Search Engine Optimization: A Survey

Akula Pavan Sai[1], Teja kondepudi[2], Krishna Prasad Satti[3], Navneet Kaur[4]

[1]*Student, Dep. of Computer Science and Engineering, Lovely Professional University, Punjab, India.*
[2]*Student, Dep. of Computer Science and Engineering, Lovely Professional University, Punjab, India.*
[3]*Student, Dep. of Computer Science and Engineering, Lovely Professional University, Punjab, India.*
[4]*Assistant Professor, Dep. of Computer Science and Engineering, Lovely Professional University, Punjab, India.*

---***---

Abstract- *This paper presents views on role of SEO in digital marketing, how it has broad range of audience, what are practices of SEO, career paths and major search engines like Google, Yahoo, etc. This paper also includes information about earlier SEOs and currently using SEOs. Mostly we described Google, because it's known for its largest market share out of all search engines and it has large audience network. This paper also reviewed what kind of strategies webmasters used to gain good page rank, how SEOs like google planned to penalize them and made changes to their alogorithms and updates. We concluded how different are career paths in digital marketing and what are positions of SEO experts in the world of digital marketing currently and future scope of SEO learners.*

Keywords: SEO, digital marketing, Google, websites, page rank

1. INTRODUCTION

SEO: Search engine optimization, a method to boost a web site's familiarity and hierarchy. SEO is very exciting tool for digital marketing, perhaps became the most compulsory thing in digital marketing. Review work of Dr. Madhu Bala et. al, [2] on digital marketing gave brief explanation on how aSEO holds the portion in digital marketing. A strategy to gain broad audience is only possible with SEO. As we all know that trending SEO, Google where billion searches per day are known to be executed on the platform. SEO is known to be the foremost specialties in digital marketing realm. There are many specializations if someone choose SEO as career path, such as local SEO, technical SEO or SEO copy writer. There are many kinds of SEOs. White hat SEOs use most significant algorithms produced by popular search engines like Google etc. While Black hat SEOs tend to follow extra ways to gain audience through manipulative practices. Grey hat SEO's methods are mixed with both kinds. SEO fits into a greater digital marketing strategy, where as other digital marketing roles work in a close alignment with SEO's strategies. The other roles in the digital marketing Umbrella are bidding paid advertisements.

1.1 Transformation of SEO

Search engine firstly created programs called as robots. They were also known as crawlers or spiders. And each search engine uses a unique robot to them. These robots are designed to optimise the web to find latest pages and information on web, the other method is finding through links. If any other websites are linked to the web site that you have created. Then this finds an easy path for robots to follow. Robots can acquire this map for exploration of web and to discover new pages continually. Earlier web masters submitted the sites to SEOs that the robots may find it. But now robots can do their job on their own. If you add the site you created to free services like Google webmasters Tools, that will help you in this detection procedure. Once you opt for such service, robot discovers a new page or site and analyse the content and data on the web page to find out what the page is about and rank the page on basis of topic that page contains then site is added to an index.

Each page is categorized so search engine can swiftly refer to the data needed and return relevant results for user's search query. In this way whenever a user performs a search query, search engine works through index to find relevant webpages they have crawled and analysed. Then they return the results in seconds. In that time of releasing results, search engine firstly determines which are the most suitable results to user's query. And categorise the outcomes corresponding to the certainty of a web site. Previously search engines would only look at the content parameters on the page which are frequently used words also known as keywords. But now search engine grown a lot smarter and there are lot of factors that influence relevant search result. Loren Baker [5] have gone through the history and revolution of SEO with his research, that's what helped to gather material of SEO from past.

2 USAGE OF SEO

2.1 In 1940's

There were no shadows of working SEOs in these years but engineers often interested in future of science and inventions as part of this, there was a thought this pushed them to look into SEO kind of invention. Watching the world changing into a technology dependable land, they want a technology that creates a virtually limitless, reliable, rapid, extensible associative memory storage and retrieval system. There is also an article written by Vanocur Bush and titled as "As We May Think", relates this kind of time revolution. Later Gerard Salton, who is known as father of modern search technology in those years created an idea that concerns search engine and developed the informational retrieval system called SMART. He also authored a book called A theory of indexing, which feature all his search engine tests and concepts like statistical weighting, relevancy algorithms, and so on. After that following all the years, they moved a step ahead in the complete innovation of search engine, like Ted Nelson who created a computer network with simple user interface and named it as Xanadu. His work is also one of the inspirations to create WWW which is acronym of "World Wide Web". After a short time of this, a service called ARPANET was created by ARPA. It was a secure and fast computer network and part of the US Department of Défense. This network allowed transmission of information across long distances. It became one of the great technology innovations and initiated the world to move with internet.

2.2 From 1990's

In 1990s Alan Emtage created first ever search engine which is known as Archie, short term for archives. It recovers files from database by selecting a suitable user query using regular expressions. He also created a method which is known as template indexing method that would allow the search engine, he created to index freely available or public domain images, documents, services and sounds on the network. This search engine didn't use keywords to find relevant documents like other modern search engines we're using now. At that time Archie consists of 2.6 million files and processed nearly 50,000 queries per day, these all are generated by thousands of users across the world. After Archie, there were two more similar search engines born by following the trend and popularity of Archie. Those both were known as Jughead and Veronica created to index plain text files.

There was also famous technical innovation by Tim Berners-Lee, who had created the World Wide Web in 1991.WWW was made based on a concept of hyper-text to help researchers in sharing and updating information among them. In the same year the first web site was created and put online. In next year 1993, there was a creation of a bot to measure the growth of the web. The bot is known as World Wide web Wanderer, which later became a problem than a solution. It scrambled websites and gave access to pages hundreds of times a day, also created a suspicion on robots. At last, public and webmasters mistrusted the work of this bot. In following to Wanderer, ALIWEB was created for indexing of the web and crawled meta information of pages. It helped owners by resolving the issues created by bots, to do such work it included their site in the search index, along with their webpage description. Latterly in 1993, another three new search engines were created. One of them is WWW worm which indexed titles and URLs by listing them in order the discovery. Other one is known as Jump station which helped to collect the headers and titles from webpages and restore these using a simple linear search. The last one in these three search engines was RBSE or Repository Based Software Engineering spider

These three search engines are used to find content or information only if you know the exact name of what you were looking. Meanwhile they were around six standford graduates created search engine known as Excite, there aim was to deliver mega amount of information on the web for all the search queries.

After analzing massive internet growth, there were two electrical engineering students named David Filo and Jerry Yang from standford who created a familiar SEO, Yahoo which we all know today, just to win a fantasy basketball league so that they could use the web for sports information updates through collection of files. Later several updates, where users used to find new information after clicking on provided directory which is know as David and Jerry's Guide to the World Wide Web. But they found that name of this SEO was too long and not a catchy one for the users. So later they named it as Yahoo. As trend of this two new SEOs, Yahoo and Excite created a competition among them. They started getting more funds from different companies, buisnesses, and organisations to advertize and promote their market on the web. The aim of showing relavent content for the user's search query is misplaced and turned into business. But soon while all of this happening, a new SEO had been introduced by Larry and Sergey and it was named as Google, which later created a revolution in search engine world. In initial level of this SEO development seemed very hard to move. After so much drama to raise the funds for development, they finally made this by creating a simple interface for the users to run their queries without any clumsiness with multiple ad links or spammy pages. At first they followed page ranking through casting votes on basis of multiple links on the page. Later they changed the algorithm as it became easy for the page holders to gain good page rank

by just inserting more links on their page. And now they change their alogirthms more than 600 times per year to provide their users most significant and accurate relevant information for their search query. Vineet Kumar Gunjan et. al,[3] Built their work on Google SEO through their research and assisted to know the beginings of Google and moved this paper forward. After Google there were many Search engines introduced to the world but only few like Google had hit the Global popularity.

3. FAMILIAR ALGORITHMS USED BY SEO:

At intial stage, SEOs are not so fond of algorithms to show webpages in a ranking order, they were just used to deliver webpages on based on number of links and data getting introduced through the page. Later it created chaos to find relevant data for the search query done by users. These algorithms are mainly for showing users most accurate relevant content rather than completely advertized content. So algorithms optimize the webpages and webmaster's content on webpage and arrange them in hiearchy. Back then Google released some updates regarding this ranking factors. Florida, Brandy and Austin are some of the algorithms followed by Google in their early stage. Google follows several ranking factors and hundreds of algorithms to deliver most accurate result for the search query. And changing the algorithms is because of manipulation of webmasters to rank on top of SEO even not having matchable content. So Familiar SEO like google keeps these algorithms confidential. In the part of demonstrating these algorithms, we found some mostly used algorithms and updates by Google. Asim Shahzad et.al [1] analysed the effect of SEO methods which capable of improving the research paper visibility.

Panda:

Panda is used to diminish the ratings for not so good websites, sites that aren't genuine enough with the integrity of their content, sites having many disruptions and unnecessary links. On the other hand, it provides good ratings for genuine and skilled websites with their own and informative content with in-depth reports and analysis.

Penguin:

Penguin is used to bring down low-grade subjects. Even with the presence of Panda solving all the low-quality content it wasn't enough. Penguin was then designed. Its purpose was to gain its authority over and to decrease the value of the various black hat spam methods

Humming bird:

Then comes Hummingbird. It brought a lot of change in Google search history, importantly in Contextual and Conversational search. The semantic search and natural language processing which consider the thoughts desires and search engines of humans about what they were finding, the earlier method of using keywords in a website became less significant. Which meant the practice of spamming a website with keywords and fake names was declining yet again, even though it still is under use today.

Pigeon

The work of the Pigeon update is improving the distinguishability of the websites. It linked old-fashioned ratings aspects into local rating aspects. It also prompted local searches by renovating the distance limitations and location rating limitations of Google maps. This update was established deep inside Google's complete search skills, along with various rating signs that used in web search and significant aspects that upgraded complete search events.

Mobile:

At starting stages, the fear was if this update would also affect the desktop search. Because it was created to check if or if not, the website is mobile friendly and its ranking. Webmasters were priorly warned by Google to be ready. Due to this a lot of chaos was created. And people thought it would be very disastrous for any site not having mobile friendly version. But it wasn't up to their expectations but rather plain. This was nick named Mobilegeddon by most of the press.

These are some of the Algorithms that brought Google into fame light. Google also used Algorithms like Fred, Payday, EMD (Exact Match Domain), Page Layout Algorithm and some other.

4. CAREER IN SEO:

SEO, as of today is one of the subjects of digital marketing. It can be learnt online or taken classes which helps most of the experts to gain and learn skills and to get promotions in the companies they work. Fang Liu et. al, [4] have done research paper on the online marketing challenge where types of materials and career hope in digital marketing has been created after going through there research work and helped to know more detailed knowledge on needed technologies and strategies to secure a job career. They should be having expertise in data analytics, marketing, research, writing, web content, also in tools like HTML, Moz, Raven. As told, most of the experts in this fields are people who got experiences in marketing on their own.

  Now a days they have more demand and are hired by most of the companies and many web developers and content creators to get success in digital campaigns. Either way positions like SEO manager, Digital marketer, content marketer care sure is promising and interesting for anyone to choose and has growth.

5. CONCLUSIONS

SEO became a primary asset of Digital Marketing. It has no pull back from many years. Day by day people's interest is appraising and use of SEO seems enormous. Many tools and updation of algorithms are delivering exceptional results by SEOs to the millions of users. As a webmaster one should have prior knowledge and skills of SEO tools to manage website rank on any search engine. Not only Google but there were few countries with their self-reliant SEOs like China has its mostly preferred and used search engine Baidu, where Russia uses SEO called Yandex rather then using World's most popular Google.

Career with SEO skills has more future scope along with top career paths like Machine learning, Data Science, etc., now a days Website for a company became supreme part of their marketing whether it is a small cap or large cap, maintaining a website for boosting their business by gaining clients over social media is a topmost trend. Even maintaining a personal blog or your research work to show case the world what you are up to, one should maintain the disciplined pattern designed by SEOs to help the website gain good page rank and increase in visitors. So knowing roots of SEOs and having at least minuscule knowledge is good for one's growth in this Digital World.

REFERENCES:

1. Asim Shahzad et. al, 'The Impact of Search Engine Optimization on The Visibility of Research Paper and Citations', International Journal on Informatics Visualization, Vol 1, No 4-2, pp. 195-198, 2017
2. Dr. Madhu Bala et. al, 'Critical Review of Digital Marketing', International Journal of Management, IT & Engineering, vol 8, Issue No 1, pp. 329-333, 2018
3. Vineet Kumar Gunjan et. al, 'Search engine optimization with Google', International Journal of Computer Science Issues, vol 9, Issue 1, No 3, 2012
4. Fang Liu et. al, 'The Google Online Marketing Challenge', International Journal of Interactive Advertizing, vol 9(1), No 49-55, 2008
5. Loren Baker '20+ Years of SEO: A Brief History of Search Engine Optimization', Search Journal on Evoluation of search engines, Content No 2-4, 2021