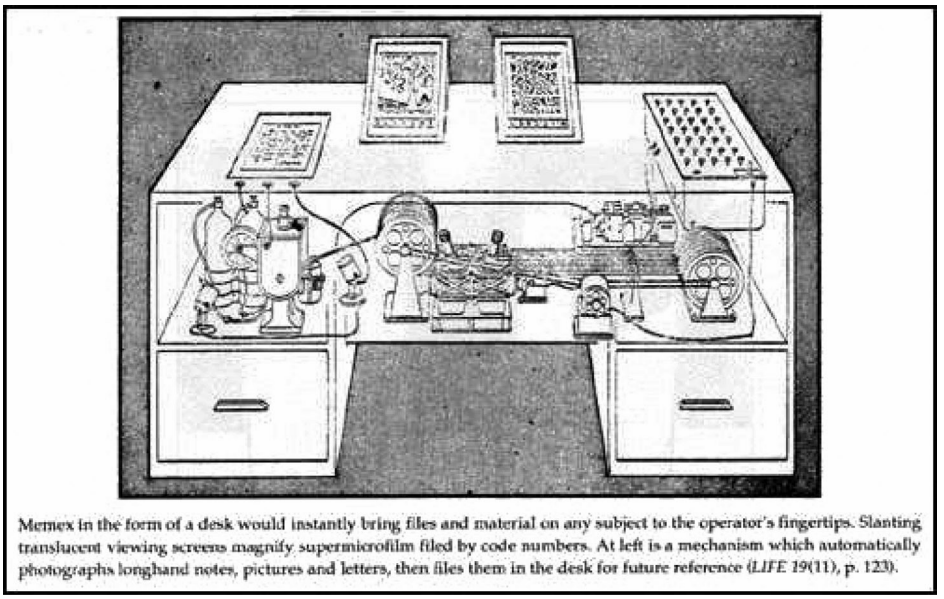
Many people may feel that we have already achieved that end goal, albeit by different means. After all, we can now enter the name of a person or company into Google or some other web search engine and, in most cases, be instantly directed to the associated web page. Thanks to tools like the collectively edited Wikipedia, we may achieve similar success with more general queries, at least for topics of broad enough interest to have inspired Wikipedia entries.

Looking beyond these use cases, however, we see that we are only in the early days of implementing the memex vision (Figure 1). Modern search engines adequately address the problem of what library scientists have historically called known-item search: we know what we are looking for and are certain it exists in the collection we are searching [2].

In contrast, we have not developed comparably mature tools for exploratory search—that is, information seeking where users do not have a known target document and may not even have a well-established information need [4]. Only in the last few years have we seen an emerging program of human–computer information retrieval (HCIR) that brings interactive techniques—many inspired by pre-Internet research in library science—to bear on more sophisticated information-seeking tasks [5].

Facets, a way of classifying information, play a key role in this program. Faceted classification addresses the weakness of earlier knowledge representations—namely, the rigidity of taxonomical schemes and the chaos of unstructured indexes. Developed by library scientists, faceted classification offers an approach to knowledge representation that is both faithful to its richness and practical for real-world use.

Faceted classification, however, only addresses the problem of representing information. We still need a means to access and use that information. That means is faceted search.



Memex in the form of a desk would instantly bring files and material on any subject to the operator's fingertips. Slanting translucent viewing screens magnify supermicrofilm filed by code numbers. At left is a mechanism which automatically photographs longhand notes, pictures and letters, then files them in the desk for future reference (*LIFE* 19(11), p. 123).

FIGURE P.1: Vannevar Bush's theoretical memex machine [3].

Researchers such as Marti Hearst have led the way with user studies that demonstrate how faceted search provides more effective information-seeking support to users than conventional best-first search—even though users are more familiar with the latter [6].

Those dubious of the value of faceted search interfaces raise the specter of what Joshua Porter and his colleagues at User Interface Engineering call the "three-click rule,"—that is, the web design rule of thumb that no piece of content should take more than three clicks to access. Luckily, that bit of folk wisdom does not hold up to empirical study [7]. When tested in a user study, it was found that there is no correlation between the number of times users clicked and their success in finding the content they sought, and that the number of clicks is not what is important to users, but only whether or not they are successful at finding what they are seeking (Figure 2).

In the lecture that follows, we will explore the history, theory, and practice of faceted search. Although faceted search has become increasingly prevalent in online information access systems, this text is, to our knowledge, the first comprehensive treatment of the subject. Although we cannot hope to be exhaustive, our aim is to provide sufficient depth and breadth to offer a useful resource to both researchers and practitioners.

Because faceted search is an area of interest to computer scientists, information scientists, interface designers, and usability researchers, we do not assume that the reader is a specialist in any of

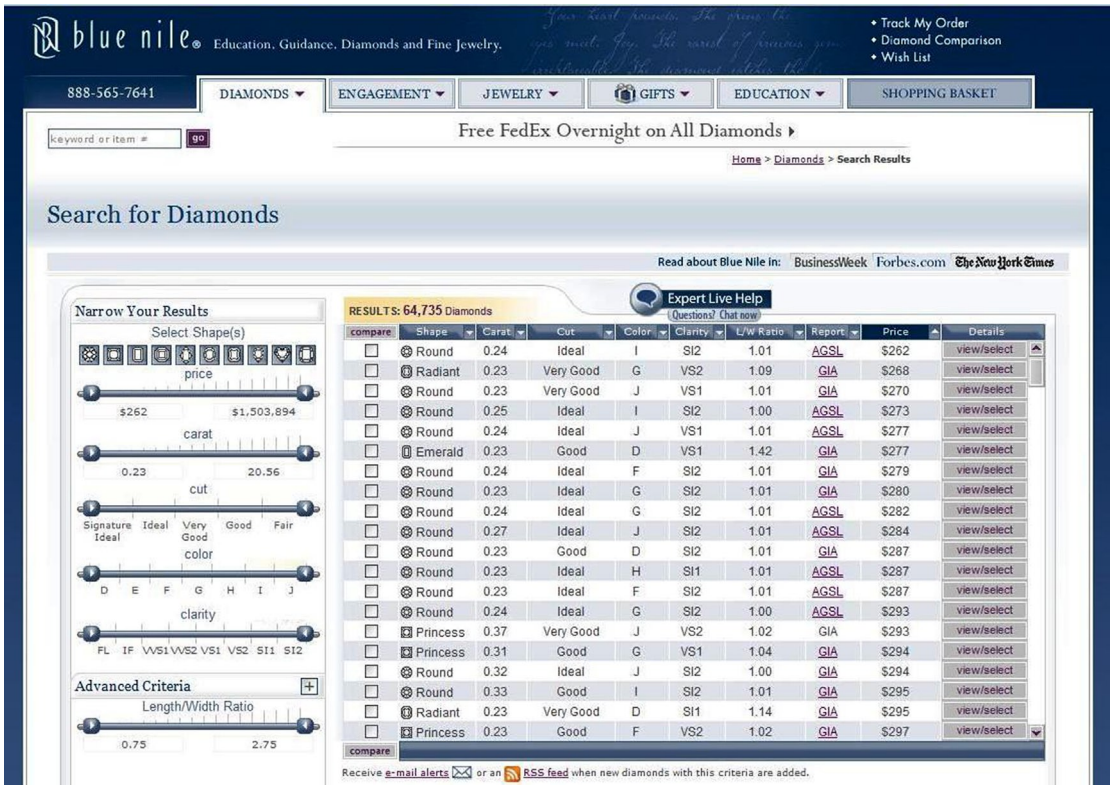


FIGURE P.2: Results for "diamonds" at www.bluenile.com.

these fields. Rather, we offer a self-contained treatment of the topic, with an extensive bibliography for those who would like to pursue particular aspects in more depth.

The book consists of three parts. The first part presents the key concepts leading the reader on a historical path from Aristotle's classical ideas of knowledge representation to a modern-day definition of faceted search. The second part describes key work on faceted search in academia and industry. The third part addresses some of the practical challenges that confront the developers of faceted search applications.

Each chapter ends with take-aways that summarize the chapter's key points. Impatient readers may skip to these, but I hope you will find the journey as valuable as the destination.

Acknowledgments

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