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SEO services

SEO services in Sydney

SEO services in Sydney

on-page audit"An on-page audit evaluates the elements of a web page, such as meta tags, headings, and content quality. By identifying areas for improvement, an audit helps refine on-page optimization efforts and boosts search engine performance."

on-page audit tools"On-page audit tools help identify optimization opportunities, such as missing meta tags, broken links, or keyword usage gaps. Best SEO Sydney Agency. By using these tools, you can streamline your optimization efforts and improve overall page performance."

on-page content freshness"On-page content freshness refers to how current and updated the content is. Best SEO Agency Sydney Australia. Regularly refreshing and expanding content signals to search engines that the page is up-to-date, which can improve rankings and keep users coming back."

SEO services in Sydney —

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- SEO services provider
- SEO services Sydney
- SEO services Sydney
- SEO specialist
- SEO specialists Sydney

on-page content optimization"On-page content optimization refers to the process of improving individual web pages to increase visibility and relevance. Best Search Engine Optimisation Services. This includes optimizing meta tags, headers, and images, as well as ensuring that the content is keyword-rich and user-friendly."

on-page engagement signals"On-page engagement signals include metrics like time on page, bounce rate, and click-through rate. Improving these signals by enhancing content quality and user experience can positively impact search rankings and attract more traffic."

on-page keyword research"On-page keyword research involves identifying the most relevant and valuable keywords for a specific page. By targeting the right keywords, you increase the pages relevance, attract more qualified traffic, and improve its search rankings."

SEO services - Google Knowledge Graph

1. Google structured data
2. Meta tags optimization
3. Googles mobile-first indexing

SEO services provider

on-page keyword variation"On-page keyword variation involves using different forms and synonyms of your target keyword throughout the content. This helps avoid keyword stuffing, provides a more natural reading experience, and increases the pages relevance for multiple search terms."

on-page keywords"On-page keywords are the targeted search terms included within the content, headings, and meta tags of a web page.

SEO services - Organic search performance

1. Google search intent categories
2. Organic search performance
3. Google Knowledge Graph

SEO Audit . By using these keywords strategically and naturally, you help search engines understand the pages topic and improve its relevance in search results."

on-page link optimization"On-page link optimization ensures that internal and external links are relevant, functional, and properly anchored. Effective link optimization improves site navigation, enhances user experience, and helps search engines crawl and understand your site."

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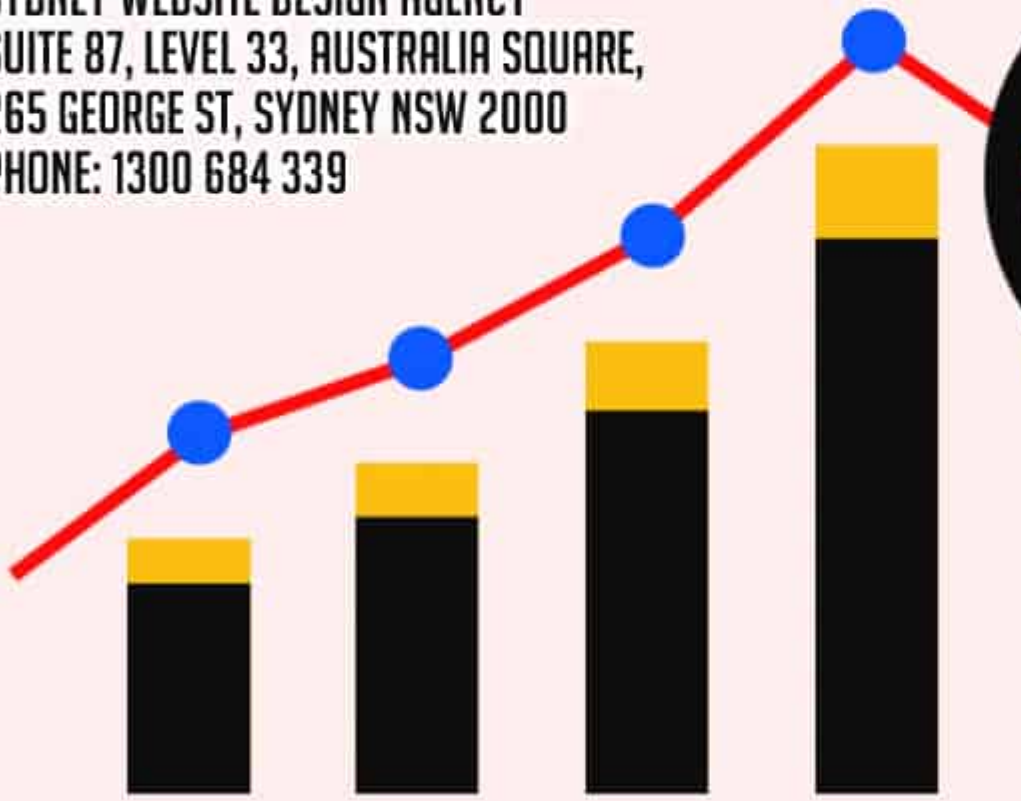
HELPS BUSINESS GROW OR

SYDNEY WEBSITE DESIGN AGENCY
SUITE 87, LEVEL 33, AUSTRALIA SQUARE,
265 GEORGE ST, SYDNEY NSW 2000
PHONE: 1300 684 339



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on-page readability checks"On-page readability checks ensure that your content is easy to read, comprehend, and navigate. By improving readability, you enhance user engagement, reduce bounce rates, and increase the pages relevance in search results."

on-page relevance"On-page relevance refers to how closely your content aligns with the keywords youre targeting. By creating high-quality, targeted content, you increase the pages relevance, improve user engagement, and boost search rankings."

on-page SEO"On-page SEO refers to the practice of optimizing individual web pages to improve search rankings and drive organic traffic. This involves using relevant keywords in content, ensuring proper heading structure, adding meta tags, and improving URL formats for better readability and indexing."

comprehensive SEO Packages Sydney services.

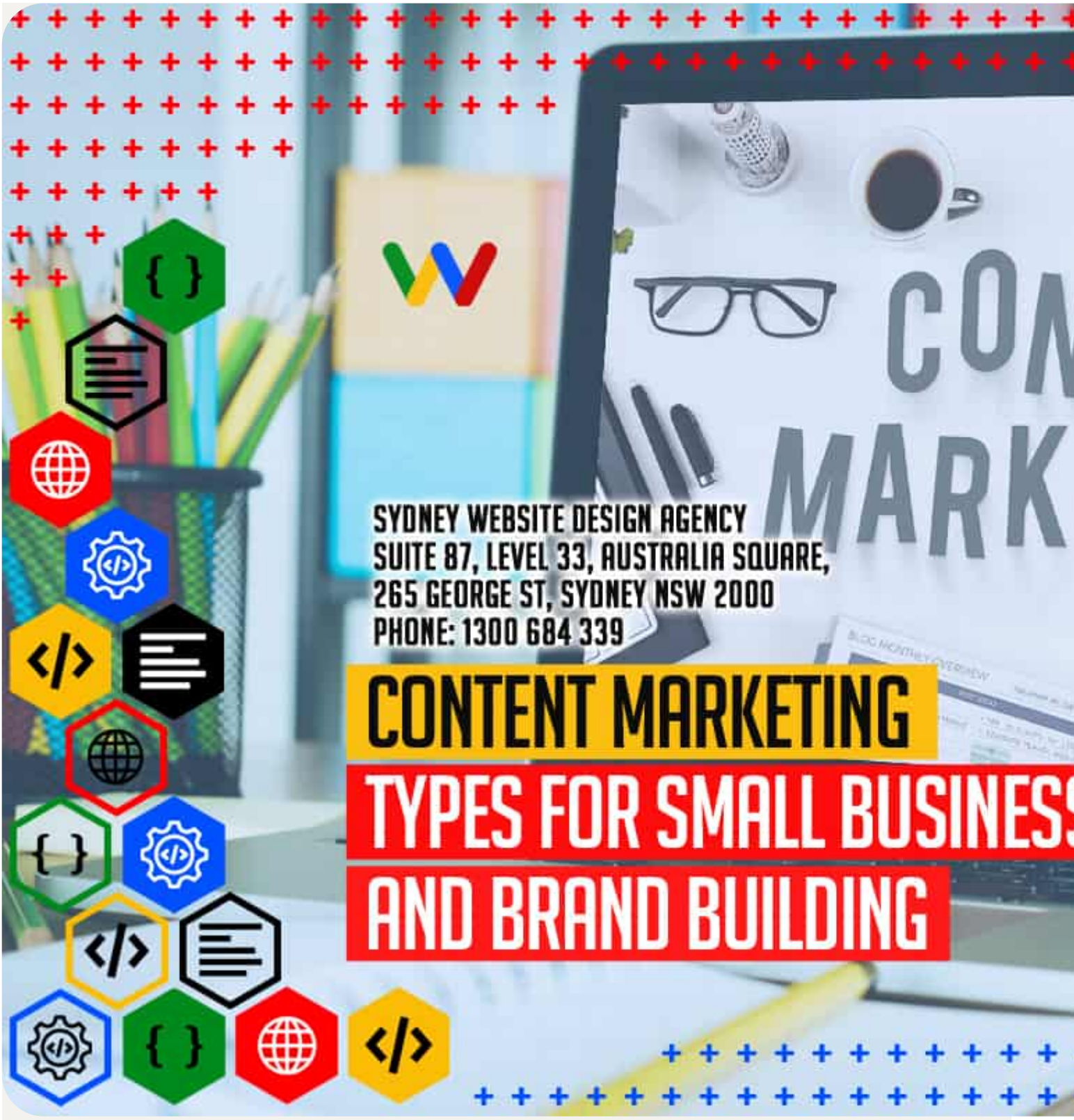
SEO services Sydney

on-page SEO"On-page SEO refers to optimizing individual web pages to rank higher in search engine results. It involves improving content quality, optimizing meta tags, using appropriate headings, and structuring the sites internal links to enhance both user experience and search engine visibility."

on-page SEO checklist"An on-page SEO checklist outlines all the key elements to optimize, including meta tags, headings, content quality, and internal links. By following a checklist, you ensure that every aspect of the page is optimized for better rankings."

on-page SEO improvements"On-page SEO improvements focus on optimizing elements like meta tags, headings, and content structure. Making these adjustments enhances the pages relevance, increases search engine visibility, and improves overall performance."


KEY ADVANTAGE
LOCAL SEO S
28



SEO specialist

optimized image alt attributes"Alt attributes provide descriptive text for images, helping search engines and screen readers understand their content. Optimizing these attributes with relevant keywords improves accessibility and boosts search visibility."

optimized image backup solutions"Optimized image backup solutions store compressed and resized versions of your files, ensuring you always have access to efficient, web-ready images. Reliable backups help maintain site quality and improve recovery times if issues arise."

optimized image delivery networks"Delivery networks, such as CDNs, distribute image files to servers closer to users, improving load times and reliability. Optimized delivery ensures that images load quickly and consistently, enhancing user experience and search performance."

SEO specialists Sydney

optimized image dimensions"Using the correct dimensions for images prevents slow load times and distorted displays. By setting optimized dimensions, you ensure that images look great on all devices and contribute to a faster, more user-friendly site."

optimized image file naming conventions"Consistent naming conventions improve organization, searchability, and SEO performance. By using logical, descriptive filenames, you ensure that images are easy to find and contribute to a well-structured site."

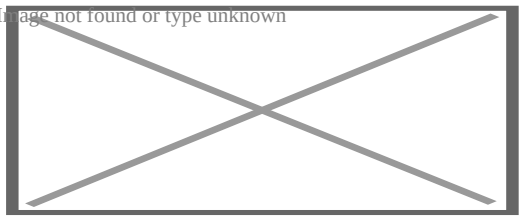
optimized image file storage"Efficient image file storage organizes images into logical directories, reduces duplication, and makes it easier to manage and update your visuals. Proper storage solutions improve site maintenance and ensure consistent performance."

SEO services - Google Knowledge Graph

- SEO content strategies
- Google keyword rankings

About Semantic Web

Image not found or type unknown



A tag cloud (a typical Web 3.0 phenomenon in itself) presenting Web 3.0 themes

- **v**
- **t**
- **e**

Semantics

- **Linguistic**
- **Logical**

Subfields

- Computational
- Lexical (lexis, lexicology)
- Statistical
- Structural

Topics

- Analysis
- Compositionality
- Context
- - Prototype theory
  - Force dynamics
- Semantic feature
- Semantic gap
- Theory of descriptions

Analysis

- Latent
- Computational
- Machine-learning

Applications

- Semantic file system
- Semantic desktop
- Semantic matching
- Semantic parsing
- Semantic similarity
- Semantic query
- - Semantic Web
  - Semantic wiki

Semantics of programming languages

Types

- Action
- Algebraic
- Axiomatic
- Categorical
- Concurrency
- Denotational
- Game
- Operational
- Predicate transformational

Theory

- Abstract interpretation
- Abstract semantic graph

- Language
- Linguistics

The **Semantic Web**, sometimes known as **Web 3.0** (not to be confused with Web3), is an extension of the World Wide Web through standards[1] set by the World Wide Web Consortium (W3C). The goal of the Semantic Web is to make Internet data machine-readable.

To enable the encoding of semantics with the data, technologies such as Resource Description Framework (RDF)[2] and Web Ontology Language (OWL)[3] are used. These technologies are used to formally represent metadata. For example, ontology can describe concepts, relationships between entities, and categories of things. These embedded semantics offer significant advantages such as reasoning over data and operating with heterogeneous data sources.[4] These standards promote common data formats and exchange protocols on the Web, fundamentally the RDF. According to the W3C, "The Semantic Web provides a common framework that allows data to be shared and reused across application, enterprise, and community boundaries."[5] The Semantic Web is therefore regarded as an integrator across different content and information applications and systems.

History

[edit]

The term was coined by Tim Berners-Lee for a web of data (or **data web**)[6] that can be processed by machines[7]—that is, one in which much of the meaning is machine-readable.

While its critics have questioned its feasibility, proponents argue that applications in library and information science, industry, biology and human sciences research have already proven the validity of the original concept.[8]

Berners-Lee originally expressed his vision of the Semantic Web in 1999 as follows:

> I have a dream for the Web [in which computers] become capable of analyzing all the data on the Web – the content, links, and transactions between people and computers. A "Semantic Web", which makes this possible, has yet to emerge, but when it does, the day-to-day mechanisms of trade, bureaucracy and our daily lives will be handled by machines talking to machines. The "intelligent agents" people have touted for ages will finally materialize.[9]

The 2001 *Scientific American* article by Berners-Lee, Hendler, and Lassila described an expected evolution of the existing Web to a Semantic Web.[10] In 2006, Berners-Lee and colleagues stated that: "This simple idea…remains largely unrealized".[11] In 2013, more than four million Web domains (out of roughly 250 million total) contained Semantic Web markup.[12]

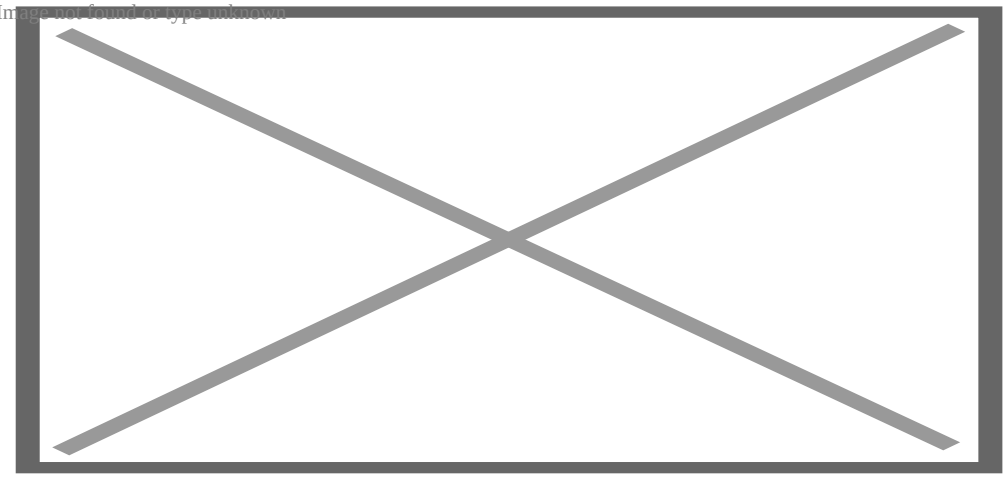
Example

[edit]

In the following example, the text "Paul Schuster was born in Dresden" on a website will be annotated, connecting a person with their place of birth. The following HTML fragment shows how a small graph is being described, in RDFa-syntax using a schema.org vocabulary and a Wikidata ID:

```
<div vocab="https://schema.org/" typeof="Person">
  <span property="name">Paul Schuster</span> was born in
  <span property="birthPlace" typeof="Place" href="https://www.wikidata.org/entity/Q1731">
    <span property="name">Dresden</span>.
  </span>
</div>
```

Image not found or type unknown

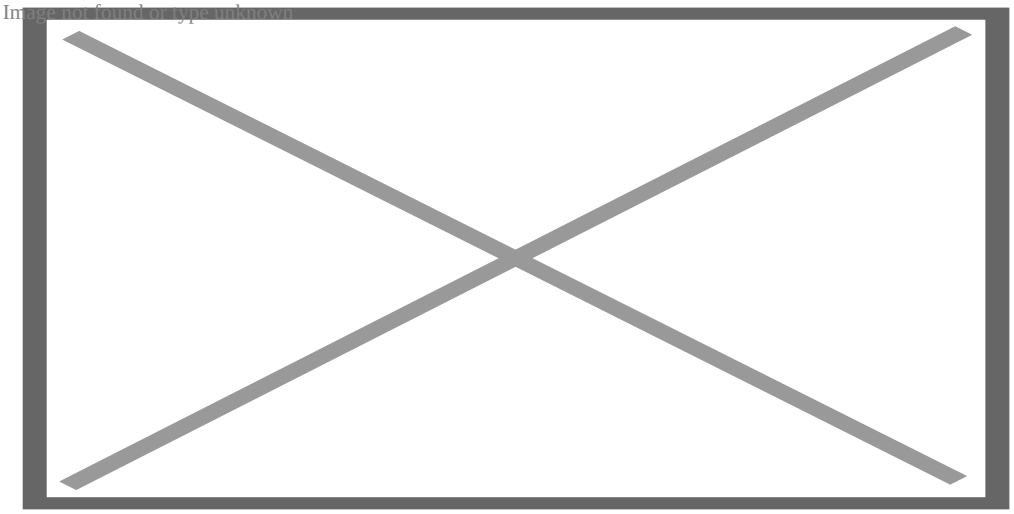


Graph resulting from the RDFa example

The example defines the following five triples (shown in Turtle syntax). Each triple represents one edge in the resulting graph: the first element of the triple (the *subject*) is the name of the node where the edge starts, the second element (the *predicate*) the type of the edge, and the last and third element (the *object*) either the name of the node where the edge ends or a literal value (e.g. a text, a number, etc.).

```
_:a <https://www.w3.org/1999/02/22-rdf-syntax-ns#type> <https://schema.org/Person> .
_:a <https://schema.org/name> "Paul Schuster" .
_:a <https://schema.org/birthPlace> <https://www.wikidata.org/entity/Q1731> .
<https://www.wikidata.org/entity/Q1731> <https://schema.org/itemtype> <https://schema.org/Place> .
<https://www.wikidata.org/entity/Q1731> <https://schema.org/name> "Dresden" .
```

The triples result in the graph shown in the given figure.



Graph resulting from the RDFa example, enriched with further data from the Web

One of the advantages of using Uniform Resource Identifiers (URIs) is that they can be dereferenced using the HTTP protocol. According to the so-called Linked Open Data principles, such a dereferenced URI should result in a document that offers further data about the given URI. In this example, all URIs, both for edges and nodes (e.g. http://schema.org/Person, http://schema.org/birthPlace, http://www.wikidata.org/entity/Q1731) can be dereferenced and will result in further RDF graphs, describing the URI, e.g. that Dresden is a city in Germany, or that a person, in the sense of that URI, can be fictional.

The second graph shows the previous example, but now enriched with a few of the triples from the documents that result from dereferencing https://schema.org/Person (green edge) and https://www.wikidata.org/entity/Q1731 (blue edges).

Additionally to the edges given in the involved documents explicitly, edges can be automatically inferred: the triple

_:a <https://www.w3.org/1999/02/22-rdf-syntax-ns#type> <http://schema.org/Person> .

from the original RDFa fragment and the triple

<https://schema.org/Person> <http://www.w3.org/2002/07/owl#equivalentClass> <http://xmlns.com/fo

from the document at https://schema.org/Person (green edge in the figure) allow to infer the following triple, given OWL semantics (red dashed line in the second Figure):

_:a <https://www.w3.org/1999/02/22-rdf-syntax-ns#type> <http://xmlns.com/foaf/0.1/Person> .

Background

[edit]
Further information: Semantic network § History

The concept of the semantic network model was formed in the early 1960s by researchers such as the cognitive scientist Allan M. Collins, linguist Ross Quillian and psychologist Elizabeth F. Loftus as a form to represent semantically structured knowledge. When applied in the context of the modern internet, it extends the network of hyperlinked human-readable web pages by inserting machine-readable metadata about pages and how they are related to each other. This enables automated agents to access the Web more intelligently and perform more tasks on behalf of users. The term "Semantic Web" was coined by Tim Berners-Lee,[7] the inventor of the World Wide Web and director of the World Wide Web Consortium ("W3C"), which oversees the development of proposed Semantic Web standards. He defines the Semantic Web as "a web of data that can be processed directly and indirectly by machines".

Many of the technologies proposed by the W3C already existed before they were positioned under the W3C umbrella. These are used in various contexts, particularly those dealing with information that encompasses a limited and defined domain, and where sharing data is a common necessity, such as scientific research or data exchange among businesses. In addition, other technologies with similar goals have emerged, such as microformats.

Limitations of HTML

[edit]

Many files on a typical computer can be loosely divided into either human-readable documents, or machine-readable data. Examples of human-readable document files are mail messages, reports, and brochures. Examples of machine-readable data files are calendars, address books, playlists, and spreadsheets, which are presented to a user using an application program that lets the files be viewed, searched, and combined.

Currently, the World Wide Web is based mainly on documents written in Hypertext Markup Language (HTML), a markup convention that is used for coding a body of text interspersed with multimedia objects such as images and interactive forms. Metadata tags provide a method by which computers can categorize the content of web pages. In the examples below, the field names "keywords", "description" and "author" are assigned values such as "computing", and "cheap widgets for sale" and "John Doe".

```
<meta name="keywords" content="computing, computer studies, computer" />
<meta name="description" content="Cheap widgets for sale" />
<meta name="author" content="John Doe" />
```

Because of this metadata tagging and categorization, other computer systems that want to access and share this data can easily identify the relevant values.

With HTML and a tool to render it (perhaps web browser software, perhaps another user agent), one can create and present a page that lists items for sale. The HTML of this catalog page can make simple, document-level assertions such as "this document's title is 'Widget Superstore' ", but there is no capability within the HTML itself to assert unambiguously that, for example, item number X586172 is an Acme Gizmo with a retail price of €199, or that it is a consumer product. Rather, HTML can only say that the span of text "X586172" is something that should be positioned near "Acme Gizmo" and "€199", etc. There is no way to say "this is a catalog" or even to establish that "Acme Gizmo" is a kind of title or that "€199" is a price. There is also no way to express that these pieces of information are bound together in describing a discrete item, distinct from other items perhaps listed on the page.

Semantic HTML refers to the traditional HTML practice of markup following intention, rather than specifying layout details directly. For example, the use of denoting "emphasis" rather than <i>, which specifies italics. Layout details are left up to the browser, in combination with Cascading Style Sheets. But this practice falls short of specifying the semantics of objects such as items for sale or prices.

Microformats extend HTML syntax to create machine-readable semantic markup about objects including people, organizations, events and products.[13] Similar initiatives include RDFa, Microdata and Schema.org.

Semantic Web solutions

[edit]

The Semantic Web takes the solution further. It involves publishing in languages specifically designed for data: Resource Description Framework (RDF), Web Ontology Language (OWL), and Extensible Markup Language (XML). HTML describes documents and the links between them. RDF, OWL, and XML, by contrast, can describe arbitrary things such as people, meetings, or airplane parts.

These technologies are combined in order to provide descriptions that supplement or replace the content of Web documents. Thus, content may manifest itself as descriptive data stored in Web-accessible databases,[14] or as markup within documents (particularly, in Extensible HTML (XHTML) interspersed with XML, or, more often, purely in XML, with layout or rendering cues stored separately). The machine-readable descriptions enable content managers to add meaning to the content, i.e., to describe the structure of the knowledge we have about that content. In this way, a machine can process knowledge itself, instead of text, using processes similar to human deductive reasoning and inference, thereby obtaining more meaningful results and helping computers to perform automated information gathering and research.

An example of a tag that would be used in a non-semantic web page:

<item>blog</item>

Encoding similar information in a semantic web page might look like this:

<item rdf:about="https://example.org/semantic-web/">Semantic Web</item>

Tim Berners-Lee calls the resulting network of Linked Data the Giant Global Graph, in contrast to the HTML-based World Wide Web. Berners-Lee posits that if the past was document sharing, the future is data sharing. His answer to the question of "how" provides three points of instruction. One, a URL should point to the data. Two, anyone accessing the URL should get data back. Three, relationships in the data should point to additional URLs with data.

Tags and identifiers

[edit]

Tags, including hierarchical categories and tags that are collaboratively added and maintained (e.g. with folksonomies) can be considered part of, of potential use to or a step towards the semantic Web vision.[15][16][17]

Unique identifiers, including hierarchical categories and collaboratively added ones, analysis tools and metadata, including tags, can be used to create forms of semantic webs – webs that are to a certain degree semantic.[18] In particular, such has been used for structuring scientific research i.a. by research topics and scientific fields by the projects OpenAlex,[19][20][21] Wikidata and Scholia which are under development and provide APIs, Web-pages, feeds and graphs for various semantic queries.

Web 3.0

[edit]

Tim Berners-Lee has described the Semantic Web as a component of Web 3.0.[22]

> People keep asking what Web 3.0 is. I think maybe when you've got an overlay of scalable vector graphics – everything rippling and folding and looking misty – on Web 2.0 and access to a semantic Web integrated across a huge space of data, you'll have access to an unbelievable data resource …
>
> —Ãƒ Â¢Ã¢â€šÂ¬Ã…Â *Tim Berners-Lee, 2006*

"Semantic Web" is sometimes used as a synonym for "Web 3.0",[23] though the definition of each term varies.

Beyond Web 3.0

[edit]

The next generation of the Web is often termed Web 4.0, but its definition is not clear. According to some sources, it is a Web that involves artificial intelligence,[24] the internet of things, pervasive computing, ubiquitous computing and the Web of Things among other concepts.[25] According to the European Union, Web 4.0 is "the expected fourth generation of the World Wide Web. Using advanced artificial and ambient intelligence, the internet of things, trusted blockchain transactions, virtual worlds and XR capabilities, digital and real objects and environments are fully integrated and communicate with each other, enabling truly intuitive, immersive experiences, seamlessly blending the physical and digital worlds".[26]

Challenges

[edit]

Some of the challenges for the Semantic Web include vastness, vagueness, uncertainty, inconsistency, and deceit. Automated reasoning systems will have to deal with all of these issues in order to deliver on the promise of the Semantic Web.

- Vastness: The World Wide Web contains many billions of pages. The SNOMED CT medical terminology ontology alone contains 370,000 class names, and existing technology has not yet been able to eliminate all semantically duplicated terms. Any automated reasoning system will have to deal with truly huge inputs.
- Vagueness: These are imprecise concepts like "young" or "tall". This arises from the vagueness of user queries, of concepts represented by content providers, of matching query terms to provider terms and of trying to combine different knowledge bases with overlapping but subtly different concepts. Fuzzy logic is the most common technique for dealing with vagueness.
- Uncertainty: These are precise concepts with uncertain values. For example, a patient might present a set of symptoms that correspond to a number of different distinct diagnoses each with a different probability. Probabilistic reasoning techniques are generally employed to address uncertainty.
- Inconsistency: These are logical contradictions that will inevitably arise during the development of large ontologies, and when ontologies from separate sources are combined. Deductive reasoning fails catastrophically when faced with inconsistency, because "anything follows from a contradiction". Defeasible reasoning and paraconsistent reasoning are two techniques that can be employed to deal with inconsistency.
- Deceit: This is when the producer of the information is intentionally misleading the consumer of the information. Cryptography techniques are currently utilized to alleviate this threat. By providing a means to determine the information's integrity, including that which relates to the identity of the entity that produced or published the information, however credibility issues still have to be addressed in cases of potential deceit.

This list of challenges is illustrative rather than exhaustive, and it focuses on the challenges to the "unifying logic" and "proof" layers of the Semantic Web. The World Wide Web Consortium (W3C) Incubator Group for Uncertainty Reasoning for the World Wide Web[27] (URW3-XG) final report lumps these problems together under the single heading of "uncertainty".[28] Many of the techniques mentioned here will require extensions to the Web Ontology Language (OWL) for example to annotate conditional probabilities. This is an area of active research.[29]

Standards

[edit]

Standardization for Semantic Web in the context of Web 3.0 is under the care of W3C.[30]

Components

[edit]

The term "Semantic Web" is often used more specifically to refer to the formats and technologies that enable it.[5] The collection, structuring and recovery of linked data are enabled by technologies that provide a formal description of concepts, terms, and relationships

within a given knowledge domain. These technologies are specified as W3C standards and include:

- Resource Description Framework (RDF), a general method for describing information
- RDF Schema (RDFS)
- Simple Knowledge Organization System (SKOS)
- SPARQL, an RDF query language
- Notation3 (N3), designed with human readability in mind
- N-Triples, a format for storing and transmitting data
- Turtle (Terse RDF Triple Language)
- Web Ontology Language (OWL), a family of knowledge representation languages
- Rule Interchange Format (RIF), a framework of web rule language dialects supporting rule interchange on the Web
- JavaScript Object Notation for Linked Data (JSON-LD), a JSON-based method to describe data
- ActivityPub, a generic way for client and server to communicate with each other. This is used by the popular decentralized social network Mastodon.

The Semantic Web Stack illustrates the architecture of the Semantic Web. The functions and relationships of the components can be summarized as follows:[31]

- XML provides an elemental syntax for content structure within documents, yet associates no semantics with the meaning of the content contained within. XML is not at present a necessary component of Semantic Web technologies in most cases, as alternative syntaxes exist, such as Turtle. Turtle is a de facto standard, but has not been through a formal standardization process.
- XML Schema is a language for providing and restricting the structure and content of elements contained within XML documents.
- RDF is a simple language for expressing data models, which refer to objects ("web resources") and their relationships. An RDF-based model can be represented in a variety of syntaxes, e.g., RDF/XML, N3, Turtle, and RDFa. RDF is a fundamental standard of the Semantic Web.[32][33]
- RDF Schema extends RDF and is a vocabulary for describing properties and classes of RDF-based resources, with semantics for generalized-hierarchies of such properties and classes.
- OWL adds more vocabulary for describing properties and classes: among others, relations between classes (e.g. disjointness), cardinality (e.g. "exactly one"), equality, richer typing of properties, characteristics of properties (e.g. symmetry), and enumerated classes.
- SPARQL is a protocol and query language for semantic web data sources.
- RIF is the W3C Rule Interchange Format. It is an XML language for expressing Web rules that computers can execute. RIF provides multiple versions, called dialects. It includes a RIF Basic Logic Dialect (RIF-BLD) and RIF Production Rules Dialect (RIF PRD).

Current state of standardization

[edit]

Well-established standards:

- RDF - Resource Description Framework
- RDFS - Resource Description Framework Schema
- RIF - Rule Interchange Format
- SPARQL - 'SPARQL Protocol and RDF Query Language'
- Unicode
- URI - Uniform Resource Identifier
- OWL - Web Ontology Language
- XML - Extensible Markup Language

Not yet fully realized:

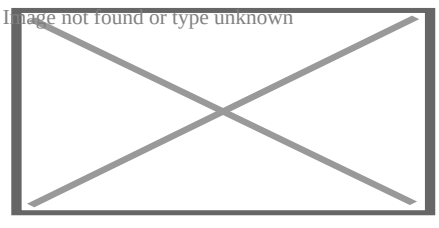
- Unifying Logic and Proof layers
- SWRL - Semantic Web Rule Language

Applications

[edit]

The intent is to enhance the usability and usefulness of the Web and its interconnected resources by creating semantic web services, such as:

- Servers that expose existing data systems using the RDF and SPARQL standards. Many converters to RDF exist from different applications.[34] Relational databases are an important source. The semantic web server attaches to the existing system without affecting its operation.
- Documents "marked up" with semantic information (an extension of the HTML <meta> tags used in today's Web pages to supply information for Web search engines using web crawlers). This could be machine-understandable information about the human-understandable content of the document (such as the creator, title, description, etc.) or it could be purely metadata representing a set of facts (such as resources and services elsewhere on the site). Note that *anything* that can be identified with a *Uniform Resource Identifier* (URI) can be described, so the semantic web can reason about animals, people, places, ideas, etc. There are four semantic annotation formats that can be used in HTML documents; Microformat, RDFa, Microdata and JSON-LD.[35] Semantic markup is often generated automatically, rather than manually.



Arguments as distinct semantic units with specified relations and version control on Kialo

- Common metadata vocabularies (ontologies) and maps between vocabularies that allow document creators to know how to mark up their documents so that agents can use the information in the supplied metadata (so that *Author* in the sense of 'the Author of the page' will not be confused with *Author* in the sense of a book that is the subject of a book review).
- Automated agents to perform tasks for users of the semantic web using this data.
- Semantic translation. An alternative or complementary approach are improvements to contextual and semantic understanding of texts – these could be aided via Semantic Web methods so that only increasingly small numbers of mistranslations need to be corrected in manual or semi-automated post-editing.
- Web-based services (often with agents of their own) to supply information specifically to agents, for example, a Trust service that an agent could ask if some online store has a history of poor service or spamming.
- Semantic Web ideas are implemented in collaborative structured argument mapping sites where their relations are organized semantically, arguments can be mirrored (linked) to multiple places, reused (copied), rated, and changed as semantic distinct units. Ideas for such, or a more widely adopted "World Wide Argument Web", go back to at least 2007[36] and have been implemented to some degree in Argüman[37] and Kialo. Further steps towards semantic web services may include enabling "Querying", argument search engines,[38] and "summarizing the contentious and agreed-upon points of a discussion".[39]

Such services could be useful to public search engines, or could be used for knowledge management within an organization. Business applications include:

- Facilitating the integration of information from mixed sources[40]
- Dissolving ambiguities in corporate terminology
- Improving information retrieval thereby reducing information overload and increasing the refinement and precision of the data retrieved[41][42][43][44]
- Identifying relevant information with respect to a given domain[45]
- Providing decision making support

In a corporation, there is a closed group of users and the management is able to enforce company guidelines like the adoption of specific ontologies and use of semantic annotation. Compared to the public Semantic Web there are lesser requirements on scalability and the information circulating within a company can be more trusted in general; privacy is less of an issue outside of handling of customer data.

Skeptical reactions

[edit]

Practical feasibility

[edit]

Critics question the basic feasibility of a complete or even partial fulfillment of the Semantic Web, pointing out both difficulties in setting it up and a lack of general-purpose usefulness that prevents the required effort from being invested. In a 2003 paper, Marshall and Shipman point out the cognitive overhead inherent in formalizing knowledge, compared to the authoring of traditional web hypertext:[46]

> While learning the basics of HTML is relatively straightforward, learning a knowledge representation language or tool requires the author to learn about the representation's methods of abstraction and their effect on reasoning. For example, understanding the class-instance relationship, or the superclass-subclass relationship, is more than understanding that one concept is a "type of" another concept. [...] These abstractions are taught to computer scientists generally and knowledge engineers specifically but do not match the similar natural language meaning of being a "type of" something. Effective use of such a formal representation requires the author to become a skilled knowledge engineer in addition to any other skills required by the domain. [...] Once one has learned a formal representation language, it is still often much more effort to express ideas in that representation than in a less formal representation [...]. Indeed, this is a form of programming based on the declaration of semantic data and requires an understanding of how reasoning algorithms will interpret the authored structures.

According to Marshall and Shipman, the tacit and changing nature of much knowledge adds to the knowledge engineering problem, and limits the Semantic Web's applicability to specific domains. A further issue that they point out are domain- or organization-specific ways to express knowledge, which must be solved through community agreement rather than only technical means.[46] As it turns out, specialized communities and organizations for intra-company projects have tended to adopt semantic web technologies greater than peripheral and less-specialized communities.[47] The practical constraints toward adoption have appeared less challenging where domain and scope is more limited than that of the general public and the World-Wide Web.[47]

Finally, Marshall and Shipman see pragmatic problems in the idea of (Knowledge Navigator-style) intelligent agents working in the largely manually curated Semantic Web:[46]

> In situations in which user needs are known and distributed information resources are well described, this approach can be highly effective; in situations that are not foreseen and that bring together an unanticipated array of information resources, the Google approach is more robust. Furthermore, the Semantic Web relies on inference

> chains that are more brittle; a missing element of the chain results in a failure to perform the desired action, while the human can supply missing pieces in a more Google-like approach. [...] cost-benefit tradeoffs can work in favor of specially-created Semantic Web metadata directed at weaving together sensible well-structured domain-specific information resources; close attention to user/customer needs will drive these federations if they are to be successful.

Cory Doctorow's critique ("metacrap")[48] is from the perspective of human behavior and personal preferences. For example, people may include spurious metadata into Web pages in an attempt to mislead Semantic Web engines that naively assume the metadata's veracity. This phenomenon was well known with metatags that fooled the Altavista ranking algorithm into elevating the ranking of certain Web pages: the Google indexing engine specifically looks for such attempts at manipulation. Peter Gärdenfors and Timo Honkela point out that logic-based semantic web technologies cover only a fraction of the relevant phenomena related to semantics.[49][50]

Censorship and privacy

[edit]

Enthusiasm about the semantic web could be tempered by concerns regarding censorship and privacy. For instance, text-analyzing techniques can now be easily bypassed by using other words, metaphors for instance, or by using images in place of words. An advanced implementation of the semantic web would make it much easier for governments to control the viewing and creation of online information, as this information would be much easier for an automated content-blocking machine to understand. In addition, the issue has also been raised that, with the use of FOAF files and geolocation meta-data, there would be very little anonymity associated with the authorship of articles on things such as a personal blog. Some of these concerns were addressed in the "Policy Aware Web" project[51] and is an active research and development topic.

Doubling output formats

[edit]

Another criticism of the semantic web is that it would be much more time-consuming to create and publish content because there would need to be two formats for one piece of data: one for human viewing and one for machines. However, many web applications in development are addressing this issue by creating a machine-readable format upon the publishing of data or the request of a machine for such data. The development of microformats has been one reaction to this kind of criticism. Another argument in defense of the feasibility of semantic web is the likely falling price of human intelligence tasks in digital labor markets, such as Amazon's Mechanical Turk.[*citation needed*]

Specifications such as eRDF and RDFa allow arbitrary RDF data to be embedded in HTML pages. The GRDDL (Gleaning Resource Descriptions from Dialects of Language) mechanism allows existing material (including microformats) to be automatically interpreted as RDF, so publishers only need to use a single format, such as HTML.

Research activities on corporate applications

[edit]

The first research group explicitly focusing on the Corporate Semantic Web was the ACACIA team at INRIA-Sophia-Antipolis, founded in 2002. Results of their work include the RDF(S) based Corese[52] search engine, and the application of semantic web technology in the realm of distributed artificial intelligence for knowledge management (e.g. ontologies and multi-agent systems for corporate semantic Web) [53] and E-learning.[54]

Since 2008, the Corporate Semantic Web research group, located at the Free University of Berlin, focuses on building blocks: Corporate Semantic Search, Corporate Semantic Collaboration, and Corporate Ontology Engineering.[55]

Ontology engineering research includes the question of how to involve non-expert users in creating ontologies and semantically annotated content[56] and for extracting explicit knowledge from the interaction of users within enterprises.

Future of applications

[edit]

Tim O'Reilly, who coined the term Web 2.0, proposed a long-term vision of the Semantic Web as a web of data, where sophisticated applications are navigating and manipulating it.[57] The data web transforms the World Wide Web from a distributed file system into a distributed database.[58]

See also

[edit]

- AGRIS
- Business semantics management
- Computational semantics
- Calais (Reuters product)
- DBpedia
- Entity–attribute–value model
- EU Open Data Portal
- History of the World Wide Web

- Hyperdata
- Internet of things
- Linked data
- List of emerging technologies
- Nextbio
- Ontology alignment
- Ontology learning
- RDF and OWL
- Semantic computing
- Semantic Geospatial Web
- Semantic heterogeneity
- Semantic integration
- Semantic matching
- Semantic MediaWiki
- Semantic Sensor Web
- Semantic social network
- Semantic technology
- *Semantic Web*
- Semantically-Interlinked Online Communities
- Smart-M3
- Social Semantic Web
- Web engineering
- Web resource
- Web science

References

[edit]

1. ^ Semantic Web at W3C: https://www.w3.org/standards/semanticweb/
2. ^ *"World Wide Web Consortium (W3C), "RDF/XML Syntax Specification (Revised)", 25 Feb. 2014".*
3. ^ *"World Wide Web Consortium (W3C), "OWL Web Ontology Language Overview", W3C Recommendation, 10 Feb. 2004".*
4. ^ *Chung, Seung-Hwa (2018). "The MOUSE approach: Mapping Ontologies using UML for System Engineers". Computer Reviews Journal: 8–29. ISSN 2581-6640.*
5. ^ ***a b*** *"W3C Semantic Web Activity". World Wide Web Consortium (W3C). November 7, 2011. Retrieved November 26, 2011.*
6. ^ *"Q&A with Tim Berners-Lee, Special Report". Bloomberg. Retrieved 14 April 2018.*
7. ^ ***a b*** *Berners-Lee, Tim; James Hendler; Ora Lassila (May 17, 2001). "The Semantic Web". Scientific American. Retrieved July 2, 2019.*
8. ^ *Lee Feigenbaum (May 1, 2007). "The Semantic Web in Action". Scientific American. Retrieved February 24, 2010.*

9. ^ *Berners-Lee, Tim; Fischetti, Mark (1999). Weaving the Web. HarperSanFrancisco. chapter 12. ISBN 978-0-06-251587-2.*
10. ^ *Berners-Lee, Tim; Hendler, James; Lassila, Ora (May 17, 2001). "The Semantic Web" (PDF). Scientific American. Vol. 284, no. 5. pp. 34–43. JSTOR 26059207. S2CID 56818714. Archived from the original (PDF) on October 10, 2017. Retrieved March 13, 2008.*
11. ^ *Nigel Shadbolt; Wendy Hall; Tim Berners-Lee (2006). "The Semantic Web Revisited" (PDF). IEEE Intelligent Systems. Archived from the original (PDF) on March 20, 2013. Retrieved April 13, 2007.*
12. ^ *Ramanathan V. Guha (2013). "Light at the End of the Tunnel". International Semantic Web Conference 2013 Keynote. Retrieved March 8, 2015.*
13. ^ *Allsopp, John (March 2007). Microformats: Empowering Your Markup for Web 2.0. Friends of ED. p. 368. ISBN 978-1-59059-814-6.*
14. ^ Artem Chebotko and Shiyong Lu, "Querying the Semantic Web: An Efficient Approach Using Relational Databases", LAP Lambert Academic Publishing, ISBN 978-3-8383-0264-5, 2009.
15. ^ *"Towards the Semantic Web: Collaborative Tag Suggestions" (PDF).*
16. ^ *Specia, Lucia; Motta, Enrico (2007). "Integrating Folksonomies with the Semantic Web". The Semantic Web: Research and Applications. Lecture Notes in Computer Science. Vol. 4519. Springer. pp. 624–639. doi:10.1007/978-3-540-72667-8_44. ISBN 978-3-540-72666-1.*
17. ^ *"Bridging the gap between folksonomies and the semantic web: an experience report" (PDF).*
18. ^ *Nicholson, Josh M.; Mordaunt, Milo; Lopez, Patrice; Uppala, Ashish; Rosati, Domenic; Rodrigues, Neves P.; Grabitz, Peter; Rife, Sean C. (5 November 2021). "scite: A smart citation index that displays the context of citations and classifies their intent using deep learning". Quantitative Science Studies. **2** (3): 882–898. doi:10.1162/qss_a_00146.*
19. ^ *Singh Chawla, Dalmeet (24 January 2022). "Massive open index of scholarly papers launches". Nature. doi:10.1038/d41586-022-00138-y. Retrieved 14 February 2022.*
20. ^ *"OpenAlex: The Promising Alternative to Microsoft Academic Graph". Singapore Management University (SMU). Retrieved 14 February 2022.*
21. ^ *"OpenAlex Documentation". Retrieved 18 February 2022.*
22. ^ *Shannon, Victoria (23 May 2006). "A 'more revolutionary' Web". International Herald Tribune. Retrieved 26 June 2006.*
23. ^ *"Web 3.0 Explained, Plus the History of Web 1.0 and 2.0". Investopedia. Retrieved 2022-10-21.*
24. ^ https://www.rsisinternational.org/IJRSI/Issue31/75-78.pdf
25. ^ Almeida, F. (2017). Concept and dimensions of web 4.0. International journal of computers and technology, 16(7).
26. ^ *"The Commission wants the EU to lead on 'Web 4.0' — whatever that is". 11 July 2023.*
27. ^ *"W3C Uncertainty Reasoning for the World Wide Web". www.w3.org. Retrieved 2021-05-14.*
28. ^ *"Uncertainty Reasoning for the World Wide Web". W3.org. Retrieved 20 December 2018.*

29. ^ *Lukasiewicz, Thomas; Umberto Straccia (2008). "Managing uncertainty and vagueness in description logics for the Semantic Web" (PDF). Web Semantics: Science, Services and Agents on the World Wide Web. **6** (4): 291–308. doi:10.1016/j.websem.2008.04.001.*
30. ^ *"Semantic Web Standards". W3.org. Retrieved 14 April 2018.*
31. ^ *"OWL Web Ontology Language Overview". World Wide Web Consortium (W3C). February 10, 2004. Retrieved November 26, 2011.*
32. ^ *"Resource Description Framework (RDF)". World Wide Web Consortium.*
33. ^ *Allemang, Dean; Hendler, James; Gandon, Fabien (August 3, 2020). Semantic Web for the Working Ontologist : Effective Modeling for Linked Data, RDFS, and OWL (Third ed.). [New York, NY, USA]: ACM Books; 3rd edition. ISBN 978-1450376143.*
34. ^ *"ConverterToRdf - W3C Wiki". W3.org. Retrieved 20 December 2018.*
35. ^ *Sikos, Leslie F. (2015). Mastering Structured Data on the Semantic Web: From HTML5 Microdata to Linked Open Data. Apress. p. 23. ISBN 978-1-4842-1049-9.*
36. ^ *Kiesel, Johannes; Lang, Kevin; Wachsmuth, Henning; Hornecker, Eva; Stein, Benno (14 March 2020). "Investigating Expectations for Voice-based and Conversational Argument Search on the Web". Proceedings of the 2020 Conference on Human Information Interaction and Retrieval. ACM. pp. 53–62. doi:10.1145/3343413.3377978. ISBN 9781450368926. S2CID 212676751.*
37. ^ *Vetere, Guido (30 June 2018). "L'impossibile necessità delle piattaforme sociali decentralizzate". DigitCult - Scientific Journal on Digital Cultures. **3** (1): 41–50. doi: 10.4399/97888255159096.*
38. ^ *Bikakis, Antonis; Flouris, Giorgos; Patkos, Theodore; Plexousakis, Dimitris (2023). "Sketching the vision of the Web of Debates". Frontiers in Artificial Intelligence. **6**. doi: 10.3389/frai.2023.1124045. ISSN 2624-8212. PMC 10313200. PMID 37396970.*
39. ^ *Schneider, Jodi; Groza, Tudor; Passant, Alexandre. "A Review of Argumentation for the Social Semantic Web" (PDF).* cite journal: Cite journal requires |journal= (help)
40. ^ *Zhang, Chuanrong; Zhao, Tian; Li, Weidong (2015). Geospatial Semantic Web. Springer International Publishing : Imprint: Springer. ISBN 978-3-319-17801-1.*
41. ^ Omar Alonso and Hugo Zaragoza. 2008. Exploiting semantic annotations in information retrieval: ESAIR '08. SIGIR Forum 42, 1 (June 2008), 55–58. doi: 10.1145/1394251.1394262
42. ^ Jaap Kamps, Jussi Karlgren, and Ralf Schenkel. 2011. Report on the third workshop on exploiting semantic annotations in information retrieval (ESAIR). SIGIR Forum 45, 1 (May 2011), 33–41. doi:10.1145/1988852.1988858
43. ^ Jaap Kamps, Jussi Karlgren, Peter Mika, and Vanessa Murdock. 2012. Fifth workshop on exploiting semantic annotations in information retrieval: ESAIR '12). In Proceedings of the 21st ACM international conference on information and knowledge management (CIKM '12). ACM, New York, NY, USA, 2772–2773. doi:10.1145/2396761.2398761
44. ^ Omar Alonso, Jaap Kamps, and Jussi Karlgren. 2015. Report on the Seventh Workshop on Exploiting Semantic Annotations in Information Retrieval (ESAIR '14). SIGIR Forum 49, 1 (June 2015), 27–34. doi:10.1145/2795403.2795412
45. ^ *Kuriakose, John (September 2009). "Understanding and Adopting Semantic Web Technology". Cutter IT Journal. **22** (9). CUTTER INFORMATION CORP.: 10–18.*

46. ^ **a b c** *Marshall, Catherine C.; Shipman, Frank M. (2003). Which semantic web? (PDF). Proc. ACM Conf. on Hypertext and Hypermedia. pp. 57–66. Archived from the original (PDF) on 2015-09-23. Retrieved 2015-04-17.*
47. ^ **a b** *Ivan Herman (2007). State of the Semantic Web (PDF). Semantic Days 2007. Retrieved July 26, 2007.*
48. ^ *Doctorow, Cory. "Metacrap: Putting the torch to seven straw-men of the meta-utopia". www.well.com/. Retrieved 11 September 2023.*
49. ^ *Gärdenfors, Peter (2004). How to make the Semantic Web more semantic. IOS Press. pp. 17–34.* cite book: |work= ignored (help)
50. ^ *Honkela, Timo; Könönen, Ville; Lindh-Knuutila, Tiina; Paukkeri, Mari-Sanna (2008). "Simulating processes of concept formation and communication". Journal of Economic Methodology. **15** (3): 245–259. doi:10.1080/13501780802321350. S2CID 16994027.*
51. ^ *"Policy Aware Web Project". Policyawareweb.org. Retrieved 2013-06-14.*
52. ^ *Corby, Olivier; Dieng-Kuntz, Rose; Zucker, Catherine Faron; Gandon, Fabien (2006). "Searching the Semantic Web: Approximate Query Processing based on Ontologies". IEEE Intelligent Systems. **21**: 20–27. doi:10.1109/MIS.2006.16. S2CID 11488848.*
53. ^ *Gandon, Fabien (7 November 2002). Distributed Artificial Intelligence And Knowledge Management: Ontologies And Multi-Agent Systems For A Corporate Semantic Web (phdthesis). Université Nice Sophia Antipolis.*
54. ^ *Buffa, Michel; Dehors, Sylvain; Faron-Zucker, Catherine; Sander, Peter (2005). "Towards a Corporate Semantic Web Approach in Designing Learning Systems: Review of the Trial Solutioins Project" (PDF). International Workshop on Applications of Semantic Web Technologies for E-Learning. Amsterdam, Holland. pp. 73–76.*
55. ^ *"Corporate Semantic Web - Home". Corporate-semantic-web.de. Retrieved 14 April 2018.*
56. ^ *Hinze, Annika; Heese, Ralf; Luczak-Rösch, Markus; Paschke, Adrian (2012). "Semantic Enrichment by Non-Experts: Usability of Manual Annotation Tools" (PDF). ISWC'12 - Proceedings of the 11th international conference on The Semantic Web. Boston, USA. pp. 165–181.*
57. ^ *Mathieson, S. A. (6 April 2006). "Spread the word, and join it up". The Guardian. Retrieved 14 April 2018.*
58. ^ *Spivack, Nova (18 September 2007). "The Semantic Web, Collective Intelligence and Hyperdata". novaspivack.typepad.com/nova_spivacks_weblog [This Blog has Moved to NovaSpivack.com]. Retrieved 14 April 2018.*

Further reading

[edit]

- *Liyang Yu (December 14, 2014). A Developer's Guide to the Semantic Web, 2nd ed. Springer. ISBN 978-3-662-43796-4.*
- Aaron Swartz's A Programmable Web: An unfinished Work donated by Morgan & Claypool Publishers after Aaron Swartz's death in January 2013.

- *Grigoris Antoniou, Frank van Harmelen (March 31, 2008). A Semantic Web Primer, 2nd Edition. The MIT Press. ISBN 978-0-262-01242-3.*
- *Allemang, Dean; Hendler, James; Gandon, Fabien (August 3, 2020). Semantic Web for the Working Ontologist : Effective Modeling for Linked Data, RDFS, and OWL (Third ed.). [New York, NY, USA]: ACM Books; 3rd edition. ISBN 978-1450376143.*
- *Pascal Hitzler; Markus Krötzsch; Sebastian Rudolph (August 25, 2009). Foundations of Semantic Web Technologies. CRCPress. ISBN 978-1-4200-9050-5.*
- *Thomas B. Passin (March 1, 2004). Explorer's Guide to the Semantic Web. Manning Publications. ISBN 978-1-932394-20-7.*
- *Jeffrey T. Pollock (March 23, 2009). Semantic Web For Dummies. For Dummies. ISBN 978-0-470-39679-7.*
- *Hitzler, Pascal (February 2021). "A Review of the Semantic Web Field". Communications of the ACM. **64** (2): 76–83. doi:10.1145/3397512.*
- *Unni, Deepak (March 2023). "FAIRification of health-related data using semantic web technologies in the Swiss Personalized Health Network". Scientific Data. **10** (1): 127. Bibcode:2023NatSD..10..127T. doi:10.1038/s41597-023-02028-y. PMC 10006404. PMID 36899064.*

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Semantic Web

Background

- Databases
- Hypertext
- Internet
- Ontologies
- Semantics
- Semantic networks
- World Wide Web

Sub-topics

- Dataspaces
- Hyperdata
- Linked data
- Rule-based systems

Applications

- Semantic analytics
- Semantic broker
- Semantic computing
- Semantic mapper
- Semantic matching
- Semantic publishing
- Semantic reasoner
- Semantic search
- Semantic service-oriented architecture
- Semantic wiki
- Solid

Related topics

- Collective intelligence
- Description logic
- Folksonomy
- Geotagging
- Information architecture
- iXBRL
- Knowledge extraction
- Knowledge management
- Knowledge representation and reasoning
- Library 2.0
- Digital library
- Digital humanities
- Metadata
- References
- Topic map
- Web 2.0
- Web engineering
- Web Science Trust

Standards	**Syntax and supporting technologies**	○ HTTP
		○ IRI
		  ○ URI
		○ RDF
		  ○ triples
		  ○ RDF/XML
		  ○ JSON-LD
		  ○ Turtle
		  ○ TriG
		  ○ Notation3
		  ○ N-Triples
		  ○ TriX (no W3C standard)
		○ RRID
		○ SPARQL
		○ XML
		○ Semantic HTML

	Schemas, ontologies and rules	○ Common Logic ○ OWL ○ RDFS ○ Rule Interchange Format ○ Semantic Web Rule Language ○ ALPS ○ SHACL
	Semantic annotation	○ eRDF ○ GRDDL ○ Microdata ○ Microformats ○ RDFa ○ SAWSDL ○ Facebook Platform
	Common vocabularies	○ DOAP ○ Dublin Core ○ FOAF ○ Schema.org ○ SIOC ○ SKOS
	Microformat vocabularies	○ hAtom ○ hCalendar ○ hCard ○ hProduct

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Emerging technologies

Fields **Information and communications**

- Ambient intelligence
  - Internet of things
- Artificial intelligence
  - Applications of artificial intelligence
  - Machine translation
  - Machine vision
  - Mobile translation
  - Progress in artificial intelligence
  - Semantic Web
  - Speech recognition
- Atomtronics
- Carbon nanotube field-effect transistor
- Cybermethodology
- Extended reality
- Fourth-generation optical discs
  - 3D optical data storage
  - Holographic data storage
- GPGPU
- Memory
  - CBRAM
  - ECRAM
  - FRAM
  - Millipede
  - MRAM
  - NRAM
  - PRAM
  - Racetrack memory
  - RRAM
  - SONOS
  - UltraRAM
- Optical computing
- RFID
  - Chipless RFID
- Software-defined radio
- Three-dimensional integrated circuit

Topics

- Automation
- Collingridge dilemma
- Differential technological development
- Disruptive innovation
- Ephemeralization
- Ethics
  - Bioethics
  - Cyberethics
  - Neuroethics
  - Robot ethics
- Exploratory engineering
- Proactionary principle
- Technological change
  - Technological unemployment
- Technological convergence
- Technological evolution
- Technological paradigm
- Technology forecasting
  - Accelerating change
  - Future-oriented technology analysis
  - Horizon scanning
  - Moore's law
  - Technological singularity
  - Technology scouting
- Technology in science fiction
- Technology readiness level
- Technology roadmap
- Transhumanism

- Image not found or type unknown **List**

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Digital humanities

- Computational archaeology
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- Computational theory of mind
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- Digital classics
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- Digital library
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- Semantic Web
- Systems theory
- Text Encoding Initiative
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About Search engine optimization

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Part of a series on

Internet marketing

- Search engine optimization
- Local search engine optimisation
- Social media marketing
- Email marketing
- Referral marketing
- Content marketing
- Native advertising

Search engine marketing

- Pay-per-click
- Cost per impression
- Search analytics
- Web analytics

Display advertising

- Ad blocking
- Contextual advertising
- Behavioral targeting

Affiliate marketing

- Cost per action
- Revenue sharing

Mobile advertising

Search engine optimization (**SEO**) is the process of improving the quality and quantity of website traffic to a website or a web page from search engines.[1][2] SEO targets unpaid search traffic (usually referred to as "organic" results) rather than direct traffic, referral traffic, social media traffic, or paid traffic.

Unpaid search engine traffic may originate from a variety of kinds of searches, including image search, video search, academic search,[3] news search, and industry-specific vertical search engines.

As an Internet marketing strategy, SEO considers how search engines work, the computer-programmed algorithms that dictate search engine results, what people search for, the actual search queries or keywords typed into search engines, and which search engines are preferred by a target audience. SEO is performed because a website will receive more visitors from a search engine when websites rank higher within a search engine results page (SERP), with the aim of either converting the visitors or building brand awareness.[4]

History

[edit]

Webmasters and content providers began optimizing websites for search engines in the mid-1990s, as the first search engines were cataloging the early Web. Initially, webmasters submitted the address of a page, or URL to the various search engines, which would send a web crawler to *crawl* that page, extract links to other pages from it, and return information found on the page to be indexed.[5]

According to a 2004 article by former industry analyst and current Google employee Danny Sullivan, the phrase "search engine optimization" probably came into use in 1997. Sullivan credits SEO practitioner Bruce Clay as one of the first people to popularize the term.[6]

Early versions of search algorithms relied on webmaster-provided information such as the keyword meta tag or index files in engines like ALIWEB. Meta tags provide a guide to each page's content. Using metadata to index pages was found to be less than reliable, however, because the webmaster's choice of keywords in the meta tag could potentially be an inaccurate representation of the site's actual content. Flawed data in meta tags, such as those that were inaccurate or incomplete, created the potential for pages to be mischaracterized in irrelevant searches.[7][*dubious* – *discuss*] Web content providers also manipulated attributes within the HTML source of a page in an attempt to rank well in search engines.[8] By 1997, search engine designers recognized that webmasters were making efforts to rank in search engines and that some webmasters were manipulating their rankings in search results by stuffing pages with excessive or irrelevant keywords. Early search engines, such as Altavista and Infoseek, adjusted their algorithms to prevent webmasters from manipulating rankings.[9]

By heavily relying on factors such as keyword density, which were exclusively within a webmaster's control, early search engines suffered from abuse and ranking manipulation. To provide better results to their users, search engines had to adapt to ensure their results pages showed the most relevant search results, rather than unrelated pages stuffed with numerous keywords by unscrupulous webmasters. This meant moving away from heavy reliance on term density to a more holistic process for scoring semantic signals.[10]

Search engines responded by developing more complex ranking algorithms, taking into account additional factors that were more difficult for webmasters to manipulate.[*citation needed*]

Some search engines have also reached out to the SEO industry and are frequent sponsors and guests at SEO conferences, webchats, and seminars. Major search engines provide information and guidelines to help with website optimization.[11][12] Google has a Sitemaps program to help webmasters learn if Google is having any problems indexing their website and also provides data on Google traffic to the website.[13] Bing Webmaster Tools provides a way for webmasters to submit a sitemap and web feeds, allows users to determine the "crawl rate", and track the web pages index status.

In 2015, it was reported that Google was developing and promoting mobile search as a key feature within future products. In response, many brands began to take a different approach to their Internet marketing strategies.[14]

Relationship with Google

[edit]

In 1998, two graduate students at Stanford University, Larry Page and Sergey Brin, developed "Backrub", a search engine that relied on a mathematical algorithm to rate the prominence of web pages. The number calculated by the algorithm, PageRank, is a function of the quantity and strength of inbound links.[15] PageRank estimates the likelihood that a given page will be reached by a web user who randomly surfs the web and follows links from one page to

another. In effect, this means that some links are stronger than others, as a higher PageRank page is more likely to be reached by the random web surfer.

Page and Brin founded Google in 1998.[16] Google attracted a loyal following among the growing number of Internet users, who liked its simple design.[17] Off-page factors (such as PageRank and hyperlink analysis) were considered as well as on-page factors (such as keyword frequency, meta tags, headings, links and site structure) to enable Google to avoid the kind of manipulation seen in search engines that only considered on-page factors for their rankings. Although PageRank was more difficult to game, webmasters had already developed link-building tools and schemes to influence the Inktomi search engine, and these methods proved similarly applicable to gaming PageRank. Many sites focus on exchanging, buying, and selling links, often on a massive scale. Some of these schemes involved the creation of thousands of sites for the sole purpose of link spamming.[18]

By 2004, search engines had incorporated a wide range of undisclosed factors in their ranking algorithms to reduce the impact of link manipulation.[19] The leading search engines, Google, Bing, and Yahoo, do not disclose the algorithms they use to rank pages. Some SEO practitioners have studied different approaches to search engine optimization and have shared their personal opinions.[20] Patents related to search engines can provide information to better understand search engines.[21] In 2005, Google began personalizing search results for each user. Depending on their history of previous searches, Google crafted results for logged in users.[22]

In 2007, Google announced a campaign against paid links that transfer PageRank.[23] On June 15, 2009, Google disclosed that they had taken measures to mitigate the effects of PageRank sculpting by use of the nofollow attribute on links. Matt Cutts, a well-known software engineer at Google, announced that Google Bot would no longer treat any no follow links, in the same way, to prevent SEO service providers from using nofollow for PageRank sculpting.[24] As a result of this change, the usage of nofollow led to evaporation of PageRank. In order to avoid the above, SEO engineers developed alternative techniques that replace nofollowed tags with obfuscated JavaScript and thus permit PageRank sculpting. Additionally, several solutions have been suggested that include the usage of iframes, Flash, and JavaScript.[25]

In December 2009, Google announced it would be using the web search history of all its users in order to populate search results.[26] On June 8, 2010 a new web indexing system called Google Caffeine was announced. Designed to allow users to find news results, forum posts, and other content much sooner after publishing than before, Google Caffeine was a change to the way Google updated its index in order to make things show up quicker on Google than before. According to Carrie Grimes, the software engineer who announced Caffeine for Google, "Caffeine provides 50 percent fresher results for web searches than our last index..."[27] Google Instant, real-time-search, was introduced in late 2010 in an attempt to make search results more timely and relevant. Historically site administrators have spent months or even years optimizing a website to increase search rankings. With the growth in popularity of social media sites and blogs, the leading engines made changes to their algorithms to allow fresh content to rank quickly within the search results.[28]

In February 2011, Google announced the Panda update, which penalizes websites containing content duplicated from other websites and sources. Historically websites have copied content from one another and benefited in search engine rankings by engaging in this practice. However, Google implemented a new system that punishes sites whose content is not unique.[29] The 2012 Google Penguin attempted to penalize websites that used manipulative techniques to improve their rankings on the search engine.[30] Although Google Penguin has been presented as an algorithm aimed at fighting web spam, it really focuses on spammy links[31] by gauging the quality of the sites the links are coming from. The 2013 Google Hummingbird update featured an algorithm change designed to improve Google's natural language processing and semantic understanding of web pages. Hummingbird's language processing system falls under the newly recognized term of "conversational search", where the system pays more attention to each word in the query in order to better match the pages to the meaning of the query rather than a few words.[32] With regards to the changes made to search engine optimization, for content publishers and writers, Hummingbird is intended to resolve issues by getting rid of irrelevant content and spam, allowing Google to produce high-quality content and rely on them to be 'trusted' authors.

In October 2019, Google announced they would start applying BERT models for English language search queries in the US. Bidirectional Encoder Representations from Transformers (BERT) was another attempt by Google to improve their natural language processing, but this time in order to better understand the search queries of their users.[33] In terms of search engine optimization, BERT intended to connect users more easily to relevant content and increase the quality of traffic coming to websites that are ranking in the Search Engine Results Page.

Methods

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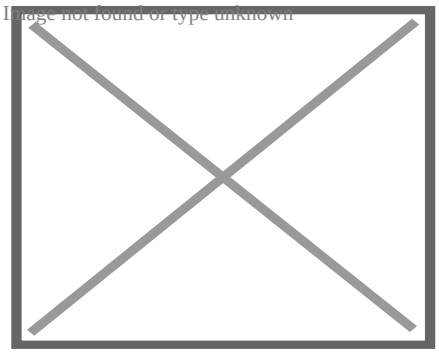
Getting indexed

[edit]



A simple illustration of the Pagerank algorithm. Percentage shows the perceived importance.

The leading search engines, such as Google, Bing, and Yahoo!, use crawlers to find pages for their algorithmic search results. Pages that are linked from other search engine-indexed pages do not need to be submitted because they are found automatically. The Yahoo! Directory and DMOZ, two major directories which closed in 2014 and 2017 respectively, both required manual submission and human editorial review.[34] Google offers Google Search Console, for which an XML Sitemap feed can be created and submitted for free to ensure that all pages are found, especially pages that are not discoverable by automatically following links[35] in addition to their URL submission console.[36] Yahoo! formerly operated a paid submission service that guaranteed to crawl for a cost per click;[37] however, this practice was discontinued in 2009.

Search engine crawlers may look at a number of different factors when crawling a site. Not every page is indexed by search engines. The distance of pages from the root directory of a site may also be a factor in whether or not pages get crawled.[38]

Mobile devices are used for the majority of Google searches.[39] In November 2016, Google announced a major change to the way they are crawling websites and started to make their index mobile-first, which means the mobile version of a given website becomes the starting point for what Google includes in their index.[40] In May 2019, Google updated the rendering engine of their crawler to be the latest version of Chromium (74 at the time of the announcement). Google indicated that they would regularly update the Chromium rendering engine to the latest version.[41] In December 2019, Google began updating the User-Agent string of their crawler to reflect the latest Chrome version used by their rendering service. The delay was to allow webmasters time to update their code that responded to particular bot User-Agent strings. Google ran evaluations and felt confident the impact would be minor.[42]

Preventing crawling

[edit]
Main article: Robots exclusion standard

To avoid undesirable content in the search indexes, webmasters can instruct spiders not to crawl certain files or directories through the standard robots.txt file in the root directory of the domain. Additionally, a page can be explicitly excluded from a search engine's database by using a meta tag specific to robots (usually <meta name="robots" content="noindex">). When a search engine visits a site, the robots.txt located in the root directory is the first file crawled. The robots.txt file is then parsed and will instruct the robot as to which pages are not to be crawled. As a search engine crawler may keep a cached copy of this file, it may on occasion crawl pages a webmaster does not wish to crawl. Pages typically prevented from being crawled include login-specific pages such as shopping carts and user-specific content such as search results from internal searches. In March 2007, Google warned webmasters that they should prevent indexing of internal search results because those pages are considered search spam.[43]

In 2020, Google sunsetted the standard (and open-sourced their code) and now treats it as a hint rather than a directive. To adequately ensure that pages are not indexed, a page-level robot's meta tag should be included.[44]

Increasing prominence

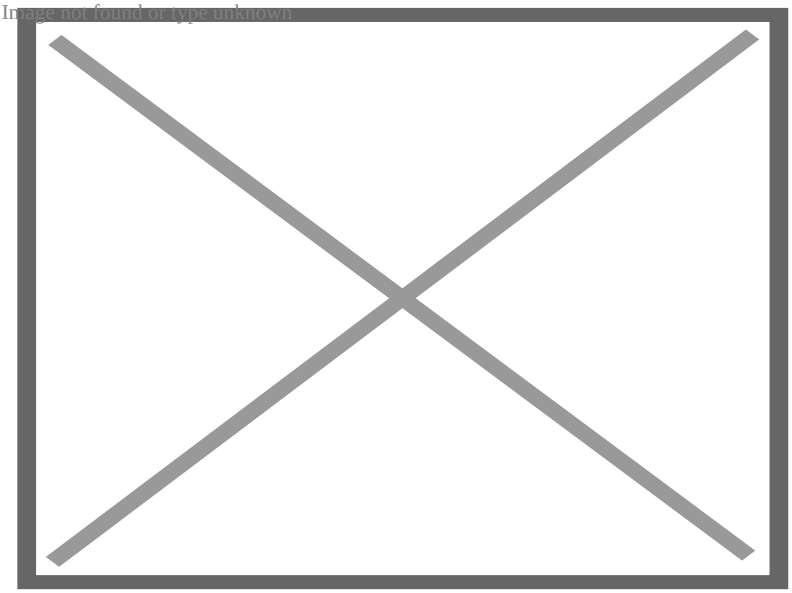
[edit]

A variety of methods can increase the prominence of a webpage within the search results. Cross linking between pages of the same website to provide more links to important pages may improve its visibility. Page design makes users trust a site and want to stay once they find it. When people bounce off a site, it counts against the site and affects its credibility.[45]

Writing content that includes frequently searched keyword phrases so as to be relevant to a wide variety of search queries will tend to increase traffic. Updating content so as to keep search engines crawling back frequently can give additional weight to a site. Adding relevant keywords to a web page's metadata, including the title tag and meta description, will tend to improve the relevancy of a site's search listings, thus increasing traffic. URL canonicalization of web pages accessible via multiple URLs, using the canonical link element[46] or via 301 redirects can help make sure links to different versions of the URL all count towards the page's link popularity score. These are known as incoming links, which point to the URL and can count towards the page link's popularity score, impacting the credibility of a website.[45]

White hat versus black hat techniques

[edit]



Common white-hat methods of search engine optimization

SEO techniques can be classified into two broad categories: techniques that search engine companies recommend as part of good design ("white hat"), and those techniques of which search engines do not approve ("black hat"). Search engines attempt to minimize the effect of the latter, among them spamdexing. Industry commentators have classified these methods and the practitioners who employ them as either white hat SEO or black hat SEO.[47] White hats tend to produce results that last a long time, whereas black hats anticipate that their sites may eventually be banned either temporarily or permanently once the search engines discover what they are doing.[48]

An SEO technique is considered a white hat if it conforms to the search engines' guidelines and involves no deception. As the search engine guidelines[11][12][49] are not written as a series of rules or commandments, this is an important distinction to note. White hat SEO is not just about following guidelines but is about ensuring that the content a search engine indexes and subsequently ranks is the same content a user will see. White hat advice is generally summed up as creating content for users, not for search engines, and then making that content easily accessible to the online "spider" algorithms, rather than attempting to trick the algorithm from its intended purpose. White hat SEO is in many ways similar to web development that promotes accessibility,[50] although the two are not identical.

Black hat SEO attempts to improve rankings in ways that are disapproved of by the search engines or involve deception. One black hat technique uses hidden text, either as text colored similar to the background, in an invisible div, or positioned off-screen. Another method gives a different page depending on whether the page is being requested by a human visitor or a search engine, a technique known as cloaking. Another category sometimes used is grey hat SEO. This is in between the black hat and white hat approaches, where the methods employed avoid the site being penalized but do not act in producing the best content for users. Grey hat SEO is entirely focused on improving search engine rankings.

Search engines may penalize sites they discover using black or grey hat methods, either by reducing their rankings or eliminating their listings from their databases altogether. Such penalties can be applied either automatically by the search engines' algorithms or by a manual site review. One example was the February 2006 Google removal of both BMW Germany and Ricoh Germany for the use of deceptive practices.[51] Both companies subsequently apologized, fixed the offending pages, and were restored to Google's search engine results page.[52]

Companies that employ black hat techniques or other spammy tactics can get their client websites banned from the search results. In 2005, the *Wall Street Journal* reported on a company, Traffic Power, which allegedly used high-risk techniques and failed to disclose those risks to its clients.[53] *Wired* magazine reported that the same company sued blogger and SEO Aaron Wall for writing about the ban.[54] Google's Matt Cutts later confirmed that Google had banned Traffic Power and some of its clients.[55]

As marketing strategy

[edit]

SEO is not an appropriate strategy for every website, and other Internet marketing strategies can be more effective, such as paid advertising through pay-per-click (PPC) campaigns, depending on the site operator's goals.[*editorializing*] Search engine marketing (SEM) is the practice of designing, running, and optimizing search engine ad campaigns. Its difference from SEO is most simply depicted as the difference between paid and unpaid priority ranking in search results. SEM focuses on prominence more so than relevance; website developers should regard SEM with the utmost importance with consideration to visibility as most navigate to the primary listings of their search.[56] A successful Internet marketing campaign may also depend upon building high-quality web pages to engage and persuade internet users, setting up analytics programs to enable site owners to measure results, and improving a site's conversion rate.[57][58] In November 2015, Google released a full 160-page version of its Search Quality Rating Guidelines to the public,[59] which revealed a shift in their focus towards "usefulness" and mobile local search. In recent years the mobile market has exploded, overtaking the use of desktops, as shown in by StatCounter in October 2016, where they analyzed 2.5 million websites and found that 51.3% of the pages were loaded by a mobile device.[60] Google has been one of the companies that are utilizing the popularity of mobile usage by encouraging websites to use their Google Search Console, the Mobile-Friendly Test, which allows companies to measure up their website to the search engine results and determine how user-friendly their websites are. The closer the keywords are together their ranking will improve based on key terms.[45]

SEO may generate an adequate return on investment. However, search engines are not paid for organic search traffic, their algorithms change, and there are no guarantees of continued referrals. Due to this lack of guarantee and uncertainty, a business that relies heavily on search engine traffic can suffer major losses if the search engines stop sending visitors.[61] Search engines can change their algorithms, impacting a website's search engine ranking, possibly resulting in a serious loss of traffic. According to Google's CEO, Eric Schmidt, in 2010, Google made over 500 algorithm changes – almost 1.5 per day.[62] It is considered a wise business practice for website operators to liberate themselves from dependence on search engine traffic.[63] In addition to accessibility in terms of web crawlers (addressed above), user web accessibility has become increasingly important for SEO.

International markets and SEO

[edit]

Optimization techniques are highly tuned to the dominant search engines in the target market. The search engines' market shares vary from market to market, as does competition. In 2003, Danny Sullivan stated that Google represented about 75% of all searches.[64] In markets outside the United States, Google's share is often larger, and data showed Google was the

dominant search engine worldwide as of 2007.[65] As of 2006, Google had an 85–90% market share in Germany.[66] While there were hundreds of SEO firms in the US at that time, there were only about five in Germany.[66] As of March 2024, Google still had a significant market share of 89.85% in Germany.[67] As of June 2008, the market share of Google in the UK was close to 90% according to Hitwise.[68][*obsolete source*] As of March 2024, Google's market share in the UK was 93.61%.[69]

Successful search engine optimization (SEO) for international markets requires more than just translating web pages. It may also involve registering a domain name with a country-code top-level domain (ccTLD) or a relevant top-level domain (TLD) for the target market, choosing web hosting with a local IP address or server, and using a Content Delivery Network (CDN) to improve website speed and performance globally. It is also important to understand the local culture so that the content feels relevant to the audience. This includes conducting keyword research for each market, using hreflang tags to target the right languages, and building local backlinks. However, the core SEO principles—such as creating high-quality content, improving user experience, and building links—remain the same, regardless of language or region.[66]

Regional search engines have a strong presence in specific markets:

- China: Baidu leads the market, controlling about 70 to 80% market share.[70]
- South Korea: Since the end of 2021, Naver, a domestic web portal, has gained prominence in the country.[71][72]
- Russia: Yandex is the leading search engine in Russia. As of December 2023, it accounted for at least 63.8% of the market share.[73]

The Evolution of International SEO

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By the early 2000s, businesses recognized that the web and search engines could help them reach global audiences. As a result, the need for multilingual SEO emerged.[74] In the early years of international SEO development, simple translation was seen as sufficient. However, over time, it became clear that localization and transcreation—adapting content to local language, culture, and emotional resonance—were far more effective than basic translation.[75]

Legal precedents

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On October 17, 2002, SearchKing filed suit in the United States District Court, Western District of Oklahoma, against the search engine Google. SearchKing's claim was that Google's tactics to prevent spamdexing constituted a tortious interference with contractual relations. On May 27, 2003, the court granted Google's motion to dismiss the complaint because SearchKing

"failed to state a claim upon which relief may be granted."[76][77]

In March 2006, KinderStart filed a lawsuit against Google over search engine rankings. KinderStart's website was removed from Google's index prior to the lawsuit, and the amount of traffic to the site dropped by 70%. On March 16, 2007, the United States District Court for the Northern District of California (San Jose Division) dismissed KinderStart's complaint without leave to amend and partially granted Google's motion for Rule 11 sanctions against KinderStart's attorney, requiring him to pay part of Google's legal expenses.[78][79]

See also

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- Competitor backlinking
- List of search engines
- Search engine marketing
- Search neutrality, the opposite of search manipulation
- User intent
- Website promotion
- Search engine results page
- Search engine scraping

References

[edit]

1. ^ *"SEO – search engine optimization". Webopedia. December 19, 2001. Archived from the original on May 9, 2019. Retrieved May 9, 2019.*
2. ^ *Giomelakis, Dimitrios; Veglis, Andreas (April 2, 2016). "Investigating Search Engine Optimization Factors in Media Websites: The case of Greece". Digital Journalism. **4** (3): 379–400. doi:10.1080/21670811.2015.1046992. ISSN 2167-0811. S2CID 166902013. Archived from the original on October 30, 2022. Retrieved October 30, 2022.*
3. ^ *Beel, Jöran; Gipp, Bela; Wilde, Erik (2010). "Academic Search Engine Optimization (ASEO): Optimizing Scholarly Literature for Google Scholar and Co" (PDF). Journal of Scholarly Publishing. pp. 176–190. Archived from the original (PDF) on November 18, 2017. Retrieved April 18, 2010.*
4. ^ Ortiz-Cordova, A. and Jansen, B. J. (2012) Classifying Web Search Queries in Order to Identify High Revenue Generating Customers. Archived March 4, 2016, at the Wayback Machine. Journal of the American Society for Information Sciences and Technology. 63(7), 1426 – 1441.
5. ^ *Brian Pinkerton. "Finding What People Want: Experiences with the WebCrawler" (PDF). The Second International WWW Conference Chicago, USA, October 17–20, 1994. Archived (PDF) from the original on May 8, 2007. Retrieved May 7, 2007.*

6. ^ Danny Sullivan (June 14, 2004). "Who Invented the Term "Search Engine Optimization"?". Search Engine Watch. Archived from the original on April 23, 2010. Retrieved May 14, 2007. See Google groups thread Archived June 17, 2013, at the Wayback Machine.
7. ^ "The Challenge is Open", Brain vs Computer, WORLD SCIENTIFIC, November 17, 2020, pp. 189–211, doi:10.1142/9789811225017_0009, ISBN 978-981-12-2500-0, S2CID 243130517
8. ^ Pringle, G.; Allison, L.; Dowe, D. (April 1998). "What is a tall poppy among web pages?" . Monash University. Archived from the original on April 27, 2007. Retrieved May 8, 2007.
9. ^ Laurie J. Flynn (November 11, 1996). "Desperately Seeking Surfers". New York Times. Archived from the original on October 30, 2007. Retrieved May 9, 2007.
10. ^ Jason Demers (January 20, 2016). "Is Keyword Density Still Important for SEO". Forbes . Archived from the original on August 16, 2016. Retrieved August 15, 2016.
11. ^ **a b** "Google's Guidelines on Site Design". Archived from the original on January 9, 2009 . Retrieved April 18, 2007.
12. ^ **a b** "Bing Webmaster Guidelines". bing.com. Archived from the original on September 9, 2014. Retrieved September 11, 2014.
13. ^ "Sitemaps". Archived from the original on June 22, 2023. Retrieved July 4, 2012.
14. ^ ""By the Data: For Consumers, Mobile is the Internet" Google for Entrepreneurs Startup Grind September 20, 2015". Archived from the original on January 6, 2016. Retrieved January 8, 2016.
15. ^ Brin, Sergey & Page, Larry (1998). "The Anatomy of a Large-Scale Hypertextual Web Search Engine". Proceedings of the seventh international conference on World Wide Web. pp. 107–117. Archived from the original on October 10, 2006. Retrieved May 8, 2007.
16. ^ "Co-founders of Google - Google's co-founders may not have the name recognition of say, Bill Gates, but give them time: Google hasn't been around nearly as long as Microsoft". Entrepreneur. October 15, 2008. Archived from the original on May 31, 2014. Retrieved May 30, 2014.
17. ^ Thompson, Bill (December 19, 2003). "Is Google good for you?". BBC News. Archived from the original on January 25, 2009. Retrieved May 16, 2007.
18. ^ Zoltan Gyongyi & Hector Garcia-Molina (2005). "Link Spam Alliances" (PDF). Proceedings of the 31st VLDB Conference, Trondheim, Norway. Archived (PDF) from the original on June 12, 2007. Retrieved May 9, 2007.
19. ^ Hansell, Saul (June 3, 2007). "Google Keeps Tweaking Its Search Engine". New York Times. Archived from the original on November 10, 2017. Retrieved June 6, 2007.
20. ^ Sullivan, Danny (September 29, 2005). "Rundown On Search Ranking Factors". Search Engine Watch. Archived from the original on May 28, 2007. Retrieved May 8, 2007.
21. ^ Christine Churchill (November 23, 2005). "Understanding Search Engine Patents". Search Engine Watch. Archived from the original on February 7, 2007. Retrieved May 8, 2007.
22. ^ "Google Personalized Search Leaves Google Labs". searchenginewatch.com. Search Engine Watch. Archived from the original on January 25, 2009. Retrieved September 5, 2009.

23. ^ "8 Things We Learned About Google PageRank". www.searchenginejournal.com. October 25, 2007. Archived from the original on August 19, 2009. Retrieved August 17, 2009.
24. ^ "PageRank sculpting". Matt Cutts. Archived from the original on January 6, 2010. Retrieved January 12, 2010.
25. ^ "Google Loses "Backwards Compatibility" On Paid Link Blocking & PageRank Sculpting". searchengineland.com. June 3, 2009. Archived from the original on August 14, 2009. Retrieved August 17, 2009.
26. ^ "Personalized Search for everyone". Archived from the original on December 8, 2009. Retrieved December 14, 2009.
27. ^ "Our new search index: Caffeine". Google: Official Blog. Archived from the original on June 18, 2010. Retrieved May 10, 2014.
28. ^ "Relevance Meets Real-Time Web". Google Blog. Archived from the original on April 7, 2019. Retrieved January 4, 2010.
29. ^ "Google Search Quality Updates". Google Blog. Archived from the original on April 23, 2022. Retrieved March 21, 2012.
30. ^ "What You Need to Know About Google's Penguin Update". Inc.com. June 20, 2012. Archived from the original on December 20, 2012. Retrieved December 6, 2012.
31. ^ "Google Penguin looks mostly at your link source, says Google". Search Engine Land. October 10, 2016. Archived from the original on April 21, 2017. Retrieved April 20, 2017.
32. ^ "FAQ: All About The New Google "Hummingbird" Algorithm". www.searchengineland.com. September 26, 2013. Archived from the original on December 23, 2018. Retrieved March 17, 2018.
33. ^ "Understanding searches better than ever before". Google. October 25, 2019. Archived from the original on January 27, 2021. Retrieved May 12, 2020.
34. ^ "Submitting To Directories: Yahoo & The Open Directory". Search Engine Watch. March 12, 2007. Archived from the original on May 19, 2007. Retrieved May 15, 2007.
35. ^ "What is a Sitemap file and why should I have one?". Archived from the original on July 1, 2007. Retrieved March 19, 2007.
36. ^ "Search Console - Crawl URL". Archived from the original on August 14, 2022. Retrieved December 18, 2015.
37. ^ Sullivan, Danny (March 12, 2007). "Submitting To Search Crawlers: Google, Yahoo, Ask & Microsoft's Live Search". Search Engine Watch. Archived from the original on May 10, 2007. Retrieved May 15, 2007.
38. ^ Cho, J.; Garcia-Molina, H.; Page, L. (1998). "Efficient crawling through URL ordering". Seventh International World-Wide Web Conference. Brisbane, Australia: Stanford InfoLab Publication Server. Archived from the original on July 14, 2019. Retrieved May 9, 2007.
39. ^ "Mobile-first Index". Archived from the original on February 22, 2019. Retrieved March 19, 2018.
40. ^ Phan, Doantam (November 4, 2016). "Mobile-first Indexing". Official Google Webmaster Central Blog. Archived from the original on February 22, 2019. Retrieved January 16, 2019.
41. ^ "The new evergreen Googlebot". Official Google Webmaster Central Blog. Archived from the original on November 6, 2020. Retrieved March 2, 2020.

42. ^ "Updating the user agent of Googlebot". Official Google Webmaster Central Blog. Archived from the original on March 2, 2020. Retrieved March 2, 2020.
43. ^ "Newspapers Amok! New York Times Spamming Google? LA Times Hijacking Cars.com?". Search Engine Land. May 8, 2007. Archived from the original on December 26, 2008. Retrieved May 9, 2007.
44. ^ Jill Kocher Brown (February 24, 2020). "Google Downgrades Nofollow Directive. Now What?". Practical Ecommerce. Archived from the original on January 25, 2021. Retrieved February 11, 2021.
45. ^ **a b c** Morey, Sean (2008). The Digital Writer. Fountainhead Press. pp. 171–187.
46. ^ "Bing – Partnering to help solve duplicate content issues – Webmaster Blog – Bing Community". www.bing.com. February 12, 2009. Archived from the original on June 7, 2014. Retrieved October 30, 2009.
47. ^ Andrew Goodman. "Search Engine Showdown: Black hats vs. White hats at SES". SearchEngineWatch. Archived from the original on February 22, 2007. Retrieved May 9, 2007.
48. ^ Jill Whalen (November 16, 2004). "Black Hat/White Hat Search Engine Optimization". searchengineguide.com. Archived from the original on November 17, 2004. Retrieved May 9, 2007.
49. ^ "What's an SEO? Does Google recommend working with companies that offer to make my site Google-friendly?". Archived from the original on April 16, 2006. Retrieved April 18, 2007.
50. ^ Andy Hagans (November 8, 2005). "High Accessibility Is Effective Search Engine Optimization". A List Apart. Archived from the original on May 4, 2007. Retrieved May 9, 2007.
51. ^ Matt Cutts (February 4, 2006). "Ramping up on international webspam". mattcutts.com/blog. Archived from the original on June 29, 2012. Retrieved May 9, 2007.
52. ^ Matt Cutts (February 7, 2006). "Recent reinclusions". mattcutts.com/blog. Archived from the original on May 22, 2007. Retrieved May 9, 2007.
53. ^ David Kesmodel (September 22, 2005). "Sites Get Dropped by Search Engines After Trying to 'Optimize' Rankings". Wall Street Journal. Archived from the original on August 4, 2020. Retrieved July 30, 2008.
54. ^ Adam L. Penenberg (September 8, 2005). "Legal Showdown in Search Fracas". Wired Magazine. Archived from the original on March 4, 2016. Retrieved August 11, 2016.
55. ^ Matt Cutts (February 2, 2006). "Confirming a penalty". mattcutts.com/blog. Archived from the original on June 26, 2012. Retrieved May 9, 2007.
56. ^ Tapan, Panda (2013). "Search Engine Marketing: Does the Knowledge Discovery Process Help Online Retailers?". IUP Journal of Knowledge Management. **11** (3): 56–66. ProQuest 1430517207.
57. ^ Melissa Burdon (March 13, 2007). "The Battle Between Search Engine Optimization and Conversion: Who Wins?". Grok.com. Archived from the original on March 15, 2008. Retrieved April 10, 2017.
58. ^ "SEO Tips and Marketing Strategies". Archived from the original on October 30, 2022. Retrieved October 30, 2022.

59. ^ ""Search Quality Evaluator Guidelines" How Search Works November 12, 2015" (PDF). Archived (PDF) from the original on March 29, 2019. Retrieved January 11, 2016.
60. ^ Titcomb, James (November 2016). "Mobile web usage overtakes desktop for first time". The Telegraph. Archived from the original on January 10, 2022. Retrieved March 17, 2018.
61. ^ Andy Greenberg (April 30, 2007). "Condemned To Google Hell". Forbes. Archived from the original on May 2, 2007. Retrieved May 9, 2007.
62. ^ Matt McGee (September 21, 2011). "Schmidt's testimony reveals how Google tests algorithm changes". Archived from the original on January 17, 2012. Retrieved January 4, 2012.
63. ^ Jakob Nielsen (January 9, 2006). "Search Engines as Leeches on the Web". useit.com. Archived from the original on August 25, 2012. Retrieved May 14, 2007.
64. ^ Graham, Jefferson (August 26, 2003). "The search engine that could". USA Today. Archived from the original on May 17, 2007. Retrieved May 15, 2007.
65. ^ Greg Jarboe (February 22, 2007). "Stats Show Google Dominates the International Search Landscape". Search Engine Watch. Archived from the original on May 23, 2011. Retrieved May 15, 2007.
66. ^ **a b c** Mike Grehan (April 3, 2006). "Search Engine Optimizing for Europe". Click. Archived from the original on November 6, 2010. Retrieved May 14, 2007.
67. ^ "Germany search engine market share 2024". Statista. Retrieved January 6, 2025.
68. ^ Jack Schofield (June 10, 2008). "Google UK closes in on 90% market share". Guardian. London. Archived from the original on December 17, 2013. Retrieved June 10, 2008.
69. ^ "UK search engines market share 2024". Statista. Retrieved January 6, 2025.
70. ^ "China search engines market share 2024". Statista. Retrieved January 6, 2025.
71. ^ cycles, This text provides general information Statista assumes no liability for the information given being complete or correct Due to varying update; Text, Statistics Can Display More up-to-Date Data Than Referenced in the. "Topic: Search engines in South Korea". Statista. Retrieved January 6, 2025.
72. ^ "South Korea: main service used to search for information 2024". Statista. Retrieved January 6, 2025.
73. ^ "Most popular search engines in Russia 2023". Statista. Retrieved January 6, 2025.
74. ^ Arora, Sanjog; Hemrajani, Naveen (September 2023). "A REVIEW ON: MULTILINGUAL SEARCH TECHNIQUE". International Journal of Applied Engineering & Technology. **5** (3): 760–770 – via ResearchGate.
75. ^ "SEO Starter Guide: The Basics | Google Search Central | Documentation". Google for Developers. Retrieved January 13, 2025.
76. ^ "Search King, Inc. v. Google Technology, Inc., CIV-02-1457-M" (PDF). docstoc.com. May 27, 2003. Archived from the original on May 27, 2008. Retrieved May 23, 2008.
77. ^ Stefanie Olsen (May 30, 2003). "Judge dismisses suit against Google". CNET. Archived from the original on December 1, 2010. Retrieved May 10, 2007.
78. ^ "Technology & Marketing Law Blog: KinderStart v. Google Dismissed—With Sanctions Against KinderStart's Counsel". blog.ericgoldman.org. March 20, 2007. Archived from the original on May 11, 2008. Retrieved June 23, 2008.

79. ^ *"Technology & Marketing Law Blog: Google Sued Over Rankings—KinderStart.com v. Google". blog.ericgoldman.org. Archived from the original on June 22, 2008. Retrieved June 23, 2008.*

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Search engine optimization

Exclusion standards	○ Robots exclusion standard ○ Meta element ○ nofollow
Marketing topics	○ Online advertising ○ Email marketing ○ Display advertising ○ Web analytics

Search marketing	○ Search engine marketing ○ Social media optimization ○ Online identity management ○ Paid inclusion ○ Pay per click ○ Google bomb
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Linking	○ Backlink ○ Link building ○ Link exchange ○ Organic linking
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About Web syndication

Web syndication is making content available from one website to other sites. Most commonly, websites are made available to provide either summaries or full renditions of a website's recently added content. The term may also describe other kinds of content licensing for reuse.

Motivation

[edit]

For the subscribing sites, syndication is an effective way of adding greater depth and immediacy of information to their pages, making them more attractive to users. For the provider site, syndication increases exposure. This generates new traffic for the provider site—making syndication an easy and relatively cheap, or even free, form of advertisement.

Content syndication has become an effective strategy for link building, as search engine optimization has become an increasingly important topic among website owners and online marketers. Links embedded within the syndicated content are typically optimized around anchor terms that will point an optimized [*clarification needed*] link back to the website that the content author is trying to promote. These links tell the algorithms of the search engines that the website being linked to is an authority for the keyword that is being used as the anchor text. However the rollout of Google Panda's algorithm may not reflect this authority in its SERP rankings based on quality scores generated by the sites linking to the authority.

The prevalence of web syndication is also of note to online marketers, since web surfers are becoming increasingly wary of providing personal information for marketing materials (such as signing up for a newsletter) and expect the ability to subscribe to a feed instead. Although the format could be anything transported over HTTP, such as HTML or JavaScript, it is more commonly XML. Web syndication formats include RSS, Atom,[1] and JSON Feed.

History

[edit]
Main article: History of web syndication technology

Syndication first arose in earlier media such as print, radio, and television, allowing content creators to reach a wider audience. In the case of radio, the United States Federal government proposed a syndicate in 1924 so that the country's executives could quickly and efficiently reach the entire population.[2] In the case of television, it is often said that "Syndication is where the real money is."[3] Additionally, syndication accounts for the bulk of TV programming.[4]

One predecessor of web syndication is the Meta Content Framework (MCF), developed in 1996 by Ramanathan V. Guha and others in Apple Computer's Advanced Technology Group.[5]

Today, millions of online publishers, including newspapers, commercial websites, and blogs, distribute their news headlines, product offers, and blog postings in the news feed.

As a commercial model

[edit]

Conventional syndication businesses such as Reuters and Associated Press thrive on the internet by offering their content to media partners on a subscription basis,[6] using business models established in earlier media forms.

Commercial web syndication can be categorized in three ways:

- by *business models*
- by *types of content*
- by *methods for selecting distribution partners*

Commercial web syndication involves partnerships between content producers and distribution outlets. There are different structures of partnership agreements. One such structure is licensing content, in which distribution partners pay a fee to the content creators for the right to publish the content. Another structure is ad-supported content, in which publishers share revenues derived from advertising on syndicated content with that content's producer. A third structure is free, or barter syndication, in which no currency changes hands between publishers and content producers. This requires the content producers to generate revenue from another source, such as embedded advertising or subscriptions. Alternatively, they could distribute content without remuneration. Typically, those who create and distribute content free are promotional entities, vanity publishers, or government entities.

Types of content syndicated include RSS or Atom Feeds and full content. With RSS feeds, headlines, summaries, and sometimes a modified version of the original full content is displayed on users' feed readers. With full content, the entire content—which might be text, audio, video, applications/widgets, or user-generated content—appears unaltered on the publisher's site.

There are two methods for selecting distribution partners. The content creator can hand-pick syndication partners based on specific criteria, such as the size or quality of their audiences. Alternatively, the content creator can allow publisher sites or users to opt into carrying the content through an automated system. Some of these automated "content marketplace" systems involve careful screening of potential publishers by the content creator to ensure that the material does not end up in an inappropriate environment.

Just as syndication is a source of profit for TV producers and radio producers, it also functions to maximize profit for Internet content producers. As the Internet has increased in size[7] it has become increasingly difficult for content producers to aggregate a sufficiently large audience to support the creation of high-quality content. Syndication enables content creators to amortize

the cost of producing content by licensing it across multiple publishers or by maximizing the distribution of advertising-supported content. A potential drawback for content creators, however, is that they can lose control over the presentation of their content when they syndicate it to other parties.

Distribution partners benefit by receiving content either at a discounted price, or free. One potential drawback for publishers, however, is that because the content is duplicated at other publisher sites, they cannot have an "exclusive" on the content.

For users, the fact that syndication enables the production and maintenance of content allows them to find and consume content on the Internet. One potential drawback for them is that they may run into duplicate content, which could be an annoyance.

E-commerce

[edit]
See also: E-commerce

Web syndication has been used to distribute product content such as feature descriptions, images, and specifications. As manufacturers are regarded as authorities and most sales are not achieved on manufacturer websites, manufacturers allow retailers or dealers to publish the information on their sites. Through syndication, manufacturers may pass relevant information to channel partners.[8] Such web syndication has been shown to increase sales.[9]

Web syndication has also been found effective as a search engine optimization technique.[10]

See also

[edit]

- RSS
- Atom (web standard)
- Broadcast syndication
- Content delivery platform
- Feed icon
- hAtom
- List of comic strip syndicates
- List of streaming media systems
- Print syndication
- Protection of Broadcasts and Broadcasting Organizations Treaty
- Push technology
- Software as a service
- Usenet

References

[edit]

1. ^ *Hammersley, Ben (2005). Developing Feeds with RSS and Atom. Sebastopol: O'Reilly. ISBN 0-596-00881-3.*
2. ^ "Offers Plan to Syndicate Programs." The New York Times. 12 Oct 1924: Special Features Radio Automobiles Page 14
3. ^ Broadcast syndication
4. ^ Museum of Broadcast Communications Syndication Archived 9 October 2009 at the Wayback Machine
5. ^ *Lash, Alex (3 October 1997). "W3C takes first step toward RDF spec". Archived from the original on 13 July 2012. Retrieved 16 February 2007.*
6. ^ *"Internet Content Syndication: Content Creation and Distribution in an Expanding Internet Universe" (PDF). Internet Content Syndication Council. May 2008.*
7. ^ Netcraft.com "Web Server Survey."
8. ^ Forrester Research "Must Haves for Manufacturer Web Sites"
9. ^ Internet Retailer More product content equals more sales at eCost.com
10. ^ How to Increase Your Search Ranking Fresh Business Thinking

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Web syndication

History

Blogging
Podcasting
Vlogging
Web syndication technology

Types

- Art
- Bloggernacle
- Classical music
- Corporate
- Dream diary
- Edublog
- Electronic journal
- Fake
- Family
- Fashion
- Food
- Health
- Law
- Lifelog
- MP3
- News
- Photoblog
- Police
- Political
- Project
- Reverse
- Travel
- Warblog

Technology	**General**	○ BitTorrent ○ Feed URI scheme
	Features	○ Linkback ○ Permalink ○ Ping ○ Pingback ○ Reblogging ○ Refback ○ Rollback ○ Trackback
	Mechanism	○ Thread ○ Geotagging ○ RSS enclosure ○ Synchronization
	Memetics	○ Atom feed ○ Data feed ○ Photofeed ○ Product feed ○ RDF feed ○ Web feed
	RSS	○ GeoRSS ○ MRSS ○ RSS TV
	Social	○ Inter-process communication ○ Mashup ○ Referencing ○ RSS editor ○ RSS tracking ○ Streaming media
	Standard	○ OPML ○ RSS Advisory Board ○ Usenet ○ World Wide Web ○ XBEL ○ XOXO

- Audio podcast
- Enhanced podcast
- Mobilecast
- Narrowcasting
- Peercasting
- Screencast
- Slidecasting
- Videocast
- Webcomic
- Webtoon
- Web series

Form

- Anonymous blogging
- Collaborative blog
- Columnist
- Instant messaging
- Liveblogging
- Microblog
- Mobile blogging
- Spam blog
- Video blogging
- Motovlogging

Media

Alternative media

- Carnivals
- Fiction
- Journalism
  - Citizen
  - Database
- Online diary
- Search engines
- Sideblog
- Software
- Web directory

Micromedia

- Aggregation
  - News
  - Poll
  - Review
  - Search
  - Video
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- Broadcatching
- Hashtag
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Frequently Asked Questions

Why is local SEO important for small businesses?

Local SEO helps small businesses attract customers from their immediate area, which is crucial for brick-and-mortar stores and service providers. By optimizing local listings, using location-based keywords, and maintaining accurate NAP information, you increase visibility, build trust, and drive more foot traffic.

How does content marketing impact SEO?

Content marketing and SEO work hand-in-hand. High-quality, relevant content attracts readers, earns backlinks, and encourages longer time spent on your site'factors that all contribute to better search engine rankings. Engaging, well-optimized content also improves user experience and helps convert visitors into customers.

How can search engine optimisation consultants help my business?

Search engine optimisation consultants analyze your website and its performance, identify issues, and recommend strategies to improve your search rankings. They provide guidance on keyword selection, on-page optimization, link building, and content strategy to increase visibility and attract more traffic.

What is a local SEO agency?

A local SEO agency specializes in improving a business's visibility within a specific geographic area. They focus on optimizing local citations, managing Google My Business profiles, and targeting location-based keywords to attract nearby customers.

How do I find the best SEO company in Sydney?

To find the best SEO company in Sydney, look for a provider with a proven track record of success, transparent reporting, and a clear understanding of your business•s goals. Check reviews, case studies, and client testimonials to ensure you are choosing a reputable partner.

What is the difference between local SEO and general SEO?

General SEO focuses on improving a website's visibility on a broader scale, often targeting national or international audiences. Local SEO, on the other hand, zeroes in on geographic areas, helping businesses attract nearby customers through local keywords, directory listings, and Google My Business optimization.

SEO services

SEO Sydney

Phone : 1300 684 339

City : Sydney

State : NSW

Zip : 2000

Google Business Profile

Google Business Website

Company Website : https://sydney.website/seo-sydney/

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