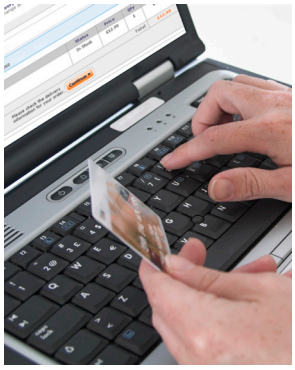
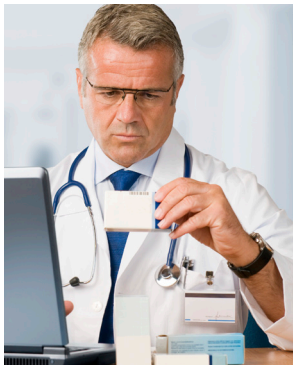
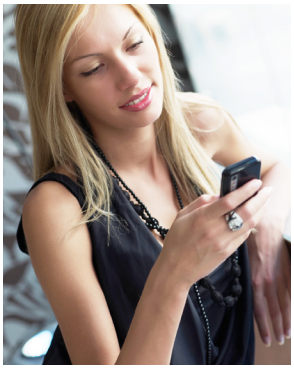
McKinsey&Company

High Tech Practice



The impact of Internet technologies: Search

July 2011

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Preface

This report examines the value of the search technologies used to navigate the Internet and is part of a series that focuses on different, Internet-related technologies.

Online search technology is barely 20 years old, yet it has profoundly changed how we behave and get things done at work, at home, and increasingly while on the go. It empowers people and organizations in every corner of the world. A world without search technology has become unimaginable—so much so that we take it for granted and underestimate its value. Until now, attempts to indicate the worth of search technologies have relied on statistics such as the trillions of online searches made annually worldwide, the billions of dollars advertisers pay to appear on search pages, or the revenue earned by those that provide search capabilities and search marketing services. But these measures fail to fully capture the constant creation of economic value that the click of a search button enables through, for example, improved productivity, more transparency in the marketplace, the discovery of new information, and the ability to link up with the right people and companies. Such benefits are usually attributed to the Internet. But search technologies are a vital cornerstone of the Internet edifice.

The aim of this report is to better assess the far-reaching value of search technologies, looking at how they unlock value and identifying the major beneficiaries. We cast our research net wide, wanting to understand how search technologies affect businesses, individuals, and public service entities, so the report homes in on eleven constituencies—for example, advertisers and retailers in business, and health care and education in public services. It also looks at five countries to show how the use of search technology varies depending upon geography and economic circumstances: to date, much of the analysis has concentrated on the US market. Finally, it identifies nine ways—six more than are commonly acknowledged—in which search technologies create value.[1] Wherever possible, the value created is quantified.

The task is not easy, because a hallmark of search technology is that it is a perpetual work in progress. However, the findings of this report suggest that the value is already large—at the time of the research, some $780 billion annually worldwide, with $540 billion of that amount contributing directly to GDP. It must also be noted that these figures (and those throughout the report) are based on analysis at the time of research i.e. early 2011, using available data mostly 2009 and 2010 data. Still we believe that the $540 billion estimate is conservative. But it is 25 times as great as the profits generated by the search industry alone. These are gross figures. We have not tried to deduct costs. Nor do we examine disruptions in other value chains caused by search technologies or privacy issues. Though these topics are important, they are not the focus of this report. In addition, given the pace at which the search environment develops, we know that the values calculated at the time of the research will already have been surpassed by the time of publication. Nevertheless, to the best of our knowledge, the report is the most comprehensive assessment of the benefits and value of search technologies conducted to date. This report is by no means the last work on the impact of search on the economy—but just the beginning. The technology itself is still relatively early in its evolution, and many more innovations are expected. In addition, the uses and applications of search technology are still emerging, and consequently the impact on business, the economy, and society is still relatively unknown.

This report is an independently authored McKinsey report that draws from research by McKinsey's Technology, Media, and Telecom Practice, academic and public sources, research conducted with Google, as well as research by the McKinsey Global Institute (MGI) to better understand the impact of technology on business and the economy. Other work on the impact of the Internet has been published

1 Some of the nine ways are potentially related but when we are quantifying totals, we are careful not to separate effects into mutually exclusive categories.

by MGI, including an analysis of the Internet's contribution to the global economy[1] and the value that Big Data—that is, the huge pools of information on which much modern economic activity depends—creates for organizations and the economy.[2]

The authors of this report are grateful for the review and comments of Martin Baily, a senior adviser to McKinsey and a senior fellow at the Brookings Institution; Erik Brynjollfson, Schussel Family Professor at the MIT Sloan School of Management and director of the MIT Center for Digital Business; and Hal Varian, chief economist at Google and emeritus professor in the School of Information, the Haas School of Business, and the Department of Economics at the University of California at Berkeley. We are grateful for the vital input and support of leaders in McKinsey's technology, media and telecom practices, including Tarek Elmasry, Adam Bird, Jürgen Meffert, and Geoff Sands.

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1 Matthieu Pélissié du Rausas, James Manyika, Eric Hazan, Jacques Bughin, Michael Chui, and Rémi Said, *Internet matters: The Net's sweeping impact on growth, jobs, and prosperity*, McKinsey Global Institute, May 2011.

2 James Manyika, Michael Chui, Brad Brown, Jacques Bughin, Richard Dobbs, Charles Roxburgh, and Angela Hung Byers, *Big data: The next frontier for innovation, competition, and productivity*, McKinsey Global Institute, May 2011.

Contents

Executive summary	1
Search scale	9
How search unlocks value	15
The value of search: Who benefits and how?	22
The economic value of search	38
The future of search	41
Appendix: Methodology	45
Bibliography	49

Executive summary

For billions of people around the world, the Internet has become an essential component of their everyday social and business lives. And though they seldom give it a moment's thought, the search engines that help them navigate through the plethora of pages, images, video clips, and audio recordings found on the World Wide Web have also become essential. Search technology—shortened simply to "search" in the IT world and referred to as such in the rest of this report—is only two decades old, but it is a cornerstone of the Internet economy.[1]

The numbers prove its utility. In 2010, an average Internet user in the United States performed some 1,500 searches, while some 1.6 trillion searches a year are conducted globally.[2]

Few attempts have been made to assess the value of all this activity. Various reports point to the large amount of money advertisers spend to appear prominently on search pages as an indication of its worth. The profits of those that provide search services—portals, search engines, and search platforms—are another indication. Yet no study has comprehensively assessed the benefits and value of search. This report aims to rectify that, showing how search creates value and who benefits. Where possible, it quantifies the value created. Among our key findings:

- Most work to date has identified three sources of search value: time saved, price transparency, and the raised awareness harnessed by advertisers. Though these are important, they only partially capture the ways in which search creates value, and so underestimate its worth considerably. We identified six more sources of value, and there will undoubtedly be others as search continues to evolve.

- A conservative estimate of the global gross value created by search was $780 billion in 2009. Across the five countries studied, only 4 percent of the gross value created by search was captured by the search industry.

- Worldwide, some 65 percent of search value flowed directly through to GDP in 2009, though the split between developed and developing countries was uneven. Seventy percent of total search value contributed to GDP in the developed countries in the study—the United States, France, and Germany. An average 40 percent contributed toward GDP in the two developing countries in the study—Brazil and India. Put another way, search contributed to between 1.2 and 0.5 percent of GDP in the five countries studied.

- Between 30 and 65 percent of the value of search accrued to individuals rather than companies. In emerging countries such as Brazil and India, people—that is, information seekers and consumers—capture the biggest proportion of the value created by search relative to companies.

- The return on investment (ROI) for those that deploy search are high. Advertisers do well, earning an average ROI of 7:1. Other constituencies fare better still. Based strictly on the value of time saved, individuals in our study—that is, individual information seekers and content creators, consumers, and entrepreneurs—earn an ROI of 10:1 on average. Enterprises earn still more, with an ROI of 17:1 as a result of time saved.

1 Search Engine History: http://www.searchenginehistory.com/.
2 ComScore qSearch.

- Despite the clear, measurable benefits of search to the economy, it would be a mistake to think about search only in terms that are easy to quantify. For example, search helps people find information in times of emergencies and helps them seek out people with similar interests—perhaps a support group for those coping with disease. Search also shifts the balance to empower individuals or small organizations with something to share that would otherwise reach only a small audience. None of these types of benefits may be easy to measure, but they are powerful nevertheless.

- There are, of course costs associated with search. Though we do not examine them deeply in this report, we do recognize potential negative impacts, particularly for individual businesses - e.g., many of the gross benefits come at the expense of other companies, or potential losses where search facilitates piracy or undermines intellectual property protection.

- Search continues to evolve rapidly as a result of changes in user behavior; the content that is searchable; search technology; where search occurs—for example, within social networks and on new devices; and the arrival of new participants in the search market.

Search size

The size of search can be hard to conceive. More than one trillion unique, worldwide URLs were indexed by Google alone by 2010.[3] Some 90 percent[4] of online users use search engines, and search represents 10 percent of the time spent by individuals on the Web, totaling about four hours per month.[5] Knowledge workers in enterprises spend on average five hours per week, or 12 percent of their time, searching for content.[6] The list could go on. People and organizations are in love with the utility of search.

In retrospect, it was inevitable that search would become so big. The power of Moore's and Metcalfe's laws[7] meant that it became easy and cheap to capture, digitize, and store massive amounts of information; the explosive growth of Internet usage meant the creation of still more Web content; and the efficiency of online transactions lured commerce and business online. As a result, a mechanism for discovering and organizing Internet information became imperative, and search was born. Users could now find what they wanted, and providers of information, products, and services could locate the right audience at negligible cost, encouraging still more content.

But the way people search has since added another dimension to its utility. When people search online, they are signaling information about themselves: what they are looking for, when, and in what context—for example, the Web page they visited before and after the search. Such information can be harnessed by those seeking to deliver more relevant content or advertising, often a source of value to providers and search users alike, though it is this dimension that also raises debate about privacy.

How should one think about the value of all this search activity? Often, it is considered in terms of the profits made by the search industry—that is, those that provide search capabilities and search marketing services. A very rough estimate of the industry's profit margins[8] would indicate that, in the United States, an average search is worth three cents in profit to these companies. Yet the figure comes nowhere near to capturing a sense of the real worth of search if you consider even for a moment the very different ways in

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3 http://googleblog.blogspot.com/2008/07/we-knew-web-was-big.html [Retrieved April 29, 2011].

4 ComScore qSearch.

5 McKinsey & Company for IAB Europe, *Consumers driving the digital uptake: The economic value of online advertising-based services for consumers*, September 2010.

6 *The hidden costs of information work*, IDC white paper, March 2005, corroborated by McKinsey primary research.

7 Moore's Law, first described by Intel cofounder Gordon Moore, states that the number of transistors that can be placed on an integrated circuit doubles approximately every two years. In other words, the amount of computing power that can be purchased for the same amount of money doubles about every two years. Metcalfe's Law, attributed to Ethernet inventor Robert Metcalfe, states that the value of a telecommunications network is proportional to the square of the number of connected nodes in the system.

8 Typically, Internet search engines and classified search generate profit margins in the range of 20 to 40 percent, and search engine optimization (SEO) companies generate 10 to 20 percent profit margins (based on McKinsey analysis of returns from public companies in 2008).

which individuals and organizations use it. Much more value is being created in the "search value chain" and captured by market participants outside of the search industry.[9]

How search unlocks value

Most literature to date has looked at and quantified only three ways in which search creates value: by saving time, increasing price transparency, and raising awareness.

Our research suggests this underestimates value creation from search, because there are additional sources of value. Some of these can be estimated in financial terms. Others cannot, either because they are difficult to measure or because they create value to society that may not have direct financial worth. For example, it is hard to gauge the value of search, financial or otherwise, to students in developing economies who find course materials made available online by world-class universities.

In all, we identified nine sources of search value:

- **Better matching.** Search helps customers, individuals, and organizations find information that is more relevant to their needs.
- **Time saved.** Search accelerates the process of finding information, which in turn can streamline processes such as decision making and purchasing.
- **Raised awareness.** Search helps all manner of people and organizations raise awareness about themselves and their offerings, in addition to the value of raised awareness from an advertiser's perspective that has been the focus of most studies.
- **Price transparency.** This is similar to "better matching" in that it helps users find the information they need, but here, the focus is on getting the best price.
- **Long-tail offerings.** These are niche items that relatively few customers might want. With the help of search, consumers can seek out such offerings, which now have greater profit potential for suppliers.
- **People matching.** This again entails the matching of information but this time focusing on people, be it for social or work purposes.
- **Problem solving.** Search tools facilitate all manner of problem solving, be it how to build a chair, identify whether the plant your one-year-old has just swallowed is poisonous, or advance scientific research.
- **New business models.** New companies and business models are springing up to take advantage of search. Without search, many recently developed business models would not exist. Price comparison sites are a case in point.
- **Entertainment.** Given the quantity of digital music and video available, search creates value by helping to navigate content. For a generation of teenagers who pass on TV to watch videos on YouTube instead, search has also enabled a completely different mode of entertainment.

This list is not exhaustive —and there are other sources of value that result from the nine above, e.g., lowering production costs, and speeding innovation, through better matching,

The value of search: Who benefits and how?

Search affects the activities of individuals and all sorts of organizations, so we cast our research net wide when trying to assess its value. We wanted to look at its impact on businesses, individuals, and public service entities, and so we examined 11 constituencies within these main groups—for example, advertisers

9 Profits by search industry are BOTH an over and underestimate of search's value: some profits come at expense of other media; much of value does not convert to profit, e.g., value that accrues to consumers and other businesses.

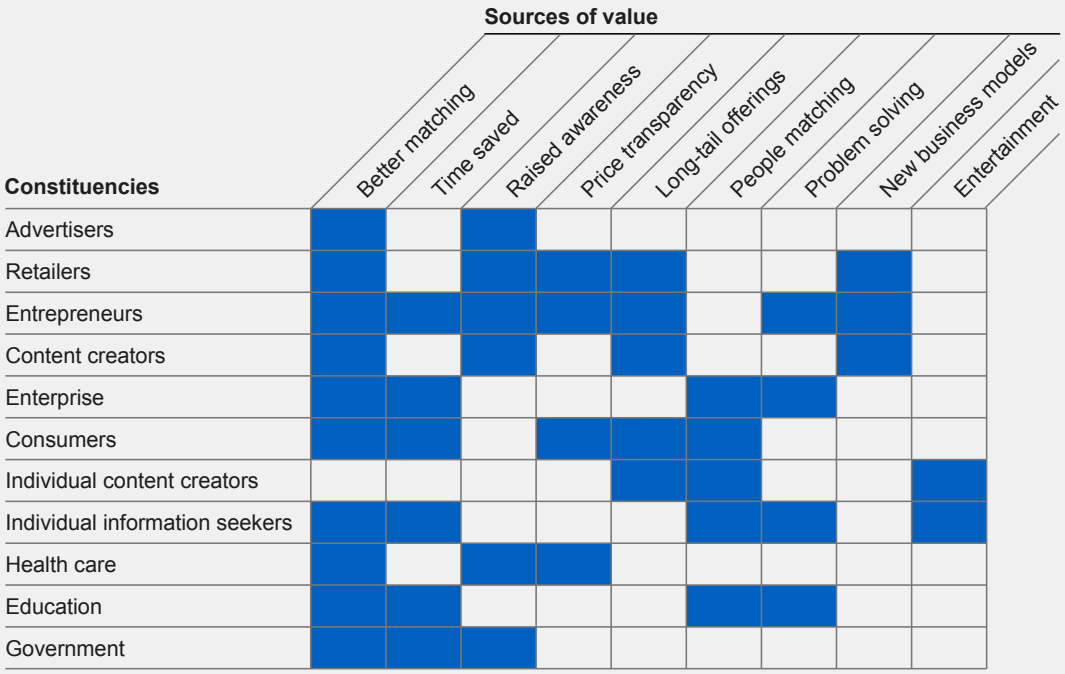
and retailers in business, and health care and education in public services—analyzing how the nine sources of value affected each.

The results should be regarded as case studies that demonstrate the value of search rather than as a fully exhaustive analysis. If the task of quantification was too uncertain for some sources of value—such as calculating the value of better matching for retailers—or if the value was likely to be minor, it was not included in our analysis.

The study showed that value accrues to all constituencies. The three most-studied sources of search value—time saved, raised awareness, and price transparency—are important. However, the study illustrated the additional impact of the other six sources of value, emphasizing the extent to which previous views of how search creates value have been too narrow. Exhibit 1 describes the sources of value for each constituency.

Exhibit 1

Primary sources of value from search



SOURCE: McKinsey analysis

Here are some examples of how the different constituencies benefit from search:

- The value of search to retailers was estimated in 2009 at 2 percent of total annual retail revenue in developed countries and 1 percent in developing ones. That is equivalent to $57 billion to $67 billion in the United States and $2.1 billion to $2.4 billion in Brazil.[10]

- Search-enabled productivity gains enjoyed by knowledge workers in enterprise were worth up to $117 billion in 2009 in the five countries studied. The figures ranged from $49 billion to $73 billion in the United States to $3 billion to $4 billion in Brazil.[11]

10 Estimated based on three methods: the methodology in Hal R. Varian, "Online ad auctions," *American Economic Review: Papers & Proceedings 2009*, Volume 99, Number 2, pp. 430–34; McKinsey primary research in its digital marketing survey in 2007; and comScore and Nielsen data on total searches with an applied conversion rate.

11 Estimated based on 10 to 15 percent productivity gain for knowledge workers in each country; number of knowledge workers based on International Labor Organization figures for France and Germany and McKinsey estimates; hourly wages based on IDC data.

- We calculated that the value created for consumers was worth around $20 per consumer per month in France, Germany, and the United States in 2009, and $2 to $5 in India and Brazil.

- Depending on geography, 30 to 60 percent of all Internet users—that is, some 204 million people in the five profiled countries—create their own content.[12] The shares are higher in developing countries than in developed countries. It is hard to measure the value of search to these people, to the extent it helps make their voices heard. However, the sheer number of those who create content to express themselves in one way or another helps explain the power of social networks to influence social dynamics around the globe.

The economic value of search

Just how much is search worth? To date, no one has looked at its economic contribution at a country level, let alone a global level.

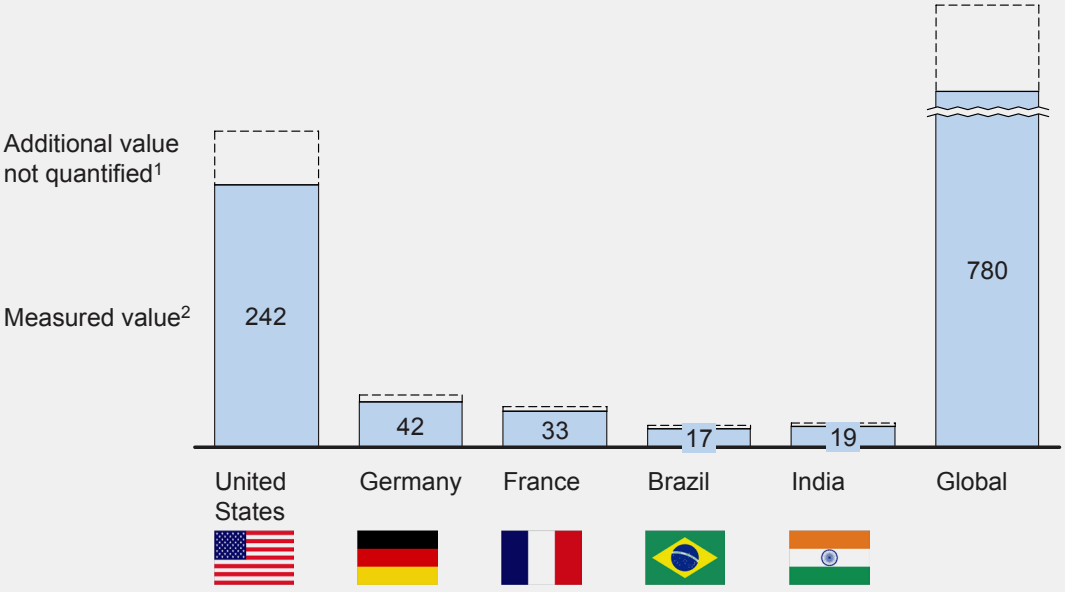
The analysis showed that search activity had measurable impact approaching gross annual value of $780 billion in 2009,[13] similar to the GDP of the Netherlands or Turkey,[14] and making each single search worth around $0.50.[15] It should be remembered that this is only a partial estimate of the gross value of search, limited as our research was in terms of the number of constituencies and sources of value analyzed. In addition, the speed at which the search environment grows makes it likely that this figure has already been surpassed. Exhibit 2 shows how the value was divided among the five countries studied.

Exhibit 2

Gross value created by search across countries, 2009

ESTIMATES

USD billions



1 These are only estimates and should not be taken out of context of the accompanying text.
2 These values are conservative. They include only quantified estimates and do not include value that we did not quantify, such as the improvement in the quality of a consumer's shopping experience from better matching.

SOURCE: McKinsey analysis

12 eMarketer.
13 Estimated in 2009 dollars, calculated by applying average percentage of GDP attributed to search of France, Germany, and the United States to all developed countries and average percentage of GDP attributed to search to all emerging countries; McKinsey analysis. Note that this gross annual value includes value that is not captured in GDP statistics (e.g., consumer surplus), and that the portion that is captured in GDP statistics includes both the direct contribution of Internet sales and the indirect contribution of offline sales influenced by the Internet.
14 International Monetary Fund.
15 ComScore qSearch estimates 1.6 trillion searches conducted per year.

Not all of this value shows up in GDP[16]—e.g., many consumer benefits, such as lower prices or the time consumers save, are not captured in these numbers. Some of these are likely to have an indirect impact on GDP. Some sources of value in education and health care that we did not quantify also boost GDP indirectly. The estimate of GDP impact should therefore be taken as conservative. It is nevertheless significant. The research showed gross value of $540 billion, or 69 percent of the measurable value, flowing through to GDP. This is roughly the nominal size of the global publishing industry in 2010[17] or Switzerland's GDP in 2010.[18]

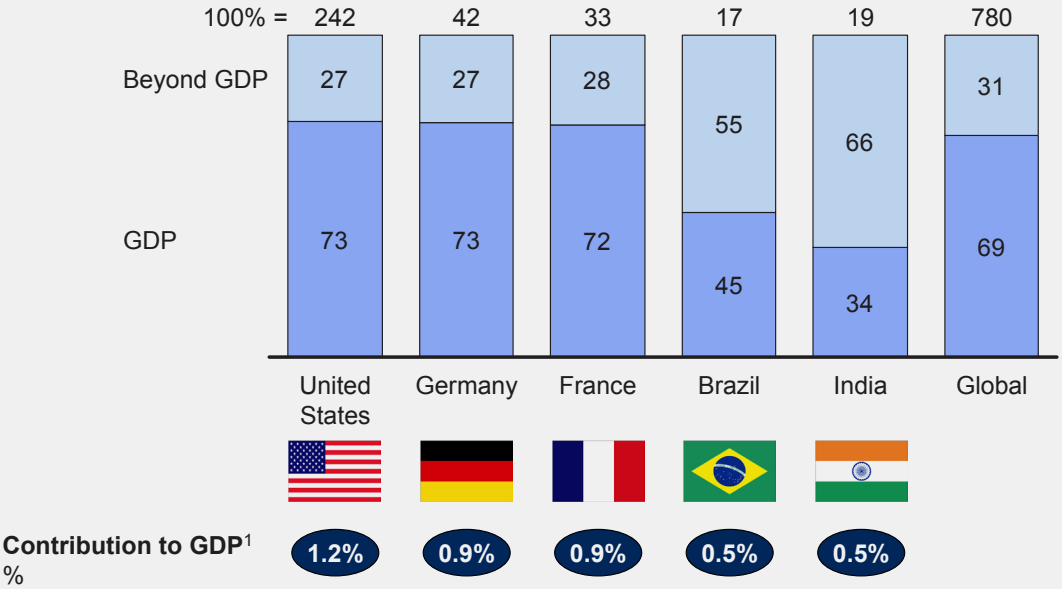
Exhibit 3 shows that this represents between 0.5 and 1.2 percent of GDP in each of the countries studied.

Exhibit 3

Value created by search across countries, 2009

ESTIMATES

Measured value
%; USD billions



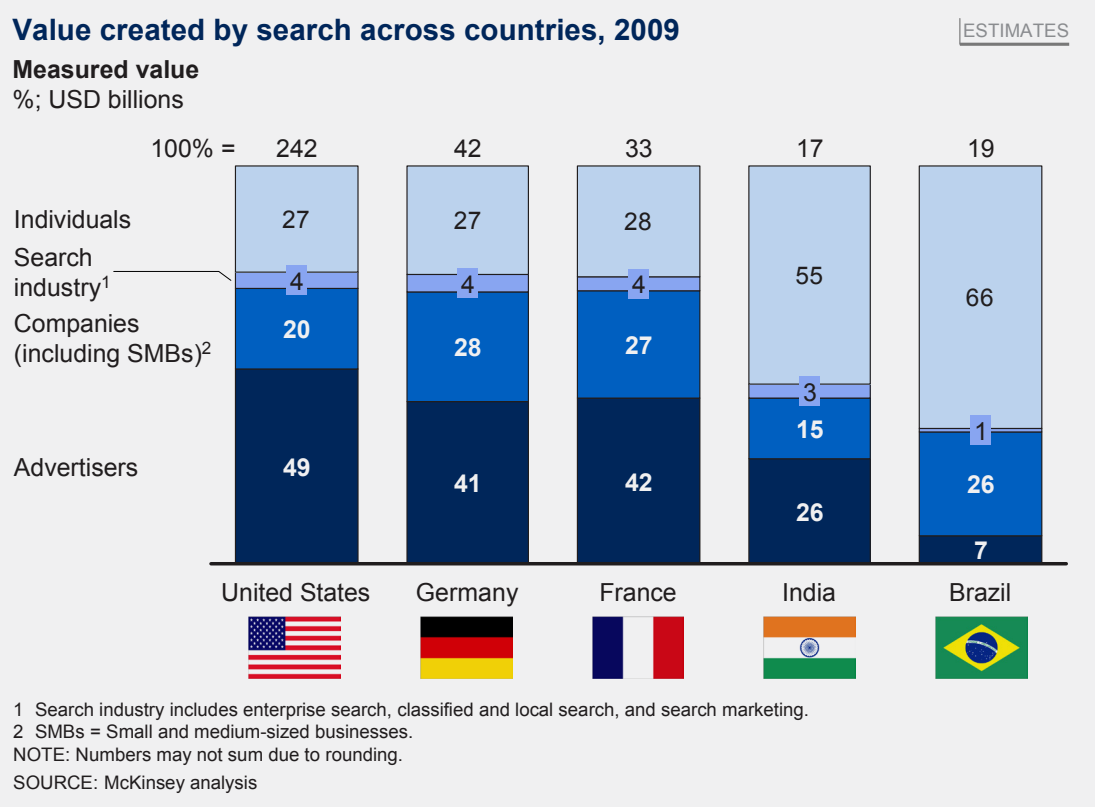
1 Represents only the portion of value that is attributable to GDP (e.g., the 73% of $242 billion in the United States).
SOURCE: McKinsey analysis

The difference in the extent to which search contributes to GDP in developed and developing countries—around 70 percent and 40 percent, respectively—can be explained by the much larger percentage of total value that is captured in developing countries as a consumer surplus, which is not included in GDP. This is reflected in Exhibit 4, showing that in the developed countries studied, individuals capture around 30 percent of measurable search value. In developing countries, the figure is around 60 percent. The exhibit also indicates the extent to which search value is underestimated if the gauge to profits earned by the search industry is narrowed. Only 4 percent of the value measured is captured by that industry globally.

Despite the clear benefits of search to the economy, it would be a mistake to think about search only in monetary terms. Search assists people in myriad ways in their daily lives. It helps them to find information in times of emergencies, for example, and to seek out people with similar interests—perhaps a support group for those coping with disease. Importantly, it also shifts the balance to empower individuals or small organizations with something to share that would otherwise reach only a small audience. None of these may have economic value, but they affect people's lives.

16 We estimated GDP impact using an income approach.
17 Global Insights, Q2 2011 forecast. Includes publishing of books, brochures, musical books, newspapers, journals and periodicals, recorded media, and other publishing.
18 International Monetary Fund.

Exhibit 4



1 Search industry includes enterprise search, classified and local search, and search marketing.
2 SMBs = Small and medium-sized businesses.
NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey analysis

The future of search

The future of search remains hard to predict given the pace of change, but the value of search will only grow as we come to rely upon it more and more.

Search is at an early stage of its evolution. Searches for video or photographic images still largely depend on text searches by file names or key words, not image searches, for example, and technologies capable of capturing an image or sign in one language and translating it into another remain rudimentary. All this is work in progress.

But search's main challenge going forward will be to keep pace with what it has helped unleash, namely more and more online content: one study estimated that the amount of digital information will grow by a factor of 44 annually from 2009 to 2020.[19] Amid the trillions of gigabytes, the task of search technology will be to make sure the search is still quick and the results relevant.

Accordingly, the use of vertical search engines is on the rise. Ten times as many product searches are now executed on Amazon and eBay, both vertical sites, as on Google Product Search,[20] for example. Interest in semantic search engines, which try to understand more accurately the underlying intent of a search, also is on the rise.

Importantly, relevant search results are increasingly deemed to be personalized. Autonomous search agents that make suggestions based on personal data, including the user's location, metadata, and more advanced algorithms, are in sight, and key players in the search industry now use the data available on social networks to enhance search results. Some 30 percent of US Internet users now use social networks to find content, and 21 percent use them to find videos.[21]

19 IDC Digital Universe Study, sponsored by EMC, May 2010, http://www.emc.com/about/news/press/2010/20100504-01.htm.
20 ComScore qSearch.
21 eMarketer 2009.

The advent of smartphones, tablets, and other Web-connected portable devices also increases the potential of more personalized searches. And as search continues to grow, new applications will emerge. Already, analysis of what people are searching for is being used to better understand current trends and future outcomes in society. Researchers have, for example, looked at how search activity can help predict epidemics, unemployment, consumer demand, or even stock prices.

So what does all this mean for all those who participate in the search market?

Both individuals and organizations have much to look forward to. They will be able to search more quickly and more easily than before, and they can expect increasingly relevant results. But participants in the search industry are in for a turbulent ride. The competition is fierce, and as technology change accelerates, incumbents will be constantly challenged and disruptive change will become the norm.

Policy makers will also find themselves challenged as search gives rise to a whole host of issues that are difficult to arbitrate, given the ease with which information can be accessed through search. Privacy often grabs attention. But other salient issues include copyright and trademark infringement as well as censorship,[22] making search one of the toughest issues confronting technology policy. Any attempt by policy makers to arbitrate the interests of the different parties in the fast-paced, virtual world will likely leave them playing catch-up.

Researchers, too, will lag behind, trying to make sense of it all. But amid all the uncertainty, one thing is sure: the full implications of search on economies and societies are only now beginning to be revealed.

22 Hannibal Travis, "The future according to Google: Technology policy from the standpoint of America's fastest-growing technology company," *Yale Journal of Law & Technology*, Spring 2008–09, Volume 11.

Search scale

For billions of people around the world, the Internet has become an essential component of their everyday social and business lives. And though they seldom give it a moment's thought, the search engines that help them navigate through the plethora of pages, images, video clips, and audio recordings found on the Web have also become essential. Search technology—shortened simply to "search" in the IT world and referred to as such in the rest of this report—is only two decades old, but it has become a cornerstone of the Internet economy.

People and organizations are in love with its utility. In January 2011, 200 million Americans, 40 million French, and more than 50 million Germans conducted online searches.[23] More than 1.6 trillion searches a year are currently conducted globally.[24]

And consider the following:

- By July of 2008, more than one trillion unique URLs were indexed by Google,[25] the number having grown by 44 percent[26] annually during the preceding ten years. The growth of other major search engines such as Bing and Yahoo! is similarly large.
- Some 90 percent[27] of online users use search engines—that means 1.7 billion people.[28]
- Search represents 10 percent of the time spent by individuals on the Web, totaling about four hours each a month.[29]
- Approximately 25 percent of the traffic to the Websites of mainstream content creators results is referred by search engines.[30]
- Knowledge workers in enterprises spend on average five hours per week, or 12 percent of their time, searching for content.[31]
- Depending on the geography, 30 to 60 percent of all Internet users post content online, in the knowledge that search will help ensure that their voices are heard. That is more than 200 million people in the five profiled countries.[32]

People use search in all aspects of their lives. (See Box 1, "Search scope," for a definition of how search is defined for the purposes of this report.) Worldwide, by early 2011, some 38 percent of searches were work-related, up from 34 percent the previous year.[33] To many workers, including lawyers, investors, managers,

23 ComScore qSearch.
24 ComScore qSearch.
25 The Official Google Blog, July 26, 2008.
26 The Official Google Blog, July 26, 2008 (data from 1998 to 2008).
27 ComScore qSearch.
28 ITU World Telecommunication/ICT Indicators database.
29 McKinsey & Company for IAB Europe, *Consumers driving the digital uptake: The economic value of online advertising-based services for consumers*, September 2010.
30 McKinsey US clickstream data, 2009.
31 *The hidden costs of information work*, IDC white paper, March 2005, corroborated by McKinsey primary research.
32 eMarketer.
33 ComScore qSearch.

entrepreneurs, doctors, educators, and journalists, search has become indispensible. A survey of biology teachers in the United States, for example, found that 90 percent used search engines to find presentation materials such as photos, audio, and other curriculum content and that 80 percent used them to plan daily lessons.[34]

The use of search outside of work also continues to grow, though less quickly, and is the starting point for many Web activities. For example, 82 percent of US Internet users start with a search engine when they look for public information or complete a transaction with a governmental entity, while 80 percent use a search engine as a starting point for health queries.[35]

All of this search activity takes place in a world where only around 30 percent of the population has Internet access[36]—though lack of access is not always an impediment to be able to search. Justdial is an Indian company that enables users to phone and ask an operator to conduct a search on their behalf, overcoming access as well as literacy problems. Justdial receives some 250,000 phone calls and conducts more than 210,000 Web searches each day.

In retrospect, it was inevitable that search would become so powerful, given the forces at work. First, the power of Moore's and Metcalfe's laws[37] meant it became easy and cheap to capture, digitize, and store information. Second, the explosive growth of the Internet in terms of reach and usage generated still more users and content. And third, the efficiency of online transactions and the exchange of information and content lured commerce and business onto the Internet.

As a result of these forces, users needed a mechanism for finding and discovering information on the Internet. Early attempts to impose some order on it all mimicked the physical world in the form of online directories and catalogs, though these were soon overwhelmed by the scale and dynamism of online information. And so online search was born. (See Box 2, "A history of search.") Users could now find what they wanted, while providers of information, products, and services—be they individuals or organizations—could locate the right audience at negligible cost.

But users' online behavior has since added another dimension to its utility. When people search online, they are signaling information about themselves: what they are looking for, when they are looking, and in what context—for example, the Web page they visited before and after the search. Such information can be harnessed by those seeking to deliver more relevant content or advertising, often a source of value to providers and searchers alike. This dimension also raises concerns about privacy. Some research has been conducted into the value users put on their privacy—that is, how much they might pay to protect their online information.[38] (Given that privacy issues are extensively discussed elsewhere, they are not the focus of this report.)

How should one think about the value of all this search activity? Most often, it is considered in terms of its value to the search industry—that is, enterprise search, classified and local search, and search marketing. Together, these three segments earned estimated revenue in 2010 of some $20 billion in the United States and $40 billion worldwide.[39] (See Box 3, "The money in the search industry.") A very rough estimate of their profit margins[40] would indicate profits of about $8 billion for US search companies. Divide this by the

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34 Anne Marie Perrault, *An exploratory study of biology teachers' online information-seeking practices*, American Association of School Librarians, 2009.

35 Pew Internet and American Life Project, 2010.

36 International Telecommunication Union data on Internet usage, http://www.itu.int/ITU-D/ict/statistics/; population data from the World Bank, http://data.worldbank.org/data-catalog.

37 Moore's Law states that the number of transistors that can be placed on an integrated circuit doubles approximately every two years. Metcalfe's Law states that the value of a telecommunications network is proportional to the square of the number of connected nodes in the system.

38 McKinsey & Company for IAB Europe, *Consumers driving the digital uptake: The economic value of online advertising-based services for consumers*, September 2010.

39 McKinsey analysis based on MAGNAGLOBAL, *Global ad spend by channel, including mobile, 2000–2016*, December 2010.

40 Typically, Internet search engines and classified search generate profit margins in the range of 20 to 40 percent, and SEO companies generate 10 to 20 percent profit margins (based on McKinsey analysis of returns from public companies in 2008).

number of search queries in the United States that same year (about 270 billion), and the profit per query is worth about three cents to these companies.

Yet this comes nowhere near to capturing a sense of the real worth of search if you consider even for a moment the very different ways in which individuals and organizations use search and why they value its utility. Much more value is created in the "search value chain" and captured by many more market participants. Hence the need for a more thorough assessment of the value of search, which this report aims to help meet.

Box 1. Search scope

Search is defined broadly. It includes any online search activity using general, horizontal Web search engines, such as Google and Yahoo!, and specialized, vertical ones, such as Amazon or YouTube. It also includes consumer searches and those conducted by people in businesses. It covers searches of all types of media, including text, images, and video, and through any type of device, including personal computers and mobile devices such as smartphones. Currently, about a third of all searches are done at work, while the daily number of vertical searches conducted in the United States already exceeds the daily number of searches performed on any single, major, horizontal Web search engine such as Google or Bing.[1] Thus the need to define search broadly. However, we do not include in our estimates of search the impact of pure recommendations from other users or simple browsing (i.e., following links not generated by entering search terms) through a Web site.

Most analysis of the value of search has concentrated on the US market. This report includes four more countries—Brazil, France, Germany, and India—to give a view of how search might vary depending on geography and economic circumstances. The United States, Germany, and France can be considered leading-edge countries in terms of Internet accessibility and usage. India and Brazil are examples of up-and-coming economic powers where a relatively small segment of the population is currently active online. Adding search activity in Brazil, France, Germany, and India to that in the United States more than doubles the sample size of searches.

The report also includes mobile phone searches and those conducted on other mobile devices such as tablets.

Finally, we have assessed the value of search for a relatively large set of constituencies, including individuals and organizations, and examined a wide range of sources of value. Much previous research has focused on providers of search services, particularly advertisers. Yet our analysis suggests that search advertising accounts for less than 40 percent of the total value derived from search.

The research was conducted in the first quarter of 2011.

1 ComScore qSearch.

Box 2. A history of search

Search had its conceptual beginnings in the 19th century, when pioneers such as Belgian Paul Otlet pondered how to collect and organize the world's knowledge. In 1895, Otlet began a classification system using index cards, a system that was to become ubiquitous in libraries around the world. He hired a staff whose job was to read books, write the facts on the index cards, and cross-reference them. The filing cabinets in his warehouse were stuffed with more than 15 million index cards before many were destroyed in World War II, but he had a grander vision still that presaged today's search capabilities. He sketched out plans for a system in which people would be able to search through millions of interlinked documents and images from a great distance through what he envisaged as "electric telescopes." He described how people would use the devices to send messages to one another, share files, and even contribute to social networks—able to "participate, applaud, give ovations, and sing in the chorus." He called the whole thing a "réseau," or network, whereby "anyone in his armchair would be able to contemplate the whole of creation."[1]

Fast forward to 1969 and ARPANET, the network sponsored by the US military's Defense Advanced Research Projects Agency for computers to communicate with each other, and the core of what became the global Internet. Over time, the nodes on the network became thousands of large computers. And as other, similar data networks emerged around the world, and as they were hooked up to a much larger, collective Internet, it became increasingly difficult for people to find information.

The problem got worse when the Internet went mainstream with the development of the "World Wide Web" in the early 1990s. Before then, the Internet was mainly the province of scientists and researchers who did not regard it as a mass medium. It made the transition when a set of standards was created and a new class of easy-to-use applications called "Web browsers" was developed. These included the ability to easily display images as well as text and to follow links between pieces of content.

To cope with the subsequent proliferation of content, many hierarchical directories of information were developed, such as Yahoo!, which debuted in 1995, in which information was maintained and edited manually. Computer scientists soon began to develop automated ways to locate specific information on the Web—the needle in a haystack of hundreds of thousands of institutional computers, and tens of millions of smaller servers and personal computers that had become part of this fast-growing network. Search tools became a necessity for such an enormous network to be usable.

Most algorithmic search engines work more or less the same way: they employ software robots that "crawl" through the text of Web pages and index where particular words or groups of words show up. Many engines based on this technology, including WebCrawler, Lycos, AltaVista, and Excite, emerged in the mid-1990s, often combined with directories. In addition, online companies such as Amazon and eBay built internal product search algorithms that focused on their own universe of items, sellers, and customers.

Google's search engine had its origins in 1996, as a graduate student project at Stanford University. What made it different from other Web-indexing engines was that it also analyzed how many other Web pages linked directly to a page that included the search terms. The idea behind this analysis, dubbed PageRank,[2] is that the more a page is linked to by other pages, the more relevant other users find it. Thus, search engines aggregate and leverage the collective votes of millions of web page creators each time they provide a link to a particular page as a source of information on a particular topic. Consequently, it ranks higher in the search results.

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1 Alex Wright, "The Web time forgot," *New York Times*, June 17, 2008, http://www.nytimes.com/2008/06/17/health/17iht-17mund.13760031.html

2 Sergey Brin and Lawrence Page, *The anatomy of a large-scale hypertextual Web search engine*, Proceedings of the Seventh International Conference on World Wide Web (WWW), Brisbane, Australia, 1998, pp. 107–117, http://dbpubs.stanford.edu:8090/pub/1998-8.

Box 2. A history of search (continued)

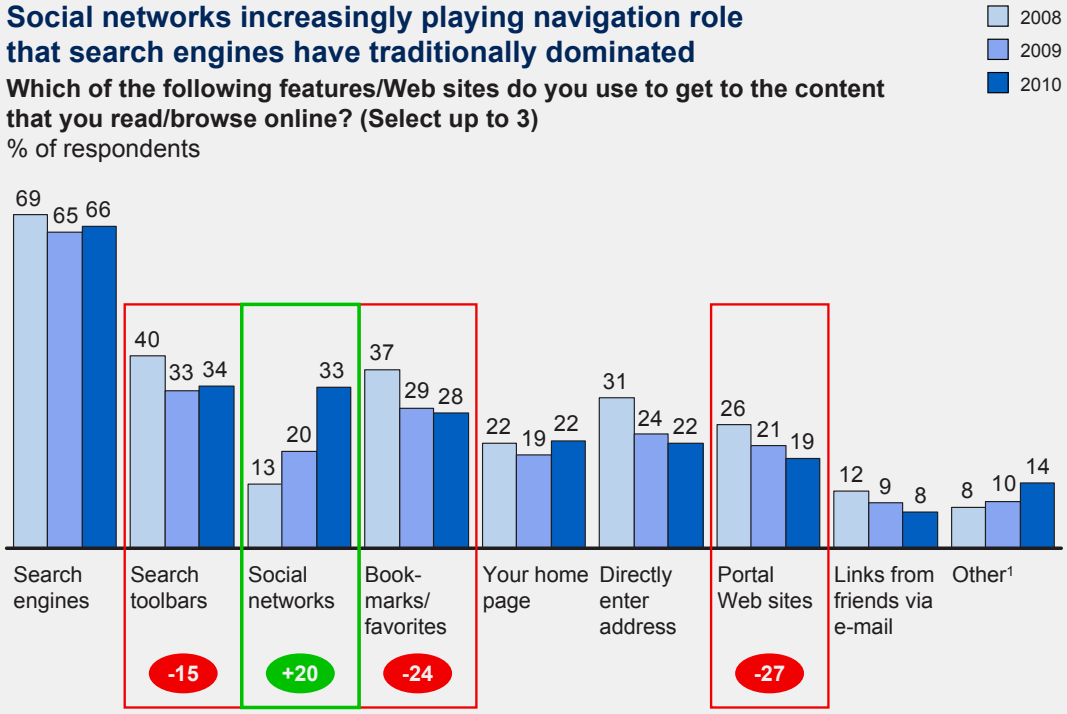
The term "social search" began to emerge around 2004. Results from a social search give more visibility to content created or touched by other people, especially those in a user's network, perhaps because it has been bookmarked or tagged, for example. This means it is likely to be more relevant to the user. Services such as del.icio.us and Reddit aggregate the "social bookmarks" from large numbers of people to suggest content. Users are increasingly navigating to Web sites from links on social networks, a role that search engines had traditionally dominated (see Exhibit 5). Algorithmic search engines are now starting to incorporate social cues—for example, information about content that users have tagged—into their relevance-ranking algorithms.

Exhibit 5

Social networks increasingly playing navigation role that search engines have traditionally dominated

Which of the following features/Web sites do you use to get to the content that you read/browse online? (Select up to 3)

% of respondents



1 Other includes widgets on personal home page, social bookmarking tools, RSS feeds, and other.

SOURCE: McKinsey iConsumer surveys 2008–2010, US 13- to 64-year-old Internet users

Box 3. The money in the search industry

The search industry comprises three main segments: enterprise search, classified and local search, and search marketing. Together they earned revenue of $40 billion worldwide in 2010.

Enterprise search

Companies that rely heavily on knowledge workers often invest in their own enterprise search capabilities to enhance the productivity and competitiveness of their staff. Others use third-party providers such as Endeca, Autonomy, Microsoft, and Exalead. In the United States, the third-party enterprise information management market was estimated to be worth $1.2 billion by 2010.[1] The global third-party enterprise search market is estimated to be worth $2.8 billion.

Classified and local search

This segment includes those that provide search capabilities for sites that classify content into particular categories, such as yellow and white page directories that have moved online, and recruiting and travel Web sites. Online searches have become by far the most common way of consulting directories, and online classified advertisements account for 80 percent of total listings.

The online classified market was worth about $2.6 billion in the United States in 2010,[2] in a global market worth approximately $8 billion. The United States accounted for 65 percent of revenue in this segment of the five countries analyzed.

Fixed-price placement of advertising in the classified database is still the largest source of revenue for participants in this segment, though it is losing ground to a model in which advertisers pay per click on their ad and/or bid for a certain key word. About 20 percent of revenue originated from the latter revenue model in the United States in 2008.[3] By 2010, the proportion had reached 40 percent.

Search marketing

This segment includes search engine providers that earn advertising revenue and companies that provide search engine optimization (SEO) services. It is by far the largest segment of the three, accounting for about 70 percent of total revenue.

In most advanced Internet markets such as North America and the United Kingdom, almost 80 percent of companies market their products and services online.[4] They allocate a significant portion of their online marketing budget either to paid searches, in which they pay to have their sites appear in a prominent place on the search results page, or SEO, which helps them figure out which key words will get them higher on a search list after what is known as a "natural" key word search.

Revenue from key word search spending has been growing at 20 percent a year globally,[5] to become the largest form of online advertising spending—close to 50 percent in Europe.[6]

The market for paid searches and SEO was estimated at $15 billion in the United States and $30 billion worldwide in 2010.[7] US revenue accounted for some 80 percent of total revenue in this segment in the five countries analyzed.

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1 Institute for Prospective Technological Studies, *Economic trends in enterprise search solutions*, European Commission Joint Research Center, http://ec.europa.eu/dgs/jrc/index.cfm?id=1410&obj_id=10930&dt_code=NWS&lang=en.

2 MAGNAGLOBAL, *US media advertising revenue forecast*, January 18, 2011; *Screen Digest* data on global online classifieds and directories advertising revenue by country.

3 Borrell Associates.

4 Econsultancy, *UK search engine marketing benchmark report*, June 2010, http://econsultancy.com/us/reports/uk-search-engine-marketing-benchmark-report.

5 *Global ad spend by channel, including mobile, 2000–2016*, MAGNAGLOBAL, December 2010.

6 Internet Advertising Board Europe, *The online ad market continues to grow despite the recession*, http://www.iabeurope.eu/news/europe%27s-online-ad-market-continues-to-grow-despite-the-recession.aspx.

7 Econsultancy in association with SEMPO, *State of search engine marketing report 2010*, 2010, http://www.sempo.org/resource/resmgr/Docs/State-of-Search-Engine-Marke.pdf.

How search unlocks value

How does an online search create value? Most research to date has looked at and quantified only three main sources of value: time saved by the searchers, money saved by consumers through greater price transparency, and the return on investment (ROI) for advertisers.

A few studies have been conducted on the first of these, time saved. One study[41] found that a successful search for academic information online took, on average, one-third of the time of a similar search in an academic library, though this did not account for the time it might take someone to travel to a library. Other studies describe how shoppers regard time saving as one of the major benefits of searching for products online.[42]

More research has examined the impact of search on product prices because of the increased transparency it enables, and several studies have researched the value derived by advertisers for paid searches—that is, paying to have their Web sites appear prominently in search results—looking at the value derived from raised awareness as well as sales.

There are several additional ways in which search can create value, some of which can be measured in financial terms, and others that cannot. In all, we identified nine sources of search value that together start to reveal its true scale. Here we define each in turn and give examples that indicate the breadth of ways in which each creates value.

Nine sources of value

Better matching

Search helps customers, individuals, and organizations find information, products, and services that are relevant to their needs, and it helps those with something to offer locate the right audience or customers.

The value that search creates by pushing prices lower is considered separately.

Examples of value creation through better matching include:

- In the United States, the National Suicide Prevention Lifeline reported a 9 percent increase in legitimate calls to its hotline after links were displayed in search results pages in response to searches that included key words such as emergency, suicide, or poison.

- In a study of 1,275 consumers in four retail categories—clothing and footwear, beauty and skin care, DIY hardware, and kitchen and bathroom renovations—consumers who used the Internet to search for product information prior to making a purchase in a physical store spent more money than those who did not.[43]

41 Yan Chen, Grace YoungJoo Jeon, and Yong-Mi Kim, *A day without a search engine: An experimental study of online and offline search*, working paper, School of Information, University of Michigan, 2010, http://yanchen.people.si.umich.edu/papers/VOS_20101115.pdf.

42 Andrew J. Rohm and Vanitha Swaminathan, "A typology of online shoppers based on shopping motivations," *Journal of Business Research*, July 2004, Volume 57, Number 7, pp. 748–757. See also Pradeep Chintagunta, Junhong Chu, and Javier Cebollada, *Quantifying transaction costs in online/offline grocery channel choice*, Chicago Booth School of Business research paper 09-08, 2009.

43 Sean Sands, Carla Ferraro, and Sandra Luxton, "Does the online channel pay? A comparison of online versus offline information search on physical store spend," *The International Review of Retail, Distribution and Consumer Research*, 2010, Volume 20, Number 4, pp. 397–410.

Time saved

Search can make it quicker to find information, which in turn can make it quicker to make decisions and shop. As a result, it boosts productivity. The following are examples that suggest just how much time search can save:

- A typical Internet search for academic information takes seven minutes. Relying on physical references takes 22 minutes.[44]
- A consumer generally finds time to perform ten searches online but only two searches offline for each purchase.[45]
- It takes the same amount of time to do three searches in an online business directory as it does to do one in a physical directory.[46]

Analysis for this report suggests that knowledge workers in business each save 30 to 45 hours per year as a result of search.

Raised awareness

Search helps raise the profile of any brand, product, or service, and paid search is recognized as one of the most effective forms of advertising. Large amounts of advertising spend are therefore being reallocated from other media into paid search.

The benefit of paid search to advertisers tends to be inversely proportional to the size of the advertiser, as it gives the smallest of entities the ability to raise awareness of their offerings to a worldwide audience—an otherwise difficult proposition. But paid search advertising is not the only way in which search can raise awareness. Organizations and individuals benefit from natural searches—that is, when their names pop up in search results simply because of what was typed in the search field. The majority of advertisers still find that more visits to their Web sites arrive via natural searches than paid ones.[47]

Here are some additional facts and examples that illustrate the value search can create by raising awareness:

- Search is one of the most powerful influencers when a consumer is considering which brand or product to purchase. For personal computers, search is the most commonly used source of information (34 percent of times) during the active evaluation phase of the consumer purchasing decision process.[48]
- Search accounts for 25 percent of the traffic of mainstream content creators.[49]
- An analysis of some 400 small and medium-sized businesses in France showed that those that invested in paid search advertising reported around twice as many cross-border sales as a percentage of total revenue as those that did not. Over a three-year period, these businesses also reported annual growth rates that were approximately one-and-a-half times as high as those that did not invest in search advertising.[50]

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44 Yan Chen, Grace YoungJoo Jeon, and Yong-Mi Kim, *A day without a search engine: An experimental study of online and offline search*, working paper, School of Information, University of Michigan, 2010, http://yanchen.people.si.umich.edu/papers/VOS_20101115.pdf.

45 McKinsey analysis of comScore data, eBay annual report.

46 Yan Chen, Grace YoungJoo Jeon, and Yong-Mi Kim, *A day without a search engine: An experimental study of online and offline search*, working paper, School of Information, University of Michigan, 2010, http://yanchen.people.si.umich.edu/papers/VOS_20101115.pdf.

47 McKinsey US clickstream data, 2009.

48 McKinsey Customer Decision Journey Survey for Consumer Electronics, February 2009.

49 McKinsey US clickstream data, 2009.

50 McKinsey proprietary survey of French small and medium-sized businesses, 2010.

- Some 70 percent of clicks following a search in the United States take users to a landing page that is less than a year old.[51] The percentage is similarly high elsewhere (India, 75 percent; France, 55 percent; Germany, 49 percent; Brazil, 40 percent).

Price transparency

This source of value is similar to better matching in that it helps users find the information they need, but here the focus is on finding products at lower prices. This report looks primarily at pricing comparison Web sites to evaluate this source of value.

More than 40 percent of Internet users in the United States, Germany, and France visited a price comparison Web site in 2010, and in the United States, their numbers are growing at around 20 percent a year.[52] Such a degree of search-enabled price transparency inevitably reduces prices in some product categories. One study showed that a 1 percent increase in traffic to a leading price comparison Web site decreased price dispersion—that is, the difference between the average and minimum price for a particular good—by 1.1 percent.[53]

This source of value benefits consumers in the form of economic surplus, often at the expense of retailers and other vendors. However, price transparency may also reduce consumer uncertainty about making a purchase, reassuring consumers they are getting the best price. It could thus potentially increase total volumes sold.

Long-tail offerings

Long-tail offerings are sales of niche items that relatively few customers might want. However, the aggregate demand in the long tail—that is, across a great many niches—can account for significant sales volumes. This is certainly the case for the top online stores, which hold 6 to 23 times the number of items in their online inventories that a physical store has in order to cater to long-tail demand.[54] These inventories are so extensive that use of a search is often the only way for customers to find the items they want.

Search is commonly used for finding or selling older, long-tail media content. It enables consumers to find the book, magazine, article, film, or recording they want, and it enables content providers to monetize old content, the costs of which are already sunk.

The following examples illustrate the value search creates through long-tail offerings:

- Web sites with broad long-tail inventories, such as Amazon and eBay, get 20 percent of their traffic from natural search. In addition, niche sites whose inventories are all in the long tail get more than 25 percent of their traffic this way.[55]

- An online research firm showed that search engines were used regularly by 32 percent of US online video viewers, many of whom seek long-tail content. Word of mouth was the only "search method" used more regularly to find content.[56]

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51 Google data as of January 1, 2011.

52 ComScore data.

53 Zhulei Tang, Michael D. Smith, and Alan Montgomery, "The impact of shopbot use on prices and price dispersion: Evidence from online book retailing," *International Journal of Industrial Organization*, November 2010, Volume 28, Number 6, pp. 579–590. For additional examples, see Erik Brynjolfsson and Michael D. Smith, "Frictionless commerce? Acomparison of Internet and conventional retailers," *Management Science*, April 2000.

54 Fenner, Trevor, Mark Levene, and George Loizou, *Predicting the long tail of book sales: Unearthing the power-law exponent*, Department of Computer Science and Information Systems, University of London, 2006, http://www.dcs.bbk.ac.uk/~mark/download/long_tail.pdf;
Erik Brynjolfsson, Yu (Jeffrey) Hu, and Michael D. Smith, *The longer tail: The changing shape of Amazon's sales distribution curve*, September 20, 2010, http://ssrn.com/abstract=1679991.

55 McKinsey US clickstream data, 2009.

56 Knowledge Networks press release, "Verbal word of mouth is pivotal source for learning about, deciding to watch video—on TV or online; trumps social media as influence," November 19, 2009.

- Even when it comes to mainstream content categories such as news, people rely increasingly on search. A 2010 survey of 3,000 US adults showed that more than 40 percent of 18- to 64-year-olds used search engines to find news online more than three times a week—20 percent more than in 2008. Often, the search leads to long-tail news content.[57]

- There are also important "second order" effects. For example, search makes it profitable for Amazon to stock obscure books and for authors to write them in the first place.[58]

People matching

This source of value again entails the matching of information, but this time to help online users discover each other, be it for social or employment purposes. Examples include:

- BeThe1, an online recruitment agency specializing in the luxury and fashion businesses and operating in 30 countries. The success of this French company, which has enjoyed double-digit growth since its launch in 2001, depends upon a proprietary search engine that helps it match candidates against very specific criteria.

- Shaadi.com, an Indian matchmaking site with some 11 million subscribers and estimated annual revenue of $35 million.

Exhibits 6 and 7 describe both these businesses in more detail.

Problem solving

Search tools can facilitate all sorts of problem solving, be it mundane matters such as how to put together a chair or decidedly more important ones such as whether the plant your one-year-old has just swallowed is poisonous. In business, search is commonly the starting point for solving a problem by bringing together the right teams and content.

It is hard to measure the value of problem solving. Search reduces the time and cost of looking for information while solving a problem. But because search makes so much more information accessible quickly and efficiently, it also delivers a step-change increase in capability.

A multinational company wanting, say, to assess the feasibility of producing a complex new product can use search to quickly gather together the right experts and the right data—a process that previously might have taken many weeks and still might not have identified the optimal people and information. Today, it is possible to assess an entire portfolio of products—and arguably make a better assessment—in the time it might have taken to assess just one product without search.

Despite the difficulty of measuring the impact of search, we believe the value of problem solving could outstrip that of many other sources of search value and is worthy of more, dedicated research. Adam Smith noted that specialization (and thus productivity) is limited by the extent of the market, and search increases that extent. Here are some examples that illustrate its worth:

- More than 95 percent of pharmaceutical industry companies use internal search engines to facilitate problem solving across geographies.

- Ninety-five percent of US journalists use search engines to research a story.[59]

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57 Pew Research Center for the People and the Press, *Ideological news sources: Who watches and why*, conducted by Princeton Survey Research Associates International, September 12, 2010.

58 Erik Brynjolfsson, Yu (Jeffrey) Hu, and Michael D. Smith, "From niches to riches: Anatomy of the long tail," *Sloan Management Review*, Summer 2006, Volume 47, Number 4, pp. 67–71.

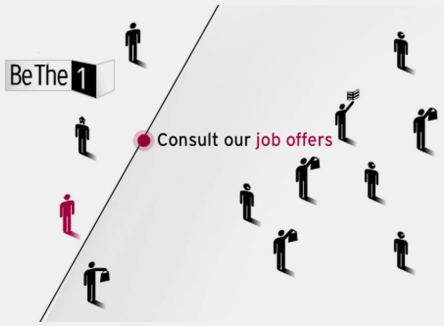
59 *2010 PRWeek/PR Newswire media survey*, PRWeek and PR Newswire, April 2010; 1,300 US media professionals and 1,385 US PR practitioners were surveyed online January 4–19, 2010, by C. A. Walker.

Exhibit 6

BeThe1 uses search to effectively recruit personnel in the fashion industry

CASE EXAMPLE

BeThe1 (France) is an online recruitment site whose success stems from a proprietary Web search that scouts for suitable profiles, saving time and offering better matching in the recruitment process.



Company offering
- Founded in 2001; a recruiting agency specializing in the luxury and fashion businesses
- Recruits for positions across all functions (e.g., HR, sales, marketing, retail) in 30 countries across the United States, Europe, Middle East, and Asia

Reach
- Has one of the largest databases with more than 120,000 people registered in over 140 countries
- Developed an algorithm using search engines to preselect candidate profiles matching several criteria

Results
- Has had double-digit growth since it was created and is No. 1 in France in its field with more than 30 recruitments per month
- ~5 times as productive as competitors, employs 14 employees, and has a 90% rate of success against industry average of 10–15%
- Search allows BeThe1 to reach 75% of relevant candidates for very specific jobs vs. 10% for its competitors

SOURCE: Interview with BeThe1 CEO François Bouyer; McKinsey analysis

Exhibit 7

Shaadi.com uses search to provide matrimonial matches

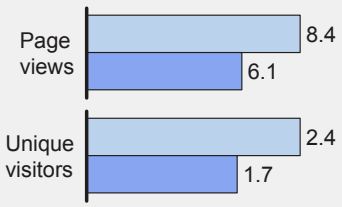
CASE EXAMPLE

Shaadi.com relies on search to provide value to customers by increasing the pool of marital candidates they can choose from.



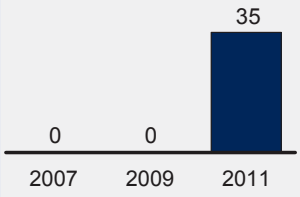
Company offering
- Founded in 1996; a popular Indian matrimonial site
- Objective: "to provide a superior matchmaking experience by expanding the opportunities available to meet potential life partners"
- Uses search to help match millions of users to each other for matrimonial purposes

Reach
Million



Over 11 million subscribers, mobile and nonmobile

Financials
Estimated revenue
USD Millions



60% ad-based, 40% subscription-based

SOURCE: Company Web site; EmPower Research; press search; McKinsey analysis

New business models

Without search, many recently developed companies and business models would not exist. Price comparison sites are a case in point. Examples of new companies and business models that are thriving on the back of search technology include:

- Kayak.com, a US online travel site that aggregates results from hundreds of travel sites to help users find the cheapest flights available. In December 2010, it had 4.3 million unique US visitors and 47 million page views.

- Justdial, referenced earlier in this report, is a search service in India for those without Internet access or who perhaps cannot read. Callers, regardless of their language, can ask an operator to search on their behalf. The business model is a variation of paid search. When a caller accesses a sponsored search result, the advertiser pays Justdial a fee, much like the cost-per-click model in advertising. Its 2009–10 revenue was 1.34 billion rupees ($29 million)—an average of 7 rupees ($0.15) per customer.

Exhibits 8 and 9 describe these businesses in more detail.

Entertainment

Given the quantity of digital music and video available, entertainment is a rich driver of search value. For a generation of teenagers who prefer to watch videos on YouTube rather than television, search has enabled a new form of entertainment. Its entertainment value will only increase as the Internet becomes the primary digital infrastructure for video programming of all kinds, effectively turning our televisions into network devices.

The essential role search plays in entertainment is illustrated by the following statistics:

- 30 percent[60] of total queries on Web search engines are for such topics as entertainment, adult content, games, or sports.

- 21 percent of YouTube streaming video traffic arrives via search.[61]

- There were 40 billion searches in 2009 on YouTube's site in the United States, representing around 20 percent of all US searches for YouTube content.[62] The other 80 percent came from other search engines.

- 20 percent of MTV's streaming media (e.g., video) traffic arrives via search.[63]

- 7 percent of Vevo's streaming music traffic comes via search. Vevo is the leading subscription music service in the world.[64]

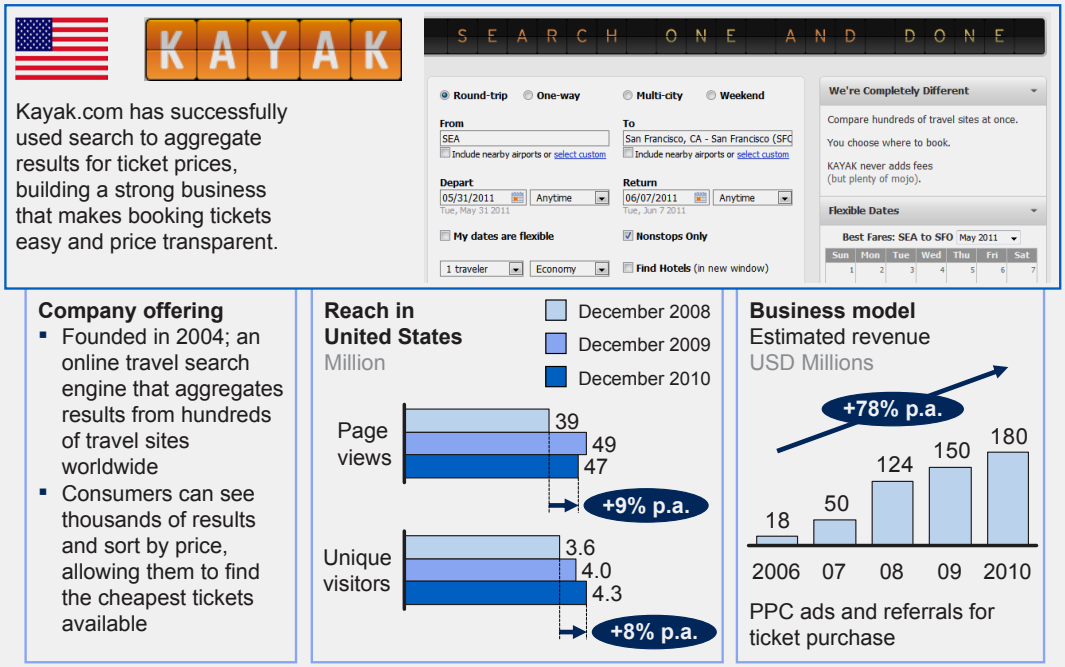
We do not claim that this list of the sources of search value is exhaustive, but it does capture a wide variety of ways in which search can affect various constituencies. As search evolves and the superset of searchable content continues to expand, we anticipate that new and unexpected sources of value will emerge. In the next section, we examine in more detail how these nine sources of search value affect different constituencies.

60 ComScore data.
61 ComScore data.
62 McKinsey analysis based on ComScore data.
63 ComScore data.
64 ComScore data.

Exhibit 8

Kayak.com uses search to help consumers match tickets at the lowest fare levels

CASE EXAMPLE



Kayak.com has successfully used search to aggregate results for ticket prices, building a strong business that makes booking tickets easy and price transparent.

Company offering

- Founded in 2004; an online travel search engine that aggregates results from hundreds of travel sites worldwide
- Consumers can see thousands of results and sort by price, allowing them to find the cheapest tickets available

Reach in United States
Million

Business model
Estimated revenue
USD Millions

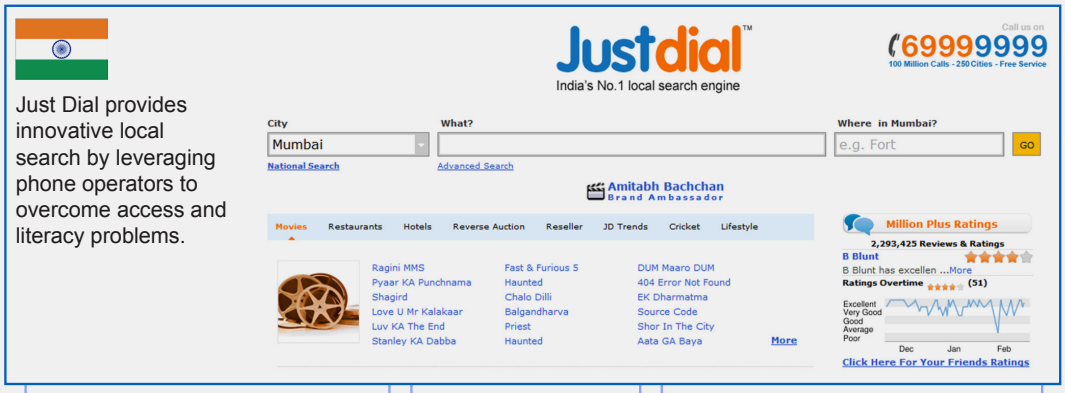
PPC ads and referrals for ticket purchase

SOURCE: Compete; kayak.com; Internet research; NeXt Up!; press search; McKinsey analysis

Exhibit 9

JustDial provides voice-enabled local search in India

CASE EXAMPLE



Just Dial provides innovative local search by leveraging phone operators to overcome access and literacy problems.

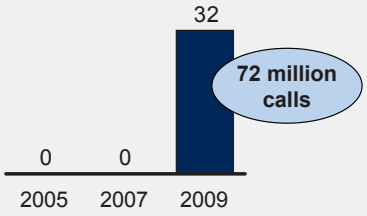
Company offering

- Indian local search destination started in 1996
- Customers dial a phone number and a live representative provides search results
- Search also available through SMS and Web

Reach

- Over 25 million unique users
- Over 200 million searches in a year
- Covers more than 200 cities in India

Financials
Search referrals and ad-based model



SOURCE: justdial.com; press search; McKinsey analysis

The value of search: Who benefits and how?

Search affects the activities of millions of people and organizations, so we cast our research net wide when trying to assess its value. We looked at its impact on businesses, individuals, and public service entities, homing in on 11 constituencies within these main groups—for example, advertisers and retailers in business, and health care and education in public services. We then examined the relevance of the nine sources of value to each in monetary and nonmonetary terms.

The results should be regarded as case studies illustrating the value of search rather than as a fully exhaustive analysis. If the task of quantification was too uncertain for some sources of value—such as calculating the value of better matching for retailers—or if the value was likely to be minor, it was not included in our analysis.

An analysis of value by constituency

The study showed that value accrues to all constituencies. The three most-studied sources of value from search—time saved, raised awareness, and price transparency—are important. Our study illustrated the additional impact of the other six sources of value we identified and revealed the extent to which the value of search goes underestimated. Exhibit 10 shows the sources of value for each constituency.

Exhibit 10

Primary sources of value from search

Constituencies	Better matching	Time saved	Raised awareness	Price transparency	Long-tail offerings	People matching	Problem solving	New business models	Entertainment
	Sources of value								
Advertisers	■		■						
Retailers	■		■	■	■			■	
Entrepreneurs	■	■	■	■	■		■	■	
Content creators	■		■		■			■	
Enterprise	■	■				■	■		
Consumers	■	■		■	■	■			
Individual content creators					■	■			■
Individual information seekers	■	■				■	■		■
Health care	■		■	■					
Education	■	■				■	■		
Government	■	■	■						

SOURCE: McKinsey analysis

The following section describes in more detail how value accrues to each of the constituencies. Where possible, we quantify a particular source of value. When that is not possible, we illustrate its impact qualitatively.

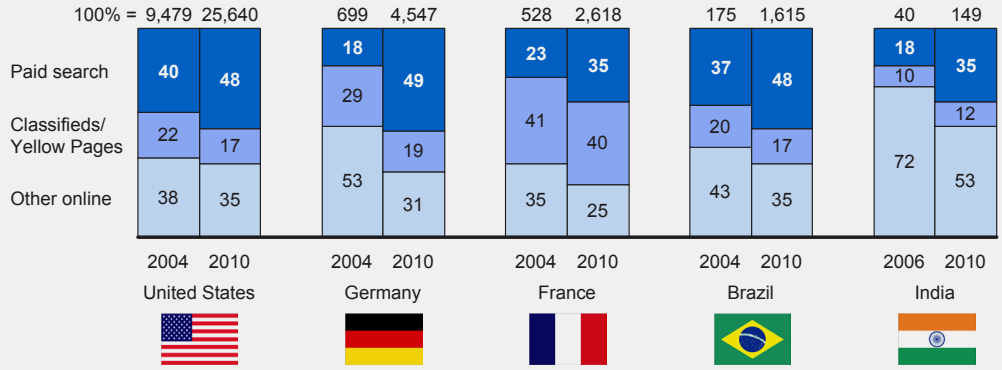
Advertisers

Having grown rapidly in the past five years, online advertising now accounts for a significant portion of total advertising spend, namely 18 percent in the United States, 20 percent in Germany, 16 percent in France, 16 percent in Brazil, and 3 percent in India[65] (Exhibit 11). Of that online spend, advertisers allocated around 40 percent to search advertising, thus spending about 6 percent of their total advertising outlay on online search advertising globally.[66]

Exhibit 11

Online advertising spend across countries by type, 2004–10

%; USD millions



	United States	Germany	France	Brazil	India
Online spend as a percentage of total ad spend, 2010	18%	20%	16%	16%	3%
CAGR, 2004–10 (%)					
▪ Online spend, all types	18%	37%	31%	45%	39%[1]
▪ Paid search spend	22%	62%[2]	40%	51%[3]	63%[3]

1 2004 data for search in India were not available, so 2006 was used.
2 Germany 2004 paid search data not available, so Magna Global number was used; classifieds were calculated by using Source Digest nondisplay, MAGNAGLOBAL paid search.
3 US ratio of classifieds ÷ (paid search + classifieds) was used to split paid search from MAGNAGLOBAL into paid search and classifieds for India and Brazil.

SOURCE: Source Digest; MAGNAGLOBAL; McKinsey analysis

What are the sources of value that motivate advertisers to spend so much on search? First, search and search advertising raise awareness. Search is an influential channel when consumers are deciding whether to make a purchase and what to buy. For example, McKinsey research shows that search engines dominate the touch points in the awareness and consideration phases of the purchasing process, particularly for automobiles, consumer electronics, and travel.[67] Other research, this time in the personal computer industry, shows that when customers are evaluating products, Web searches are the most influential touch point, even higher than in-store touch points such as meeting with a sales representative.[68]

Second, search has proven to be an extremely effective means of matching relevant information with user needs, helping advertisers target the right audience. Someone who searches for "auto insurance," for example, is likely to be interested in purchasing insurance, and an appropriate advertisement in the search results is likely to attract interest.

Third, search helps consumers find long-tail, niche products that they would otherwise be unlikely to discover.

65 MAGNAGLOBAL, Global Forecast Model, 2010.
66 MAGNAGLOBAL, Global Forecast Model, 2010.
67 McKinsey Digital Marketing Survey, 2007.
68 McKinsey Customer Decision Journey Survey for Consumer Electronics, February 2009.

All of these sources of value are particularly important to smaller companies, which, at relatively low cost, can reach a big audience. This is reflected in the fact that many more companies use search advertising than they do offline advertising formats. In the United States, paid search is used by about ten times as many advertisers as any other media channel (online display is second).[69]

We quantified the value of search to advertisers[70] from the three sources already described by estimating the ROI they earn from paid search advertising (both online and mobile), SEO, and online classified advertising. By looking at the effectiveness of search advertising, we estimated advertisers earn an average ROI of 7:1, given the typical mix of types of search-related advertising (see methodology for details). Based on these calculations, we estimated that the value advertisers derived from search in 2010 was $121 billion in the United States, $13 billion in Germany, $10 billion in France, $5 billion in Brazil, and $1 billion in India.

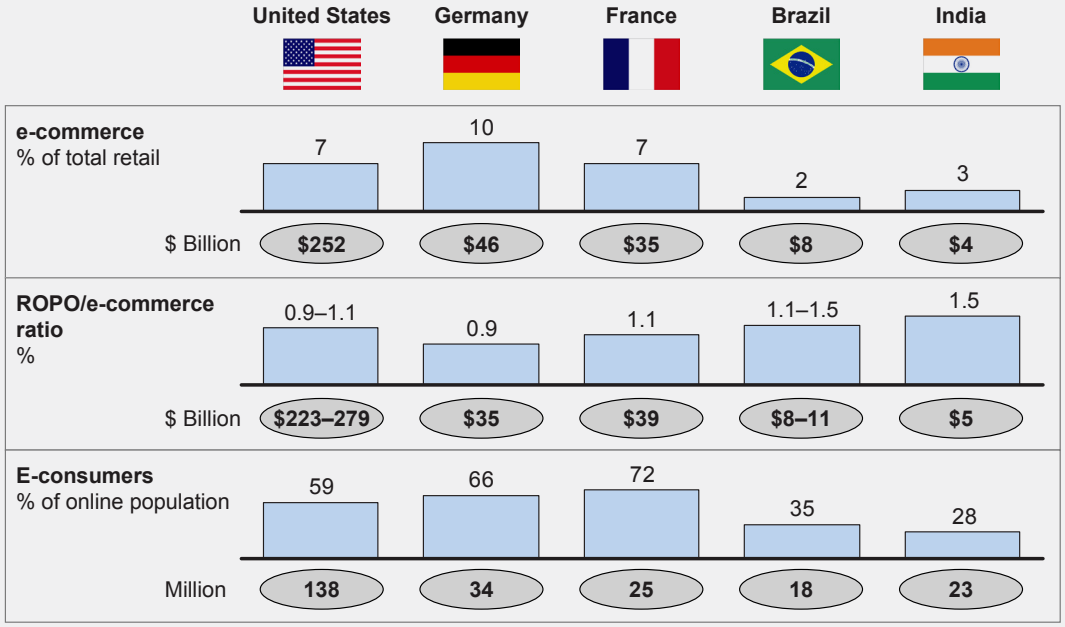
Retailers

Search benefits retailers through raised consumer awareness of their online and offline stores and products; better matching of products to customer needs; and the ability to better sell long-tail items. In the process, new retail business models have emerged, such as online retailers dedicated to sales of long-tail items, and smaller retailers have discovered a more level playing field: as the size of the retailer decreases, the relative benefit gained from search increases. For retailers that compete on the basis of price, price transparency is also a source of value. For others, however, it can result in surplus accruing to consumers.

E-commerce has experienced double-digit growth over the past three years, and search has played a critical role in that growth. E-commerce was worth $252 billion in the United States in 2009, representing 7 percent of total retail spending there. In Germany, e-commerce totaled $46 billion (10 percent of retail spending); France, $35 billion (7 percent); Brazil, $8 billion (2 percent); and India, $4 billion (3 percent). In the five countries studied, anywhere between 30 and 70 percent of the population shopped online (Exhibit 12).

Exhibit 12

E-commerce, ROPO[1] ratio, and e-consumers across countries, 2009



1 ROPO = Research Online–Purchase Offline.

SOURCE: Forrester; Fevad; BVH; PhoCusWright; Euromonitor; ComScore; survey performed by TNS Sofres/Consumer barometer in France, Germany, and India; ACTA consumer survey; e-Marketer; e-bit WebShoppers; McKinsey Global Institute

69 TNS; Media Dynamics, 2008.

70 When calculating the value, we defined advertisers as organizations that use paid search advertising as well as those that benefit from natural search.

Search plays a bigger role in enabling retail sales than the e-commerce figures alone suggest. That is because search enables what is known as Research Online-Purchase Offline (ROPO): consumers collect information on the Web that informs their purchasing decision, and then they go to a physical store to buy what they have chosen. The estimated ratio of ROPO purchases to online purchases in the countries studied ranged between 0.9 and 1.5. In other words, the value of goods researched online and purchased offline is similar to that of goods researched and purchased online.

We estimated the value of search to retailers[71] by looking at the volumes of sales that occur because search was used at some stage in the decision-making process. This volume was calculated by synthesizing the results of three separate analyses. (See methodology for details.)

Accordingly, the value of search for retailers was worth 2 percent of total retail volumes in the developed economies studied in 2009 and 1 percent in the developing ones where e-commerce is less prevalent. This represents 10 to 15 percent of the value of e-commerce and ROPO sales combined and translates into search value for retailers ranging from $1 billion in India to well over $50 billion in the United States (Exhibit 13).

Exhibit 13

Impact of search on e-commerce and ROPO, 2009

USD billions

	United States	Germany	France	Brazil	India
E-commerce	31–32	5.0–5.3	3.3–3.5	1.0	0.4
ROPO	26–35	3.9–4.0	3.8–3.9	1.1–1.4	0.7
Total	57–67	8.9–9.3	7.1–7.4	2.1–2.4	1.1
% of retail	1.8%	1.9%	1.4%	0.7%	0.7%

SOURCE: Hal Varian, "Online ad auctions," May 2009; McKinsey primary research, Digital Marketing Survey, 2007; comScore; Nielsen; McKinsey analysis

It should be noted that these figures represent net value. They do not include costs or the impact of price transparency on retail revenue.

71 We define retailers for the purpose of this calculation as businesses with a presence on the Web that sell products and/or services to consumers either online or offline.

Entrepreneurs

Entrepreneurs are heavy users of search tools and benefit from them in various ways throughout the start-up life cycle. It helps them problem solve when testing new business ideas; find suppliers, investors, and customers; and identify key talent—the latter an important challenge for small companies whose every employee can be crucial to success. A Canadian survey found that 96 percent of entrepreneurs used search for general research and that 77 percent used it for competitive intelligence.[72] A separate Israeli survey of entrepreneurs found that search engines were the most heavily used tools for information retrieval.[73]

Perhaps most important, search has fostered new, entrepreneurial business models. So-called micro-multinationals are born global as search gives them instant access to a worldwide audience of potential customers. Niche-market players also depend upon search to find the suppliers and customers they need. Shoes of Prey is an Australian shoe manufacturer whose customers are invited to design their own shoes. Without search, this company would have found it difficult to find a critical mass of such customers. But a paid search campaign that gave it access to an international market means that some 40 percent of its sales are now to overseas customers.

Some companies have been born on the back of a particular source of search value. India's Shaadi.com and France's BeThe1 recruitment site are the product of people matching. Others use long-tail business models. QueBarato, for example, is a Brazilian classifieds Web site operating in Latin America and the United States. It has more than 4.8 million listings a day generated by individuals and small business for jobs and events and for real estate, vehicles, and many other products.

Given the many ways in which search creates value for entrepreneurs, it is difficult to quantify and we have not attempted to do so. However, the previous examples illustrate the scope of the benefits.

Content creators

Content creators derive value from search in a variety of ways. Many profit from their retail activities, so some of the sources of value that apply to retailers apply to these businesses, too. With so much online content available, search enables better matching of consumer demand to content supply; it raises awareness of mainstream content creators and directs traffic to them; and it makes more obscure, long-tail content discoverable. As advertisers, content creators also benefit from the sources of value that other advertisers enjoy: raised awareness, better matching, access to the long tail, and new business models.

We quantified two sources of search value for content creators: revenue from search-related advertising (on horizontal Web search engines and internal searches within Web sites) and revenue from content sales[74]—that is, sales of books, music, and videos through e-commerce and as a result of ROPO. (See the methodology for more detail.)

Exhibits 14 and 15 show the value accrued by content creators from each of these revenue streams. In the United States, the value from advertising is well over $2.2 billion; in India, it's more than $20 million. The value from content sales is more than $300 million in the United States, representing up to 1 percent of US content sales. In India, the value from content sales is $25 million, representing 4 percent of Indian content sales.

72 Business Development Bank of Canada, *ViewPoints online panel: Ad hoc study among Canadian entrepreneurs*, September 2009.

73 Snunith Shoham, Shifra Baruchson-Arbib, and Osnat Gouri-Oren, "An exploratory study of Israeli start-up entrepreneur usage of the Internet," *Journal of Information Science*, Volume 32, Number 1, February 2006, p. 49.

74 We did not attempt to quantify the value of business-to-business content creators or media companies that sell on a subscription basis, although we acknowledge this is a source of significant value.

Exhibit 14

Search value to content creators, 2010

USD millions

	United States	Germany	France	Brazil	India
Total nonsearch online ad market (i.e., online display and rich media)[1]	8,978	1,428	657	568	79
Advertising revenue from horizontal Web search engines (~20–25% of total)	1,796–2,244	286–357	131–164	114–142	16–20
Advertising revenue from internal search within Web sites (~5–7% of total)	449-628	71–100	33–46	28–40	4–6
Total	**2,244–2,873**	**357–457**	**164–210**	**142–182**	**20–25**

1 US data are gross spend. All other countries are net spend. Net spend excludes amount given to ad agencies.

SOURCE: McKinsey analysis

Exhibit 15

Search value to content creators as retailers, 2009

USD millions

	United States	Germany	France	Brazil	India
E-commerce[1]	291–407	80–107	52–79	15–20	7–9
ROPO[2]	58–204	16–22	26–35	42–55	20–26
Total	**349–611**	**96–129**	**78–105**	**56–75**	**27–36**
% of total retail value	0.7–1.0%	1.1–1.4%	1.2–1.6%	2.7–3.0%	3.3–4.0%

1 Portion of e-commerce for the product subcategory of books and music and video by country. It is assumed that around 30 percent of that figure reverts to content creators, with the remainder captured by distributors.

2 ROPO coefficient for books and music and video by country. It is assumed that around 30 percent of that figure reverts to content creators, with the remainder captured by distributors

SOURCE: McKinsey analysis

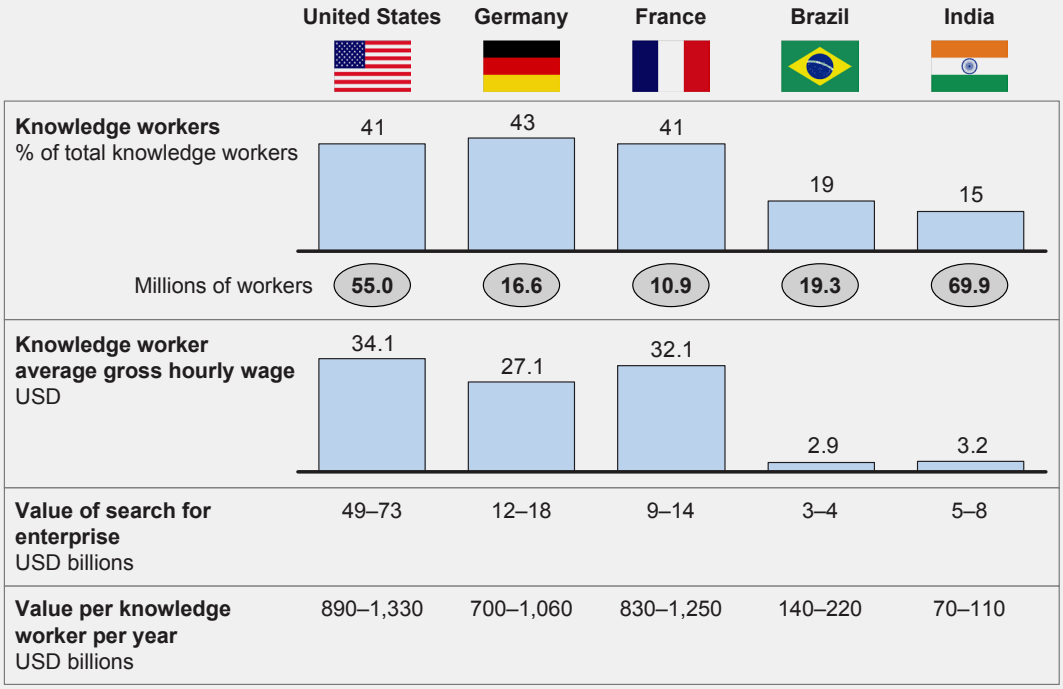
Enterprises

Enterprises benefit from search in a multitude of ways, including the ability to find the right information, supplier, or employee through better matching; employee time saved by searching online; and collaborative problem solving. As a gauge of some aspects of search value to enterprise, we calculated the value of the productivity gains made by knowledge workers that many of the sources of value deliver.

Several existing studies[75] have demonstrated significant productivity gains from search in different geographies. We assume a 10 to 15 percent gain in productivity for the time that enterprise knowledge workers spend searching for information. The value of this productivity gain was calculated on the assumption that knowledge workers spend on average five hours per week, or about 12 percent of their time, searching online. We then took into account local wages and the number of knowledge workers per country to arrive at an estimate of the value of search in 2009 in the five countries studied. Exhibit 16 shows how value ranges from $49 billion to $73 billion in the United States to $3 billion to $4 billion in Brazil.

Exhibit 16

Quantifying the impact of search on enterprises across countries, 2009



SOURCE: McKinsey analysis

The percentage of knowledge workers in different geographies currently varies from 15 percent in India to more than 40 percent in the United States, France, and Germany.[76] However, in all geographies, the number of knowledge workers in the economy is growing, as is the proportion of knowledge workers. The enterprise value of search as measured by productivity gains among these workers will therefore increase over time.

75 Yan Chen, Grace YoungJoo Jeon, and Yong-Mi Kim, *A day without a search engine: An experimental study of online and offline search*, working paper, School of Information, University of Michigan, 2010, http://yanchen.people.si.umich.edu/papers/VOS_20101115.pdf; *The hidden costs of information work*, IDC white paper, March 2005; McKinsey proprietary survey of French small and medium-sized businesses, 2010.

76 *The hidden costs of information work*, IDC white paper, March 2005, corroborated by McKinsey primary research.

Consumers

This constituency consists of individuals who use search for transactional purposes, regardless of whether the purchase is eventually made online or off.

Consumers primarily benefit from search through increased price transparency, better matching—including access to long-tail products and finding people—and time saved. When it comes to price transparency, academic research shows that the more visits made to price comparison Web sites, the lower prices fall and the greater the difference between the average and minimum price for a particular good.[77] Thus, price transparency has a disciplining effect on the margins retailers can expect, which benefits consumers. Preliminary research shows prices online are, on average, 10 percent lower than those offline as a result of the price transparency afforded by search tools.[78]

Better matching is particularly valuable to consumers when they want long-tail items. Research shows that consumers value a hard-to-find, long-tail product anywhere between 1.3 to 1.8 times the actual price of the product.[79] Consumers therefore capture significant amounts of surplus when they buy products in the long tail.

With regard to time saved, various studies taken together suggest that consumers who search online for their purchase can save 10 to 20 hours a year.[80] Using data from academic studies, we valued that time at between $0.5 and $7 per hour, based on average, after-tax income per household in each country and the assumption that a consumer's leisure time was worth 65 percent of this figure.[81,82]

In addition, there are other aspects of consumer value, such as better matching that is not in the long tail, or the convenience of online shopping. Taking all this into account, we calculated that the value created for consumers in 2009 ranged from $41.9 billion in the United States to $0.5 billion in India (Exhibit 17). The methodology explains these calculations in more detail.

The value to consumers is likely to rise as people increasingly use smartphones to research products while shopping in physical stores. Consumers are also likely to benefit from new, location-based search services that take into account not only the search terms but also the user's location, providing even better matching of product and service offers to customer needs.

Individual content creators

One of the most interesting aspects of the Internet revolution has been the emergence of hundreds of millions of individual online users who create and share content—blogs, reviews, photos, videos, and social networking information—without expecting to make any money from it. These are the people who fall into this constituency. "Social media" is the term commonly used to capture their online activity, but it can also be seen as a means of self-expression, and one that would be much less effective without search technology.

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77 Zhulei Tang, Michael D. Smith, and Alan Montgomery, "The impact of shopbot use on prices and price dispersion: Evidence from online book retailing," *International Journal of Industrial Organization*, Volume 28, Number 6, November 2010, pp. 579–590.

78 Primary McKinsey research in France, India, and the United States.

79 Erik Brynjolfsson, Michael D. Smith, and Yu (Jeffrey) Hu, "Consumer surplus in the digital economy: Estimating the value of increased product variety at online booksellers," *Management Science*, 2003, Volume 49, Number 1, pp. 1580–1596.

80 Low end is based on IDC estimate of efficiency gains for enterprise searches in *The hidden costs of information work*, IDC white paper, March 2005. High end is based on efficiency gains for general online searches in Yan Chen, Grace YoungJoo Jeon, and Yong-Mi Kim, *A day without a search engine: An experimental study of online and offline search*, working paper, School of Information, University of Michigan, 2010, http://yanchen.people.si.umich.edu/papers/VOS_20101115.pdf.

81 Austan Goolsbee and Peter J. Klenow, *Valuing consumer products by the time spent using them: An application to the Internet*, paper prepared for the American Economic Association session on "The roots of innovation," Boston, MA, January 8, 2006.

82 Sergio Jara-Díaz, Marcela Munizaga, Paulina Greeven, Reinaldo Guerra, and Kay Axhausen, "Estimating the value of leisure from a time allocation model," *Transportation Research Part B: Methodological*, December 2008, Volume 42, Number 10, pp. 946–957.

Huge numbers of people generate their own content. Depending on the geography, individual content creators represent anywhere from 30 to 60 percent of all Internet users, with the percentage higher in developing economies. Between 40 and 60 percent of Internet users regularly browse user-generated content[83] (Exhibit 18).

Exhibit 17

Impact of search on consumer surplus, 2009

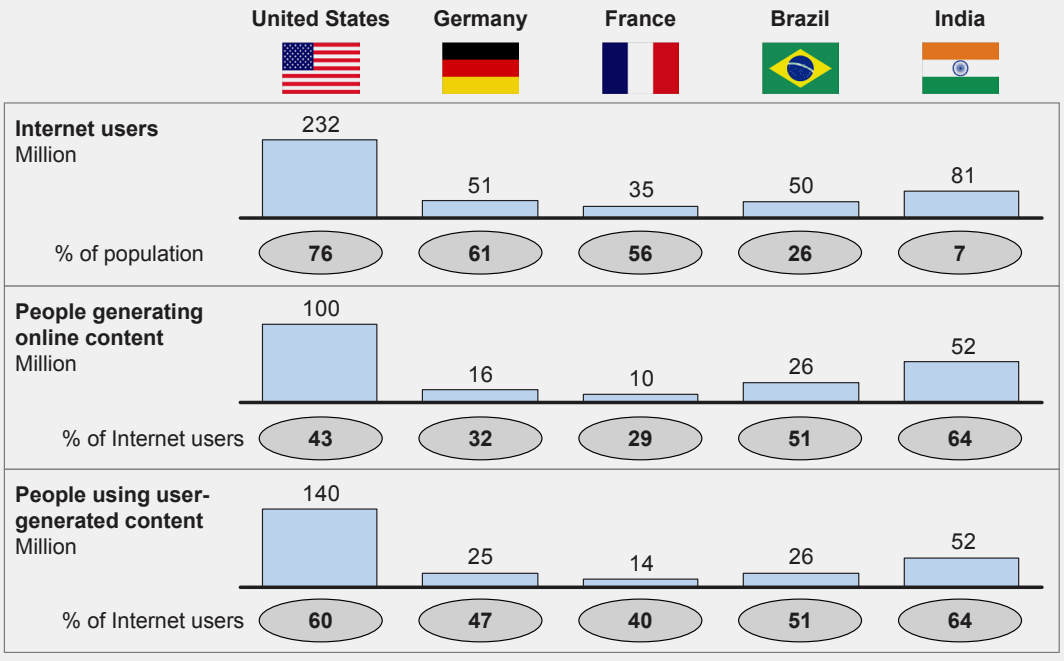
USD billions

	United States	Germany	France	Brazil	India
Consumer surplus	21.2	3.2	2.5	0.7	0.4
▪ Better prices	3.1	0.5	0.3	0.1	0.0
▪ Long-tail access	13.0	1.9	1.5	0.5	0.2
▪ Other	5.1	0.8	0.7	0.2	0.2
Time saved	20.7	4.8	4.1	0.4	0.1
Total	**41.9**	**8.0**	**6.6**	**1.1**	**0.5**
USD per Internet user	15	13	16	2	0
USD per e-consumer	25	20	22	5	2

NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey analysis

Exhibit 18

Summary of individual content creators across countries, 2009



SOURCE: McKinsey analysis

This explosion of user-generated content is concentrated in three types of Web sites:

- Aggregators of user-generated videos (YouTube), photographic images (Flickr), consumer reviews (Yelp), and other collaborative information resources such as Wikipedia.
- Social networks such as Facebook, LinkedIn, and Myspace.
- Individual blogs, diaries, and micro-blogging services such as Twitter.

Search makes all of this personal content accessible, delivering value through better matching, people matching, and long-tail offerings. Many social media sites have internal search capabilities for finding other people, a direct application of people matching, for example. And much user-generated content is long-tailed to the extreme.

It is hard to measure the value of search to individual content creators. However, the sheer numbers of those who create content to express themselves in one way or another—knowing that search will help make their voices heard—explain in part the power of social mediia to influence social dynamics around the globe.

Individual information seekers

This group includes individuals who use the Internet to find information of any kind, including entertainment, for their own purpose—which means just about everyone who uses the Internet. We distinguish individuals in this role from their role as consumers, as their objective is not to purchase or acquire merchandise but usually to answer a question or to learn or experience something.

Most value for this constituency lies in the efficient discovery of the "right" information, a form of matching, be it the right job or the right professional in the yellow pages. Much of this information can also be regarded as a long-tail offering, as individual information seekers are often after a niche product—perhaps a specific date to include in an essay, a digital map showing the easiest driving route to a friend's home, an old newspaper story from the archive, or yesterday's sports scores. Search can give individuals access to the most detailed, esoteric information on demand, and from just about anywhere.

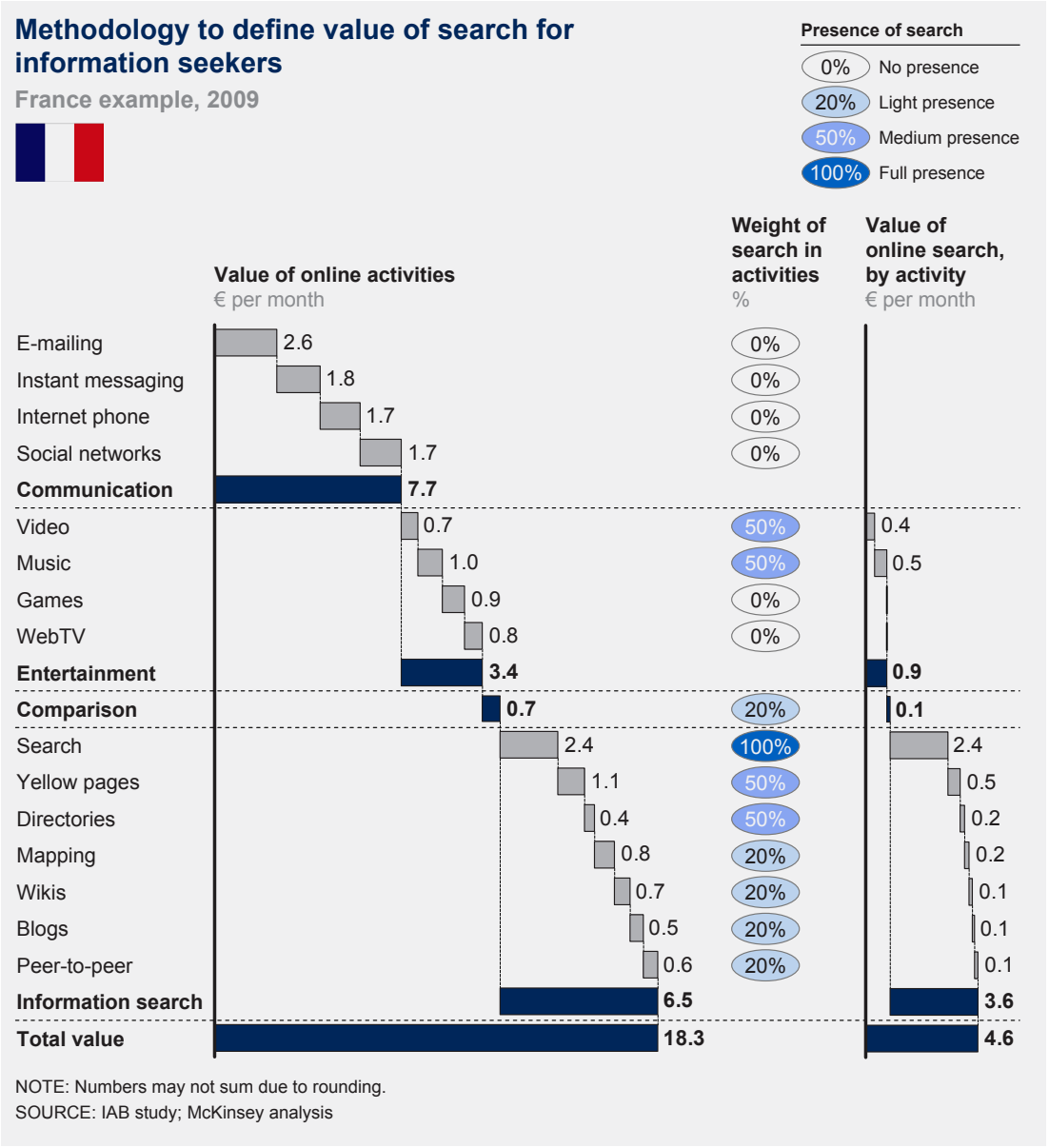
Mobile digital devices increase the opportunity to seek information. Mobile search patterns are only now beginning to emerge, but it is clear that users find search-on-the-go particularly useful. Recent research shows that 28 percent[84] of smartphone users use search to get maps and directions and that 48 percent[85] of searches on mobile phones are related to local activities. A good indicator of just how fast users are embracing mobile search is the fact that mobile usage of Google Maps, which is available on 13 percent of all mobile phones, grew by 58 percent last year.[86]

84 Opus Research.
85 McKinsey iConsumer survey in the United States, 2010.
86 ComScore, press searches.

To gauge the value of search to this constituency, we used conjoint analysis to ascertain what value Internet users placed on certain services such as Web search, access to directories, and social networks. We then estimated the extent to which search enabled these services by looking at the number of searches made relative to the number of pages viewed per service, and we adjusted the value accordingly. (See methodology for further detail.) Exhibit 19 shows how the value of search to information seekers in France—€4.6 ($6.50) per month—was calculated.

Exhibit 20 shows our estimates of the value created by search for individual information seekers in each of the countries studied. We estimate this to be between around $70 and $110[87] per year per Internet user in France, Germany, and the United States, and around $150 to $160[88] in Brazil and India. Of this, around 55 percent[89] of the value comes from horizontal Web search engines (e.g., text queries, Web mapping queries); 25 percent from internal Web site searches (directories, yellow pages, Wikis); and 20 percent from entertainment searches (games, music, video, WebTV, and peer to peer).

Exhibit 19



NOTE: Numbers may not sum due to rounding.
SOURCE: IAB study; McKinsey analysis

87 McKinsey & Company for IAB Europe, *Consumers driving the digital uptake: The economic value of online advertising-based services for consumers*, September 2010.

88 McKinsey & Company for IAB Europe, *Consumers driving the digital uptake: The economic value of online advertising-based services for consumers*, September 2010; Brazil and India estimates based on Russian data.

89 Based on a McKinsey analysis of weight of search for each Internet activity based on comScore data.

Exhibit 20

Value of search

USD per user per month

	United States	Germany	France	Brazil	India
Impact of search on . . .					
Value of horizontal Web search	4.9	3.2	3.3	8.8	8.8
Value of internal Web site search	2.1	1.4	1.8	2.5	2.5
Value of entertainment	2.3	1.2	1.2	2.4	1.2
Total per Internet user per month	9.3	5.8	6.3	13.7	12.5
Total per Internet user per year	112	70	76	164	150
Total per year for all users USD billions	22.9	3.5	2.6	8.2	12.1

SOURCE: McKinsey analysis

Health care

Health care represents a large share of GDP in the five countries studied in this report: 10 to 16 percent in the United States; 8 to 11 percent in France and Germany; and 5 to 8 percent in India and Brazil.[90] Health care expenditure is also growing faster than GDP growth in most countries, making the potential value for search particularly important for this constituency.

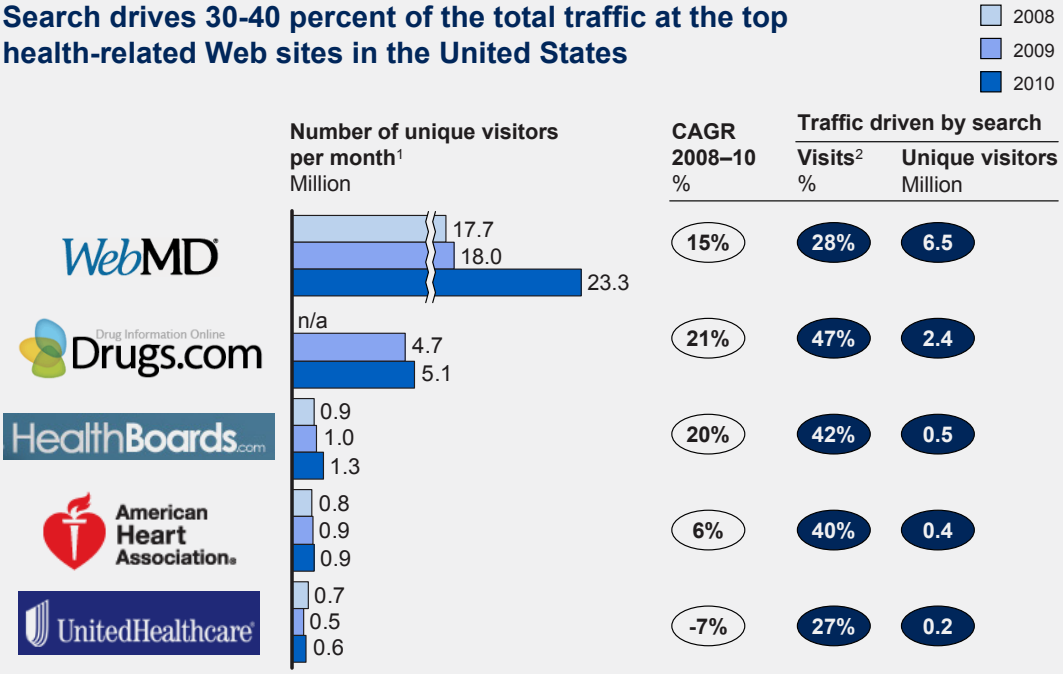
For patients, search delivers value by raising awareness about health-related topics or helping them find useful information. Search also enables people matching—perhaps finding the right doctor or support community. In the United States[91] and Brazil,[92] some 80 percent of the population searched online for a health-related topic in 2010, each performing an average of 60 to 65 health-related queries per year. And in the United States, search drove 30 to 40 percent of the total traffic at the top five health-related Web sites (Exhibit 21).

For health care providers, better matching and access to long-tail content can help reduce costs, by enabling patients to search for relevant, routine healthcare information on the Web rather than always requiring the involvement of a medical professional. But for health care providers, payers, and patients alike, the best source of search value might prove to be improved health outcomes. Though this has yet to be measured, there is already some evidence that search changes the behavior of health care providers. For example, 86 percent of US physicians search online for medical information, and one-third of their searches change the way they treat patients.[93]

90 Data taken from Global Health Observatory and World Health Organization National Health Accounts.
91 Pew Internet and American Life Project, 2010.
92 Survey of 603 Internet users conducted by Google and Media Screen in Brazil in July 2008.
93 Survey conducted of 411 physicians (primary care physicians/general practitioners, cardiologists, and psychiatrists) by Google and Hell & Partners.

Exhibit 21

Search drives 30-40 percent of the total traffic at the top health-related Web sites in the United States



1 August 2010.
2 Conservative estimate of unique visitors assuming that the number of visitors coming through search engines are more likely to be unique visitors than the visitors coming directly to the Web site.

SOURCE: ComScore; McKinsey analysis

Other examples of the potential value of search in health care include:

- Google's flu index analyzes queries for terms that would indicate a rise in symptoms associated with flu, a potentially powerful tool for epidemiologists and one that could help public health officials and health professionals better respond to epidemics.

- AOK, a Germany health insurer, uses an internal search engine to compare and monitor hospitals' key performance indicators.[94]

- Sunnybrook, a US health science center, uses an internal search engine to help its 10,000 physicians access more than 250,000 documents and provide more informed patient care.

Education

As with health care, the best measure of the value of search in education might be its impact on outcomes, but any attempt to measure this is beyond the scope of this research. Instead, we offer examples that demonstrate the ubiquity of search in education for students and teachers alike.

Almost 4 percent of all searches in the United States are for educational courses, curricula, and tutorials. That amounted to 6 billion searches in 2010, with average annual growth of 12 percent from 2008 to 2010.[95] In another survey, some 42 percent of Indians who used the Internet cited education and learning as one of the top three reasons to use the Internet.[96]

Search also helps those not enrolled at educational institutions. The nonprofit Khan Academy offers a free set of educational videos. In 2010, one million students a day visited the Khan Academy site and watched between 100,000 and 200,000 videos a day. Eleven percent of the Khan Academy's page views came from search.[97]

94 AOK Web site and German public data.
95 ComScore Search Benchmarker.
96 iConsumer India, 2010.
97 ComScore Marketer.

Search supports initiatives to help keep education affordable and accessible to all. For example, Project Gutenberg has more than 19,000 classics and textbooks online for free. About 23 percent of its traffic comes through search. Flatworldknowledge.com also offers free online textbooks and gets 16.7 percent of its traffic through search, well over two-thirds of which is from countries other than the United States.[98]

A survey of biology teachers in New York state found that 99 percent used search engines as a tool for instructional planning, 89 percent used specific Web sites, and only 20 percent used digital libraries.[99]

Government

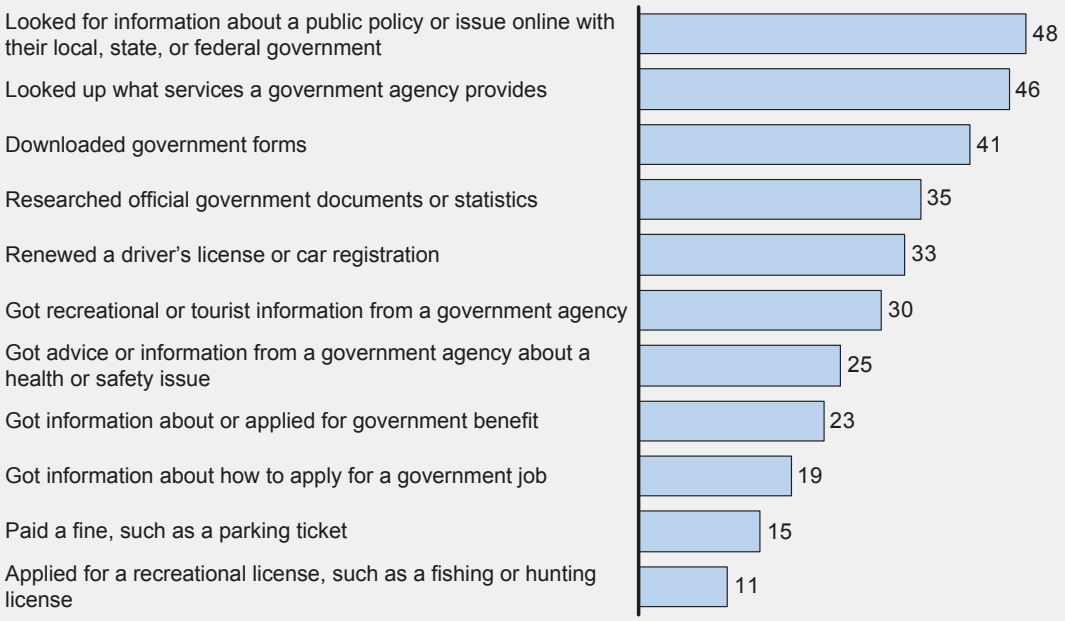
Governments around the world have come to depend upon search to provide their services. In 2010, 3.8 percent of all searches in the United States—5.2 billion in all—were government-related, and the number grew at a compound annual growth rate of 11 percent between 2008 and 2010.[100] In December 2009, 44 percent of visits to US government Web sites were facilitated by search engines.[101] In Germany, the share was even higher—between 49 and 75 percent.

People and organizations visit government sites for all manner of reasons, as Exhibit 22 illustrates, and search has become a key element of e-government, helping governments to engage with citizens, improve public service delivery, enhance transparency, and strengthen public participation and democratic processes.

Exhibit 22

Leading activities conducted on government Web sites according to US Internet users, December 2009

% of respondents



SOURCE: Pew Internet and American Life Project, "Government online," April 27, 2010

But of course, all this information and online service is valuable only because search makes it accessible. Search therefore creates value by raising awareness, better matching citizens' needs, making available long-tail content, problem solving, and saving time.

98 Alexa, last 30 days, from March 14, 2011.
99 Anne Marie Perrault, *An exploratory study of biology teachers' online information-seeking practices*, American Association of School Librarians, 2009.
100 ComScore.
101 Pew Internet and American Life Project, *Government online*, April 27, 2010.

For example:

- The United Kingdom recently launched a Web site that provides records of all government expenses over £25,000 ($41,000). More than 20 percent of site traffic results from a search.[102]
- In Germany, PortalU provides government data on the environment with access to 500,000 database entries from more than 340 public organizations.[103] More than 20 percent of its site traffic comes from search engines.[104]
- The online listing of 20 million records of land ownership in the state of Karnataka in southwest India makes it possible for the 6.7 million farmers there to obtain copies of their land records at virtually no cost. Previously, farmers often had to pay bribes as well as absorb the cost of travel to get their documents.[105]
- Search helps governments raise awareness of key messages. In France, an anti-drug TV campaign told viewers to either call a phone number or go to the Web site www.drogues-info-service.fr. Over the period of the campaign, almost 55 percent of visits to the Web site[106] came via search.

Search creates value for government and its citizens in both monetary and nonmonetary terms. This report restricts itself to illustrating the potential monetary value by estimating the productivity gains of knowledge workers employed by governments as a result of time saved. The methodology is analogous to that used to estimate the productivity improvement of knowledge workers in enterprises, explained in the methodology.

Exhibit 23 shows that the value of the productivity gains in 2009 ranged from $0.3 billion to $0.5 billion in Brazil, to $3.7 billion to $5.6 billion in the United States.

Exhibit 23

Value of search to governments, 2009

	United States	Germany	France	Brazil	India
% of active population with a government job[1]	7.6%	6.9%	9.1%	10.6%	37.1%
% of knowledge workers in the labor force	41%	43%	41%	19%	15%
Value USD billions	$3.72–5.55	$0.83–1.24	$0.82–1.28	$0.32–0.53	$2.23–3.34

1 US government only—excludes teachers, doctors, administrative; Germany—includes teachers, doctors, administrative; France—includes teachers, doctors, administrative; India—includes whole public sector; Brazil—includes public sector except research, health, education.

SOURCE: US Bureau of Labor Statistics; Federal Statistical Office of Germany; INSEE; Economic Survey 2009–10 of India; Ipea; Rais; International Labor Organization; McKinsey Global Institute

102 Alexa, last 30 days, from March 14, 2011.
103 PortalU.de.
104 Alexa, last 30 days, from March 14, 2011.
105 United Nations Public Administration Network, *Global Corruption Report*, 2003, http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan008435.pdf.
106 Alexa, last 30 days, from March 14, 2011.

Comparative returns on investment

Previous research referred to earlier in this report has looked at the value that search offers advertisers in terms of their return on investment.

As previously detailed, advertisers do well, earning an average ROI of 7:1 from search-related advertising. Others constituencies fare better still.

Based on the value of time saved alone, individuals in our study—that is, individual information seekers and content creators, consumers, and entrepreneurs—earn an ROI of 10:1, on average.

Enterprises earn still more, with an ROI of 17:1 as a result of time saved.

The methodology explains these calculations in detail.

The economic value of search

Exactly how much value does search create? To date, no one has looked at its economic contribution at a country level, let alone a global level.

As described earlier, our research looked at nine sources of value for 11 constituencies in five countries. In some cases we were able to quantify the resulting value, and in others we were able to illustrate it only qualitatively. The methodology describes how we used this analysis to arrive at a global estimation of search value.

The analysis showed that search activity had measurable impact approaching gross annual value of $780 billion in 2009. This is a necessarily conservative figure, given that the research was limited in terms of the number of constituencies and sources of value analyzed. It is a significant figure nevertheless, making each search worth $0.50 and equivalent overall to the GDP of the Netherlands or Turkey in 2010.[107] Moreover, the speed at which the search environment evolves guarantees that this figure has already been surpassed.

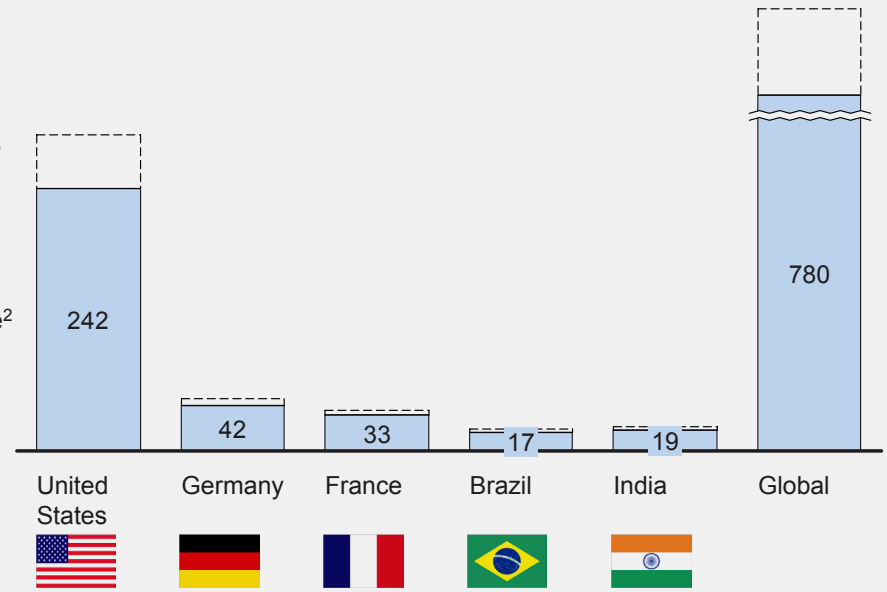
Exhibit 24 shows how the value was divided among the five countries we studied.

Exhibit 24

Gross value created by search across countries, 2009

ESTIMATES

USD billions



1 These are only estimates and should not be taken out of context of the accompanying text.
2 These values are conservative. They include only quantified estimates and do not include value that we did not quantify, such as the improvement in the quality of a consumer's shopping experience from better matching.

SOURCE: McKinsey analysis

107 International Monetary Fund.

Not all this value shows up in GDP. While corporate benefits in the form of higher productivity are captured, many consumer benefits, such as lower prices and time saved, are not. Some of these are likely to have an indirect impact on GDP. In addition, some sources of value in education and health care that we did not quantify also boost GDP directly. The estimate of search's impact on GDP should therefore be considered as conservative. It is nevertheless significant. The research showed gross value of $540 billion, or 69 percent of the measurable value, flowed through to GDP. This is roughly the size of the global print and publishing industry[108] or Switzerland's GDP.[109] The methodology describes in detail how search's contribution to GDP was estimated.

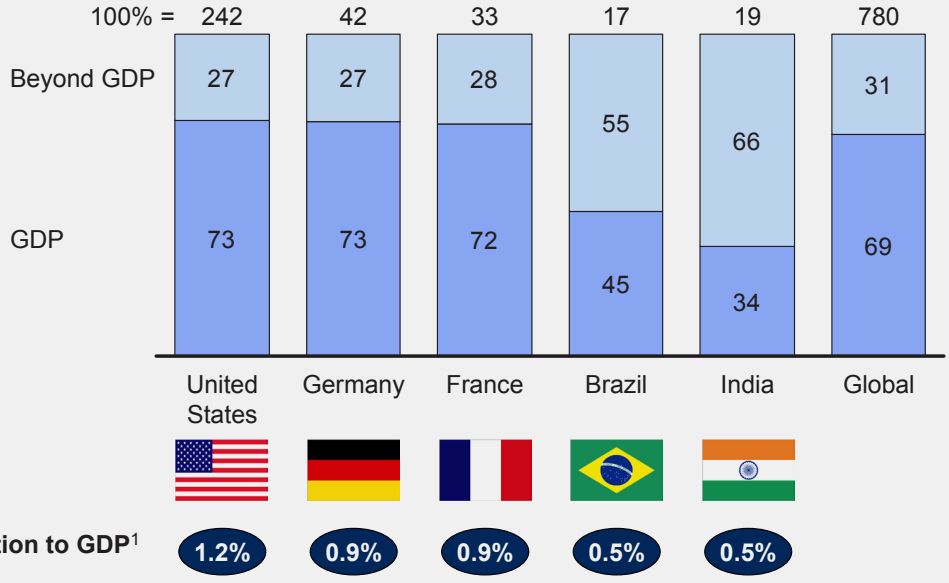
Exhibit 25 shows how search's contribution to GDP was spread across the five countries studied. Of the value created, around 70 percent contributed directly to GDP in the developed countries studied and 40 percent in the developing countries. This represents between 1.2 and 0.5 percent of each country's GDP.

Exhibit 25

Value created by search across countries, 2009

ESTIMATES

Measured value
%; USD billions



1 Represents only the portion of value that is attributable to GDP (e.g., the 73% of $242 billion in the United States).
SOURCE: McKinsey analysis

108 Includes publishing of books, brochures, musical books, newspapers, journals and periodicals, recorded media, and other publishing. Also includes printing, service activities related to printing, and reproduction of recorded media.

109 International Monetary Fund.

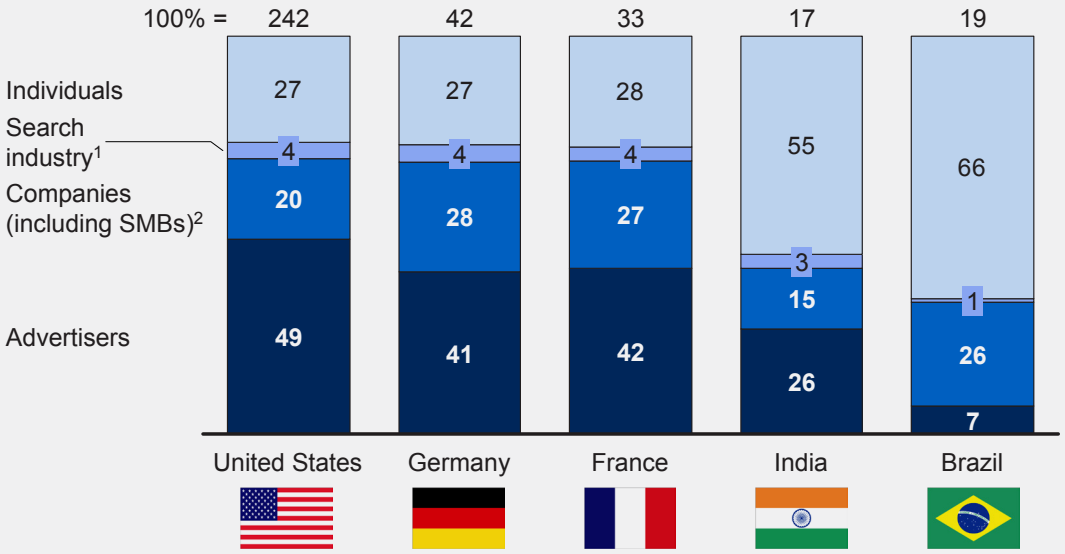
The large difference in the extent to which search contributes to GDP in developed and developing countries can be explained by the much larger percentage of total value that is captured in developing countries as a consumer surplus, which is not included in GDP. That in turn is explained by developing countries' much larger populations. This is reflected in Exhibit 26, showing that in the developed countries studied, companies gain some 70 percent of the measurable search value. In developing countries, the figure is around 40 percent. The exhibit also indicates the extent to which search value is underestimated if one narrows the gauge to the search industry. It earns only 4 percent of the value created.

Exhibit 26

Value created by search across countries, 2009

ESTIMATES

Measured value
%; USD billions



1 Search industry includes enterprise search, classified and local search, and search marketing.
2 SMBs = Small and medium-sized businesses.
NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey analysis

Yet despite the clear benefits of search to the economy, it would be a mistake to think about search only in monetary terms. For example, search helps people find information in times of emergencies, and it helps them seek out people with similar interests—perhaps a support group for those coping with disease. And it shifts the balance to empower individuals or small organizations with something to share that would otherwise reach only a small audience. None of these benefits may have an easily quantifiable economic value, but each has a positive impact on people's lives.

The future of search

Search is at an early stage of its evolution. For example, searches for video or photographic images still largely depend on text searches by file names or key words, not image searches. Likewise, services that identify scraps of music have not yet found a killer application, and technologies capable of capturing a sign in one language and translating it into another remain rudimentary. All this is work in progress.

At the same time, voice recognition has improved dramatically and is already changing the search habits of many mobile users. In addition, search technology is now being grafted onto other consumer electronics devices, and cameras are being used as scanners to read bar codes and in turn consult databases to do on-the-spot price comparisons. Although the future of search remains hard to predict given the pace of change, it seems likely that its value will only grow as we rely on it more and more.

Search technology will need to develop to keep pace with what it has helped unleash, namely, a fast-growing volume of online content: one study estimated that the amount of digital information will grow by a factor of 44 from 2009 to 2020.[110] Amid the trillions of gigabytes, the task of search technology will be to make sure the search is still quick and the results relevant. With so much more information available, the danger is that we might reach a point where the value of the time it takes to find what we are searching for is higher than the utility of finding it. Conversely, the more powerful search becomes, the more value can be distilled from a mountain of data.

Accordingly, the use of vertical search engines is on the rise. As mentioned earlier, ten times as many product searches are now executed on Amazon and eBay, both vertical sites, as on Google Product Search.[111] And Exhibit 27 shows that the number of horizontal Web searches conducted on personal computers in the United States is outstripped by vertical and mobile searches.

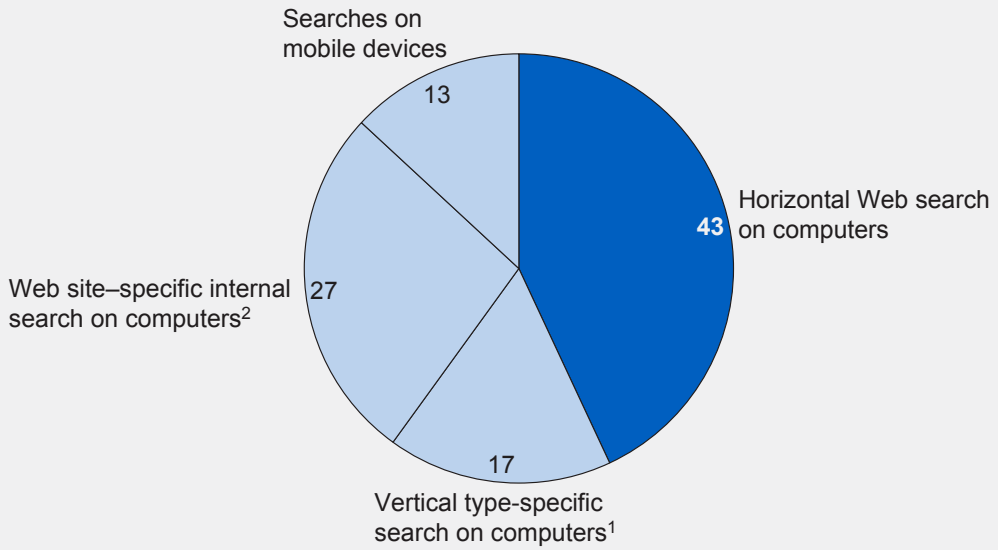
110 IDC Digital Universe Study, sponsored by EMC, May 2010. http://www.emc.com/about/news/press/2010/20100504-01.htm.

111 ComScore qSearch.

Exhibit 27

Horizontal Web searches on traditional computers are now a minority of all searches performed in France

% of total searches performed in France, 2009



1 Searches for specific types of content, e.g., images, video, within maps.
2 Searches within a specific Web site, such as Amazon, YouTube, Wikipedia.

SOURCE: ComScore; McKinsey analysis

Interest in semantic search engines, which try to understand the underlying intent of a search more accurately, is also on the rise. The increasing difficulty of finding relevant content is marked by a rise in the number of words in a search query: from 2.9 words in 2008, on average, to 3.2 in 2010.[112]

Importantly, relevant search results are increasingly deemed to be personalized. Autonomous search agents that make suggestions based on personal data, including the user's location, metadata, and more advanced algorithms, are in sight. For example, Surf Canyon, a US company, is developing real-time, personalized search capabilities that transform static lists of search results into dynamic pages that rerank results based on a user's real-time, online activity.

The importance of personalized information is also reflected in the way key players in the search industry now use the data available on social networks to enhance search results. For example, users of the Facebook social network can tag content on the Web that they find interesting by pressing a "Like" button. When a user then conducts a search, pages "Liked" by their friends will help determine the ranking of the search results, on the assumption that this makes them more relevant.

The advent of smartphones, tablets, and other Web-connected portable devices increases the potential of more personalized searches. From 2008 to 2010, mobile search traffic in most markets grew fourfold.[113] Today, some 25 percent of mobile users conduct searches on their wireless phones in the United States, as do slightly more than 30 percent in Japan, even though many still do not use smartphones. It has also been shown that people tend to search for local services more on their mobile devices than on their PCs.[114]

112 ComScore.
113 McKinsey analysis of data from Strategy Analytics, RBC Capital Markets, comScore, and Gartner press release, "Gartner says worldwide PC shipments on pace to grow 22 percent in 2010," May 26, 2010.
114 Jane Li, Scott B. Huffman, and Akihito Tokuda, *Good abandonment in mobile and PC Internet search*, Proceedings of the 32nd International ACM SIGIR Conference on Research and Development in Information Retrieval, July 19–23, 2009, Boston, MA.

As search continues to grow, new applications will undoubtedly emerge. Already, analysis of what people are searching for is being used not only to make search results more relevant but also to better understand current trends and future outcomes in society. Researchers have, for example, looked at how search activity can help predict epidemics, unemployment, consumer demand, or even stock prices. (See Box 4, "The predictive value of search.")

So what does all this mean for those who participate in the search market?

Individuals have much to look forward to. Fueled by fierce competition among search providers, the power of search is set to keep rising. Individuals will be able to conduct their searches on a range of devices, anytime, anywhere. They will be able to search more quickly and more easily than before—with voice recognition, for example. And they can expect increasingly relevant results.

The downside to be considered is that just as search enables individuals to uncover more and more information, so it makes it easier for others to uncover information about them in what some may consider an invasion of privacy.

Organizations of every hue will benefit in similar ways and perhaps have even more to gain as they have sometimes been slower than consumers to capture some of the potential power of search. Cutting-edge IT innovation once mostly occurred within enterprises that enjoyed multimillion-dollar budgets to purchase servers, deploy networks, and implement large and complex software applications. Today, search innovation has been more prolific in consumer applications, and many would argue that search technology for consumers is superior to the search tools that employees in large corporations use to find information within the enterprise.

Participants in the search market—advertisers, portals, search engines, and those that provide search platforms—are in for a turbulent ride. The competition is fierce, and as technology change accelerates, incumbents will be constantly challenged and disruptive change will become the norm. The rise of social networks marks one current industry shift that raises question about the balance between pure logic-driven, algorithmic searches and people-influenced, social searches. Fragmentation of the marketplace, by verticals, geographies (as some governments impose various types of regulatory controls), and the devices used for searching, will also make competing in the search market increasingly complex.

Policy makers will find themselves challenged as search gives rise to a whole host of issues that are difficult to arbitrate, given the ease with which information can be accessed through search. Privacy often grabs attention. Other salient issues include infringement—with many companies arguing that search engines should not index certain copyrighted or trademark-related words, images, text, or video—as well as censorship.[115] Some governments are condemned for using key-word-sniffing filters to snuff out dissident opinion; others are applauded for cracking down on, say, online gambling. Both could be argued to infringe on online freedom, making it one of the toughest issues confronting technology policy.

Moreover, any attempt by policy makers to arbitrate the interests of the different constituents in the fast-paced virtual world will likely leave them playing catch-up. Public policy tends to change much more slowly than both IT and public opinion, and online activity often escapes the bounds of any institutional frameworks that policy makers might try to impose. Laws that prevent the reporting of matters sub judice, for example, are hard to enforce on the likes of Twitter or Facebook, and search ensures a ready audience.

Researchers, too, will be playing catch-up, trying to make sense of it all. But amid all the uncertainty, one thing is sure: the full implications of search on economies and societies are only now beginning to be revealed.

115 Hannibal Travis, "The future according to Google: Technology policy from the standpoint of America's fastest-growing technology company," *Yale Journal of Law & Technology*, Spring 2008–09, Volume 11.

Box 4: The predictive value of search

Economists have long recognized that the right information[1] can help anticipate economic trends. Today, much economic data is backward-looking, with unemployment data, for example, released several days after the end of the month. In contrast, key word searches, Tweets, or Facebook activity can be tracked in real time, lending valuable insights. For example, the volume of searches for, say, "automotives and shopping" in late February may help predict March sales way ahead of the March data.[2] In a fast-changing world, knowing what is happening in the present can prove to be a crucial tool for policy makers in formulating appropriate and timely responses.[3]

Here are a few examples of how analysis of what people are searching for can help to better understand present trends and predict future outcomes.

- **Health care.** In health care, research has shown that an analysis of search activity can give up to one to two weeks' warning of a disease spreading before disease control authorities report on such problems.[4]
- **Financial markets.** Research has shown that the level of searches for stock tickers can predict abnormal stock returns and trading volumes.[5] Other research has looked at stock market movements in relation to the public mood as interpreted by the text content of daily Twitter feeds.[6]
- **Real estate.** Studies have shown that search activity can help predict housing prices and sales. One piece of research showed a strong correlation between home sales and the share of US Internet searches for "homes for sale."[7] Another showed that errors in predicting future housing sales were cut by a factor of four when using search data compared with using other indexes.[8]
- **Commercial success.** Researchers examined whether search query volumes could predict the opening-weekend box-office revenue for feature films, the first-month sales of video games, and the rank of songs on the US Billboard Hot 100 chart. In all cases, search counts were highly predictive.[9]
- **Economic trends.** German research, among other, has suggested strong correlations between key word searches and unemployment rates[10] as well as links between search data and the ability to better predict consumer confidence.[11]

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1 George Stigler, "The economics of information," *Journal of Political Economy*, June 1961, Volume 61, Number 3, pp. 213–225.

2 See Hal R. Varian and Hyunyoung Choi, *Predicting the present with Google trends*, April 2, 2009, Google Research Blog, http://googleresearch.blogspot.com/2009/04/predicting-present-with-google-trends.html.

3 For further discussion, see Florian Bersier, *Towards better policy and practice using real-time data*, March 12, 2010, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1614970.

4 Jeremy Ginsberg, Matthew Mohebbi, Rajan Patel, Lynnette Brammer, Mark Smolinski, and Larry Brilliant, "Detecting influenza epidemics using search engine query data," *Nature*, Volume 457, February 19, 2009, pp. 1012–1014.

5 Joseph Kissan, M. Babajide Wintoki, and Zelin Zhang, "Forecasting abnormal stock returns and trading volume using investor sentiment: Evidence from online search," upcoming, *International Journal of Forecasting*.

6 Johan Bollen, Huina Mao, and Xiao-Jun Zeng, "Twitter mood predicts the stock market," *Journal of Computational Science*, March 2011, Volume 2, Number 1, pp. 1–8.

7 Hopkins, Heather, "Internet searches match decline in existing home sales—revised," *Hitwise*, April 25, 2008, http://weblogs.hitwise.com/us-heather-hopkins/2008/04/internet_searches_match_declin_1.html.

8 Lynn Wu and Erik Brynjolfsson, *The future of prediction: How Google searches foreshadow housing prices and sales*, ICIS 2009 Proceedings, 2009.

9 Shared Goel, Jake M. Hofman, Sébastien Lahaie, David M. Pennock, and Duncan J. Watts, *Predicting consumer behavior with Web search*, Yahoo! Research, WWW 2010 Conference, April 26–30, 2010, Raleigh, NC.

10 Nikos Askitas and Klaus F. Zimmermann, *Google econometrics and unemployment forecasting*, German Council for Social and Economic Data, research notes, Number 41.

11 Torsten Schmidt and Simeon Vosen, *A monthly consumption indicator for Germany based on Internet search query data*, Ruhr Economic Paper Number 208, October 15, 2010.

Appendix: Methodology

The methodologies used to estimate the monetary value of search accrued by each of the constituencies have either been used elsewhere, reflect common sense, or are the best we could deploy given the available data. Where no data were available, or where the methodology was not robust, no attempt was made to quantify value. Hence, the estimates made in this report only partially reflect the overall value of search. Where it was not possible to quantify a particular source of value, we illustrate its impact qualitatively. We also illustrate the nonmonetary value of search.

Gross valuation estimates

The estimates reflect the gross value of search, and some of those benefits are not necessarily fully incremental—for example, about 20 percent of online searches in the United States lead to retail sales, be they online or offline, but some percentage of those purchases would have likely occurred even if consumers were not able to search online. Also, with regard to time saved, the fact that individual information seekers save time performing an individual search does not necessarily mean that they will reduce the overall amount of time they spend searching. They might simply conduct more searches in the same amount of time.

The following explains how search value was measured for each of the constituencies:

Advertisers

We quantified the value of search to advertisers[116] by estimating the ROI earned from paid search advertising (both online and mobile), SEO, and online classified advertising. We use a gross ROI of 9:1 (revenue:cost) for paid search and SEO in the United States based on various academic papers. For example, the value of advertising clicks has been assessed as a ratio of between $2 and $2.5 to $1,[117] and advertisers receive an average of 5 to 5.3 clicks on their search results for every one click on their advertisements when both search and advertising links appear on a page.[118] ROI was then adjusted by country to account for different levels of online advertising effectiveness (measured as [(e-commerce + ROPO[119])/(online advertising spend)]).

116 When calculating the value, we defined advertisers as organizations that use paid search advertising as well as those that benefit from natural search.

117 Hal R. Varian, "Online ad auctions," *American Economic Review: Papers & Proceedings 2009*, Volume 99, Number 2, pp. 430–434, http://www.aeaweb.org/articles.php?doi=10.1257/aer.99.2.430; Ashish Agarwal, Kartik Hosanagar, and Michael D. Smith, "Location, location, location: An analysis of profitability of position in online advertising markets," Journal *of Marketing Research*, forthcoming, http://ssrn.com/abstract=1151537; Misra, Sanjog, Edieal Pinker, and Alan Rimm-Kaufman, *An empirical study of search engine advertising effectiveness*, WISE 2006, Evanston, IL, December 9–10, 2006, http://digital.mit.edu/wise2006/papers/4A-2_PinkeretalWISE2006.pdf.

118 Bernard J. Jansen and Amanda Spink, "Investigating customer click through behaviour with integrated sponsored and nonsponsored results," *International Journal of Internet Marketing and Advertising*, 2009, Volume 5, Numbers 1/2, pp. 74–94.

119 Research Online-Purchase Offline, that is, the purchases made offline due to online research.

The ROI for online classified advertising was derived from a comScore/IAB study that estimates the ROI to be 10, of which 50 percent is attributable to search.[120]

Retailers

We quantified the value of search for retailers as the value of sales that occur because search was used at some stage in the decision-making process. This was calculated as the sum of e-commerce sales attributed to search plus ROPO. It was calculated by synthesizing the results of three sets of analyses: the ROI impact of search advertising and SEO expenditures in each country;[121] the touch points related to search at different points in the customer decision journey;[122] and the total number of searches and conversion rates.[123]

Content creators

We quantified two sources of search value for content creators: revenue from search-related advertising and revenue from content sales.

Value from advertising was estimated as the revenue content creators receive as a result of the advertising impressions driven by search. We conservatively estimated that between 20 and 25 percent of total online display advertising spend and other online advertising spend—for example, online video and rich media advertising—resulted from horizontal Web searches, and 5 to 7 percent from internal searches.

Our estimate of revenue from content sales leverages the analysis for the retail constituency. Retail value for content creators was estimated as e-commerce sales for the product subcategory of books and music and video by country and the ROPO coefficient for that subcategory by country. We assumed that around 30 percent of that value goes to content creators and that the remainder goes to distributors.

We did not attempt to quantify any value for business-to-business content creators or content creators who sell on a subscription basis, although considerable value lies here.

Enterprise

As a gauge of search value to enterprise, we calculated the value of the productivity gains made by knowledge workers.

Several existing studies have demonstrated significant productivity gains from search in different geographies.[124] We assume a conservative 10 to 15 percent gain in productivity for enterprise knowledge workers, and we assume that knowledge workers spend on average five hours per week, or about 12 percent of their time, searching online. We then took into account local wages and the number of knowledge workers per country to arrive at an estimate of the value of search in the five countries studied.

The ROI for enterprises was calculated based on an investment that took into account how much enterprises spent to deploy internal search capabilities and the amount they spent for Internet access that could be related to search. The return was based on the time saved as previously described.[125]

120 ComScore/IAB, *Classifieds ROI*, 2006, paper presented at IAB Leadership Forum: Performance Marketing Optimization, Chicago, March 13, 2006, http://www.iab.net/media/file/resources_admin_downloads_IAB_comScoreExecPreso.ppt. Used the 10:1 found across all categories of the Verizon Superpages.

121 Hal R. Varian, "Online ad auctions," *American Economic Review: Papers & Proceedings 2009*, Volume 99, Number 2, pp. 430–34, http://www.aeaweb.org/articles.php?doi=10.1257/aer.99.2.430.

122 McKinsey primary research, Digital Marketing Survey, 2007.

123 ComScore, Nielsen.

124 Yan Chen, Grace YoungJoo Jeon, and Yong-Mi Kim, *A day without a search engine: An experimental study of online and offline search*, working paper, School of Information, University of Michigan, 2010, http://yanchen.people.si.umich.edu/papers/VOS_20101115.pdf; *The hidden costs of information work*, IDC white paper, March 2005; McKinsey proprietary survey of French small and medium-sized businesses, 2010.

125 Primary McKinsey & Company research.

Consumers

This constituency consists of consumers who use search for transactional purposes, regardless of whether the purchase is eventually made online or off.

Specific estimates were calculated for the value of the time consumers save by searching for goods online and the consumer surplus they get from price transparency and better matching in the long tail.

The time saved was calculated by determining a value for an hour of a consumer's leisure time and multiplying it by the amount of time consumers saved searching while conducting purchases online. The value of a consumer's leisure time was valued at between $0.5 and $7 per hour,[126] based on average, after-tax income per household in each country, and the assumption that a consumer's leisure time was worth 65 percent of this figure.[127] Online search saves around 15 minutes per query.[128] This would imply that consumers can save up to 20 hours per year, based on estimates of the number of their searches.

The consumer surplus from price transparency was estimated by multiplying the average decrease in price resulting from search by the percentage of transactions enabled by search by the total value of e-commerce in each country. The total consumer surplus from better matching in the long tail was estimated by multiplying the value of long-tail searches resulting from search by the consumer surplus factor identified in academic studies.

The value of other consumer surplus, e.g., better matching that is not in the long tail, or the convenience of online shopping, is computed as the total consumer surplus (estimated using a derived demand curve) minus the values calculated for time saved, price transparency, and long-tail matching.

Individual information seekers

The value of search to individual information seekers is regarded as the sum of the value derived from horizontal Web searching and other informational searching, and the value of searches for entertainment.

To value these components, conjoint analysis was performed in the United States, France, Germany, and Russia, in which individuals were asked to value certain services on the Internet such as Web searches, access to directories, and social networks. We then estimated the impact of search on each of these services based on estimates of the percentage of pages viewed per category that result from search. Gross value was calculated as the value per Internet user per country, multiplied by the total number of Internet users. The number of Internet users is based on 2009 figures.[129] The numbers for Russia were applied to India and Brazil. The three countries have roughly the same broadband Internet penetration (around 30 percent), and similar proportions of their populations watch videos online (20 to 30 percent). The monthly price of a broadband connection is currently about $15 in India and Russia and $30 in Brazil. We excluded entertainment value for nonbroadband users.

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ROI for individuals

The ROI for individuals in their roles as consumers and individual information seekers was based on an investment that included a fraction of their total Internet expenses, based on the percentage of what they would pay for search versus other Internet services, i.e., approximately 20 percent. The return was estimated based on what individuals would pay in their roles as consumers and individual information seekers.[130]

Entrepreneurs, individual content creators, health care, education, government

These were not quantified.

Methodology for calculating the total value of search

The bottom-up values estimated for the various constituencies cannot be added to give country-level estimates because there are certain overlaps. For example, retailers are also advertisers, so simply adding these two values together would be to partly double count. Therefore, to estimate the total value of search, we used a top-down methodology.

We began by estimating the total value of search in each of the five countries. This was done by estimating the three categories of value creation that have a direct impact on GDP; the indirect contribution to GDP from ROPO; and two categories of value creation that are not included in GDP measures.

The three categories of value that have a direct impact on GDP are the productivity gains enjoyed by enterprises, the value accrued by advertisers, and the profits made by search engine providers. We took an income approach to estimating GDP impact. To estimate the productivity gains made by enterprise as a result of search, we applied the methodology previously described for this particular constituency. To estimate the value that accrues to advertisers, we used the same ROI-based methodology already described. We estimated the profits generated by search engine providers by multiplying the gross margins for different types of search-related advertising by the total spent on advertising in each country.

The two categories not captured in GDP statistics for which we estimated a value were the surplus to consumers and the surplus to individual information seekers. The methodology for measuring these two categories is previously described under the relevant sections.

Having estimated the value of search in each of the five countries studied, we estimated the global value of search by scaling up our findings. The average value of search as a percentage of GDP in France and Germany was applied to other developed economies, and the average value of search as a percentage of GDP for Brazil and India was applied to other developing economies.

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