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Improving searchability of products in E-commerce platforms

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Abstract

The booming internet commerce has resulted in an added challenge in the visibility and discovery of products on the internet. The ability to search for searchability is a fundamental key in shaping a purchase decision and conversion rate as well as customer satisfaction. The paper reviews the approaches that can be used in order to improve the searchability of products in five main dimensions: the importance of making products searchable in e-business, the role of product taxonomy and categorization, making use of search engine optimization (SEO), using smart search algorithms and filters, and integrating product page designing and personalization. Each dimension is discussed with literature, industry practice, and emerging technological practices used to prove the dimensions. The research makes it clear that successful searchability may not be only a technical task but, rather, a strategic, user-oriented activity. There are some recommendations that are provided to integrate structured data, semantic search, adaptive taxonomy, and personal user experience in order to make sure the e-commerce platforms retain their competitiveness in terms of the dynamic digital market.

Keywords: Searchability; E-Commerce; SEO; Product Taxonomy; Personalization

1. Introduction

1.1. Importance of Searchability in E-Commerce

In the new fast-changing environment of the digital retail, consumer accessibility of the products in terms of their quickness and accuracy is a determining factor of e-commerce success. Searchability involves the concept of how easy to find the desired goods in an online store, both in terms of the intuitiveness of the navigation and search algorithm, and well-designed indexing of the product information [1]. A research study conducted by Nielsen Norman Group further explains that affordability or the lack of search capabilities is one of the leading factors that cause customers to drop their purchases online [2]. Failure of the customer to find a product efficiently decreases the conversion rates and revenue drastically because it increases the possibility of the customer abandoning the cart.

Multiple factors that influence e-commerce performance, such as customer satisfaction, retention, and brand loyalty, are related to searchability. An easy search experience is not only encouraging the users to complete transactions but also changing their opinion on the platform, regarding it as reliable and user-friendly [3]. The e-commerce customer of today does not tolerate much lag time in searches or product listing, and excessive latency during search or irrelevant product listing has the potential to destroy the assumed trustworthiness of the platform [4]. Studies have shown that 43 percent of internet shoppers will use the search bar when they visit a site; in other words, they bypass other means of navigating the site [5]. This is why e-commerce enterprises need to initially invest in optimised search functions.

Furthermore, searchability is directly related to product visibility in case sellers work in multi-vendor markets like Amazon, eBay, Alibaba, etc. In the case of SMEs, an efficient internal search mechanism is coveted to ensure that the

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SMEs are able to compete with more established brands [6]. Without proper search optimization, products are liable to turn invisible in the busy online market. This will make less impression, fewer clicks, and, in the end, lower sales.

Another depth to the value of searchability is the inter-relationship between internal search and external discoverability. Systems with a high correlation between their internal search indexing and external search engine optimization (SEO) mean that products are not only easy to find on the site, but also visible in the search engine results pages (SERPs) [7]. Therefore, the searchability plays a mediating role between the internal ecosystem of the platform and the digital marketplace.

By way of conclusion, searchability is not only a technical attribute; it is a strategic requirement to e-commerce success. Those platforms that are focused on search experience design are more competitive, attract repeat customers, and yield stronger sales. Conversely, failure to take care of this component may result in frustration to the customers, lower participation, and eventually the loss of market share.

2. Designing Effective Product Taxonomy and Categorization

An initial action of enhancing product searchability will be preparing a clear product taxonomy that can be defined as a hierarchical product organization that classifies products in terms of a category, subcategory, and attribute [8]. Taxonomy in e-commerce has the objective of leading customers to the desired goods with the least input or effort on their part, in the same way that human beings think logically in locating goods.

A good product taxonomy has to be specific and inclusive. Categories that are too broad are cumbersome to navigate, and categories that are too fine are overwhelming and give too many options [9]. To give an example, within a fashion e-commerce store, the category of Men's Clothing may break up into Shirts, Trousers, Outerwear, and even further, with sub-categories, such as Formal Shirts and Casual Shirts. The subcategories must be mutually exclusive (MECE principle): each category should not overlap with one another, and they should be exhaustive: all the categories are considered altogether [10]. Besides, metadata tagging is a key to improving taxonomy. Colors, sizes, brands, material, and style tags enable users to narrow down the search process with the help of the filters without dissimilarity in the logical order of categories.

Taxonomy is also a factor that will affect how search algorithms perform in the back-end of the business. By structured product data, a more filtered search result can be found as the search queries are matched against indexed data [11]. Improperly defined categories may cause discrepancies between queries and responses, and declining relevance of the resultant products. Consequently, taxonomy development is to be a cross-collaboration between domain experts, UX designers, and data scientists.

The area of cultural and linguistic adaptation is the one that most of the time goes unnoticed. Electronic commerce sites covering international markets should ensure that the product categories are presented in terms of name and shopping habits under consideration. Consider, e.g., that a jumper in the UK is what Americans call a sweater and that such a linguistic difference needs to be accommodated in categorical naming as well as search indexing [12]. Likewise, products that have a particular region attached to them, such as local food products or seasonal clothing, will need to be categorized differently to better discoverability for target markets.

Moreover, changing dynamism taxonomies (taxonomies that change according to the emerging trends) are gaining eminence. Through the analysis of search histories and purchase histories along with seasonal demands, the platforms are capable of highlighting temporary, or trending categories (such as Back-to-School Supplies or Summer Essentials) [13]. Such responsiveness, in addition to enhancing searchability, is also a trigger to impulse purchases as it shifts the attention to the relevant product groupings at the right time.

The blueprint of an e-commerce platform's navigational architecture, in the end, is the product taxonomy. The effective taxonomy will reduce the cognitive load to the customers, as well as enable correct indexing and facilitate integration with filtering and recommendation systems. It is therefore a central element to any searchability enhancement effort.

3. Leveraging Search Engine Optimization (SEO) for Product Pages

Search Engine Optimization (SEO) is an important element towards the searchability of products within an e-commerce site and also within an external search engine, as shown in Figure 1. Although on-site discoverability follows the guidelines of internal search systems, such as Amazon, SEO helps the products to emerge in search engines, such as Google, Bing, and Yahoo [14]. That is why SEO has a strategic character rather than being a supplementary feature.

There are various important factors in a well-optimised product page, and these are: proper usage of keywords, product description, use of structured data markup, imagery, and URL structure [15]. Keywords constitute one of the main facets of SEO since they fill in the gap between the search motive of a customer and the listing of the product. By using the keyword search with the help of such tools as Google Keyword Planner or SEMrush, the e-commerce managers will realize low-competition and high-volume search terms [1]. The terms can then be used organically as part of product titles, descriptions, and meta tags.

Organized data, as applied through schema.org markup, offers search engines information like price, availability, ratings, and brand of a product in detail. This makes search results more relevant as well as facilitating rich snippets on search engine results pages (SERPS), which have the potential to increase click-throughs [2]. As an example, an electronic retailer with an e-commerce website can advertise products, such as a Samsung 55-inch 4K UHD Smart TV, which will feature star reviews and pricing in Google search results, using structured data.

Other important aspects of SEO are image optimization. Compressed images with high quality to load quickly, and descriptive alt text could increase the performance of a page and make it accessible [3]. Since Google Images is a strong source of traffic, when images are optimized with relevant keywords, there is an increased possibility of discovering products when people perform an image search.

In addition, mobile optimization is not optional anymore. Since an increasing percentage of online sales is thanks to mobile commerce (m-commerce), product pages need to be grammatically correct and open fast on smartphones and tablets [4]. Google has also introduced mobile-first indexing, according to which the mobile versions of pages undergo prioritization in the ranking algorithms, which is why failing to optimize mobile can negatively affect search visibility.

SEO goes even further into technical performance. Duplicate material and slow page loading, among other factors, may have a substantial effect on the rankings [5]. On big e-commerce sites with thousands of SKUs, canonical tags, XML sitemaps, and a well-designed URL structure can ensure that search engines do not index pages in the wrong way. Linking within the pages also adds to SEO as it guides the search engines on the affiliation existing between various categories of products.

Notably, SEO is not a one-off procedure but an active process. The direction of search traffic is changing with consumer interest, seasonal requirements, and competitive action. An up-to-date product description, updated image rotation, and tracking the search performance statistics keep the products competitive in the organic search listing. Other platforms, such as Amazon, also have search optimization techniques of their own (called A9 SEO), and sellers must learn how to optimize their listings in that market [6].

Incorporating SEO as a part of an e-commerce platform has the potential to promote the visibility of products, acquire desired traffic, and eventually increase the conversion rate of the venture. There is a synergy between optimizing internal search and external SEO that forms the holistic effectiveness of optimizing product searchability.



Figure 1 Diagram highlighting key SEO techniques such as keyword research, high-quality content, link building, and image optimization used to boost visibility and performance of product pages

4. Implementing Intelligent Search Algorithms and Filters

This is because the essence of e-commerce searchability lies with the search algorithm quality. Irrelevant results typically occur when using a traditional, keyword-based search does not have the ability to decipher nuance in customer intent. The recent platforms have employed the use of more efficient intelligent search functions through Natural Language Processing (NLP), machine learning (ML), and semantic search technologies [7].

NLP also helps to make human language more understandable to the computer, in which computers/search engines are more versed using the context, synonyms, and synonymous variants. As an example, when a user enters the query with a request to find some running shoes, the algorithm must also be capable of identifying similar queries, such as jogging sneakers or athletic footwear [8]. Semantic search is another enhancement to it, as it associates concepts and not just the keywords. That is particularly useful with ambiguous words; for instance, a search using the word apple could refer to either the piece of fruit or the technology company, and the semantic processing can be utilized in deducing which one they're looking for based on the surroundings.

Machine learning-based models optimize search models by tracking the activity of users through clicks, time on page, and purchasing behaviours over time. Such a feedback loop makes personal ranking possible, meaning that the products that can best connect to the interests of the specific user are allowed to be prioritized [9]. Major marketplaces such as Amazon and Alibaba operate on ML-based ranking algorithms that are highly dynamic and are constantly changing in order to maximize conversion.

Filtering systems supplement smart search by enabling the user to narrow down search results on the basis of certain properties such as price, brand, size, and color. Advanced filtering may be viewed as a contextual filter, e.g., "same-day delivery" or "eco-friendly products." Notice that the discovery process becomes faster, and it also decreases resentment of irrelevant results by utilizing these filters [10]. But cumbersome or inadequately structured filters may be more off-putting than helpful, and it is important to develop user-friendly, self-explanatory filtering frontends.

Other tools that can improve the intelligence capability of search are autocomplete and query suggestion. Autocomplete allows users to narrow their search before they can complete their typing and can often expose them to products that they may not have thought of. It is possible to encourage exploration and boost purchases when the query suggestions are based on current popular searches and trending products [11].

Voice searchability is the new smart search aspect in online shopping. We are seeing a growth in customers using voice commands when shopping online with the advancement of smart assistants such as Alexa, Google Assistant, and Siri. To

optimize voice search, you need to adjust search algorithms in order to understand conversational search and factor in the disparity between typed and spoken language [12].

Intelligent search also requires its infrastructure to be implemented through technology. This entails keeping search indexes current, low-latency query processing, and concurrent processing of large-scale requests without affecting performance. Search as a Service Cloud-based search engines like the ones offered by Elasticsearch and Algolia have started being used by e-commerce companies in search of scalable, high-performance search services [13].

Finally, the pro-search systems facilitate a dynamic context-sensitive searchability that complicates the relationship between searchability and a match-based interaction stream and resembles the way people communicate. This enhances both relevant character and user interaction and satisfaction. To further clarify how taxonomy can shape product discoverability, the table below contrasts the characteristics and use cases of static versus dynamic taxonomies in e-commerce.

Table 1 Comparison of Static vs Dynamic Taxonomies in E-Commerce

Criteria	Static Taxonomy	Dynamic Taxonomy
Definition	Pre-defined, fixed hierarchical product categories	Adaptable category structures based on data trends
Flexibility	Low – hardcoded structure	High – updated based on user behavior and trends
Use Cases	Essential products, standardized items	Seasonal items, trending products, event-based sales
Examples	Electronics → Laptops → Gaming Laptops	“Back-to-School Deals”, “Trending Summer Essentials”
Responsiveness to Demand	Slow – requires manual updates	Fast – can auto-update based on analytics
Cultural/Regional Adaptability	Limited unless restructured	Easily adaptable by integrating localized insights
Implementation Complexity	Low – once built, minimal maintenance	High – requires analytics, monitoring, and redesign

5. User-Centered Design and Personalization in Product Discovery

Searchability is not exclusively a technical piece of work; it is also enshrined in user experience (UX) design. In user-centered search, the needs, preferences, and behaviour of the shopper become central in the search and discovery process [14]. This is started by knowing the audience in user research, the creation of personas, and journey maps.

One of the major aspects in the augmentation of searchability is personalization. Changes in e-commerce will be to take advantage of the history of browsing, recent purchases, and demographic data to present a search result to an individual [15]. As a simple example, when a customer consistently buys organic skincare products, the search algorithm can now give organic products a higher ranking in other future searches with a word related to skin care. The speed at which personalization helps people discover products is not the only way it can be used to gain customer loyalty; the perceived relevance of the platform also intensifies.

There is a direct influence of search based on the user interface (UI) design. The visibility of filters, the location of the search bar, and the clarity of the labeling of the categories all play a role in how readily a customer can search products. According to best practices, the search bar should be centered at the top of each page, as well as being viewable both in the desktop and mobile versions of a site [1]. Labeling, the use of minimalistic layouts, and responsive design are a part of a frictionless search experience.

It is also possible to generate more discovery with behavioral triggers. Among them are such features as Customers Also Bought, Recently Viewed Items, and Recommended for you that introduce new product discovery outside direct search requests. Although they are usually driven by recommendation algorithms, these features are to be naturally fit in with the rest of the UX in a manner that does not intrude [2].

The other important operability in user-focused search design is accessibility. Interfaces on the search should be accessible to individuals with disabilities, which means that they should be compatible with screen readers, have text equivalents of the non-textual ones, and be clickable by the keyboard. Accessibility standards such as Web Content Accessibility Guidelines (WCAG) can give an advantage not only by expansion of the customer base but also a positive reflection on the image of the brand reputation [3].

Usability studies and A/B testing can help make the search an experience that can continue to be improved. Testing of search layouts of different styles, filter designs, and autocomplete suggestions can enable platforms to develop empirical evidence on the most appropriate search layouts for their audience. This recurrent process is the key that would make the search function grow with the varying expectations of customers and the market trends [4].

Essentially, user-centered design and customization apostrophe the motivation searchability as somebody weapon of corny into a differentiator. The platforms that are doing the best job in these areas bring a new shopping experience that is familiar, engaging, and individual to the customer.

6. Future Directions

Although the existing methods behind enhancing searchability on e-commerce websites are quite potent, upcoming technologies and adaptive consumer activities will keep on redefining standard operating procedures. The future is bound to be rooted in some main areas of focus.

To begin with, it will have the AI-powered conversational search, whereby the user will be able to interact with the platform via natural language interactions as if talking to a sales assistant. The change will require greater investment in Natural Language Understanding (NLU) methods and tools triggered by boxes for context-aware searches that decode multi-turn requests and complex requests.

Secondly, there will be a fusion of augmented reality (AR) and visual search, which will lead to a change in product discovery. Functions such as visual search, where a customer can place an image to search for similar items, will not only reduce the need for text queries but are less dependent on users knowing the name of a particular product.

Third, hyper-personalization, enabled by the use of real-time behavioral data, will help narrow down search results, as well as pre-empt user needs where the user does not express these. This will be a predictive capacity that will require developments in big data analytics, machine learning and privacy-preserving personalization methods.

The emergence of voice commerce is also expected to rise with the penetration of voice-assistants into the household with smart speakers. Search algorithms will need to learn how to adjust to the conversational-style phrasing as well as context clues people may include when using a voice input.

Last, but not least, ethical and inclusive design will have an even more critical importance. Since algorithms are responsible for deciding what the user is to see, the development of transparency, fairness, and accessibility will be essential to creating trust. The e-commerce platform will have to overcome the problem of algorithmic bias, defend user privacy, and comply with the shifting regulatory frameworks in data governance. The e-commerce site is able to remain in the market to make an even more relevant, intuitive, and engaging search experience in an evolving digital marketplace.

7. Conclusion

Enhancing searchability of the products in online retail stores is a multidimensional process, which includes the inclusion of technical creativity, content planning, and user experience design. As is illustrated in this paper, searchability is no longer restricted to the keyword matching of the more than searchability is now about keyword matching, it has expanded to include rational organisation of product data, not only the use of on-site search, but search engine optimisation in support of internal and external gaps, and the use of intelligent search query technology to determine the meaning and intent of a search request, as well as the personalisation of search results in relation to individual characteristics. Personalization increases user interaction, making sure that the shopping process is made to feel personalized, and the accessibility aspects increase the inclusivity on the platform. Finally, searchability is a form of competitive advantage because platforms that put a premium on searchability have the best shot at driving more conversions and building customer loyalty and market leadership in a world that's increasingly crowded with platforms that are vying for customers. The results show that companies should not treat searchability as a secondary aspect of

their e-commerce strategy and should not be limited by just focusing on continuous improvement of searchability by analysing the data, updating the technologies, and adapting according to the evolving demand of the customers.

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