

May 2023

Hybrid Search: Matching both meaning and words

An overview of hybrid search technology and how it enhances site search

Raffle Search is a world-leading search engine powered by advanced deep-learning vector search technology. It's designed to accurately understand and interpret users' search queries, enabling it to provide highly accurate, relevant, and personalized search results.

Raffle has achieved a leadership position in this field by investing in research and development into a fast deep-learning methodology that works without training data for new customers (zero-shot) and improves over time. Raffle's hybrid search technology combines deep semantic search with traditional keyword-based search to allow users to find what they are looking for based on context and word association.

Raffle AI-based Insights tool helps the customer to identify usage trends and questions the users cannot answer, making it easy for the customer to improve their business's content accordingly.

This insights paper covers Raffle's hybrid search technology, gives background on the most significant developments in search, and details how Raffle's technology fits into the most vital current technology trends.

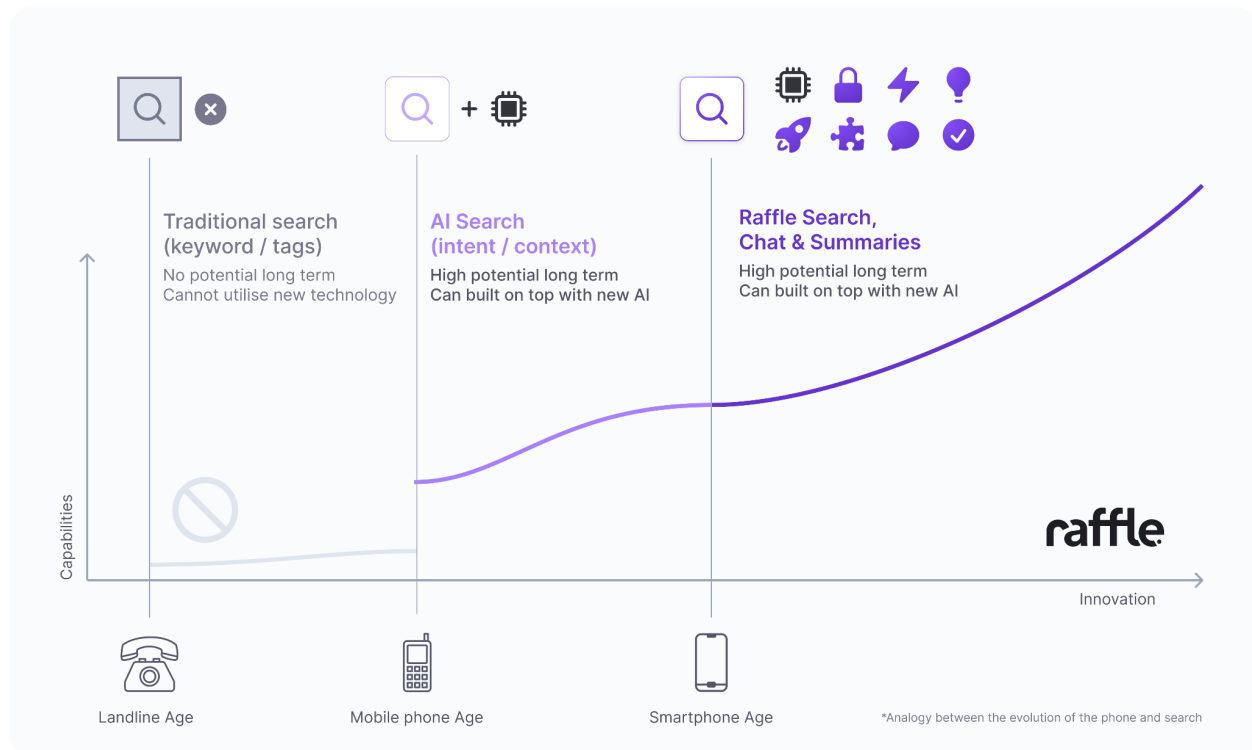
Background

Artificial intelligence is progressing at an astounding pace.

This opens possibilities for improving and even disrupting many of the tasks we perform with computers. However, it also comes with a lot of uncertainty and risks that we need to address. Raffle is an AI company at the forefront of this development, putting us in a good position to build highly performant and safe AI systems. In this series of three insights papers, we will address the following important topics:

1. Deep learning powered hybrid search - the foundation of highly accurate search that understands what you are looking for.
2. Large language models - the intelligent conversational interface to computers
3. The 4 pillars of Search for Businesses - Security, GDPR/HIPAA Compliance, Sustainability, and Disability Compliance (WASP2)

The development of search can be viewed as analogous to the development of the phone; the technology enables a whole range of application beyond the initial use case:



This is the first paper in the series on hybrid search. Raffle Search uses deep learning to find the correct answer for both simple and complex user queries. Our customers can use our AI-powered Insights tools to understand and improve their own data sources concerning what the users are searching for. This gives a

revolutionized search experience, enabling users to find the information they need faster and more efficiently than ever before.

Limitations of Traditional Search Technology

Search technology has one simple goal: to find what you're looking for.

To achieve this goal, search engines must undertake two crucial steps:

1. Understand the search query and
2. rank the results according to relevance.

However, it is important to note that the first step is critical and needs to be highly efficient for the other step to be effective.

For example, if a person types in the term "jaguar" on a search engine. The search engine may assume that the user is searching for information related to the animal species. However, the user might actually be interested in learning about the luxury car brand. We need the search engine to understand the user's intent. The simple query "jaguar" is not providing us with any context to distinguish, whereas "electric jaguar" or "jaguar natural habitat" do. The query "jaguar top speed" is still ambiguous on whether we are referring to the animal or the car.

Modern search engines should be able to understand the intent from the context and give you the right answer.

Example of Traditional Search versus Raffle Search

How we did it:

1. Raffle selected a random large company and used our crawler to get the content of their website.
2. We can now set up Raffle hybrid search for their website and compare it to their existing traditional search on the same queries. The existing search is shown on the left and Raffle search on the right in the example below.

This is Raffle Search Zero shot performance - out of the box, day one,- and it clearly shows the difference in understanding the intent and the context of the search string.

This is just one example, we will show many more towards the end of the document.

What is the nemo framework used for

Showing results for "How can you help me with better conference calls"
Search for "What is the nemo framework used for" instead

1 - 7 of 7

Most Relevant Most Recer

Create At The Speed Of Imagination | NVIDIA Studio

Revolutionize your creative process with RTX-accelerated workflows and exclusive AI-powered tools.

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Brainiac vs. Brain Cancer: Teen Tackles Deadly Disease | NVIDIA Blog

Kavya Kopparapu is one of many researchers using AI to fight the most deadly type of brain cancer. The difference is she's 17.

March 2018 | blogs.nvidia.com/blog/2018/03/15/teen-uses-ai-to-tackle-brain-cancer/

Integrating with Telephone Networks to Enable Real-Time AI Services | NVIDIA Technical Blog

Many of you may not recognize my company, Ribbon Communications. We are best known for building and securing large telecom networks for communication service...

August 2022 | developer.nvidia.com/blog/integrating-with-telephone-networks-to-enable-real-time-ai-services/

Live: Jensen Huang Keynotes NVIDIA's 2018 GPU Technology Conference | NVIDIA Blog

What is the nemo framework used for

The NVIDIA NeMo framework is an end-to-end, cloud-native enterprise framework used to build, customize, and deploy generative AI models with billions of parameters. It provides an accelerated workflow for training with 3D parallelism techniques, a choice of several customization techniques, and optimized at-scale inference of large-scale models for language and image applications, with multi-GPU and multi-node configurations. NeMo makes generative AI model development easy, cost-effective, and fast for enterprises.

en-us > ai-data-science > generative-ai > nemo-framework

NeMo Framework

Build, customize, and deploy generative AI models. Download Now What is the NVIDIA NeMo Framework? NVIDIA NeMo™, part of the NVIDIA AI platform, is an end-to-end, cloud-native enterprise framework to build, customize, and deploy generative AI models with billions of parameters. The NeMo framework provides an accelerated workflow for training with 3D parallelism techniques, a choice of several customization techniques, and optimized at-scale inference of large-scale models for language and image applications, with multi-GPU and multi-node configurations. NeMo makes generative AI model development...

Enterprise Support Battle hardened, tested, and verified containers built for enterprises. Try NeMo framework through a free, hands-on lab on NVIDIA LaunchPad. Try Now Key Features to Develop Large Language Models State-of-the-Art Training Techniques NeMo framework delivers high levels of training efficiency, making training of large-scale foundation models possible, using 3D parallelism techniques such as:

en-us > gcp-cloud > nemo-llm-service

NVIDIA NeMo LLM Service

Related Picasso BioNeMo NeMo Framework Generative AI Language Use Cases Build your own language models to deploy for intelligent enterprise generative AI applications.

Experience Megatron 530B. Leverage the power of NVIDIA Megatron 530B, one of the largest language models, through the NeMo LLM Service. Develop seamlessly across use cases. Take advantage of models for drug discovery, included in the cloud API and NVIDIA BioNeMo framework. Find more resources. See How the NeMo Service Works

en-us > ai-data-science > generative-ai

Enterprise-level Generative AI from NVIDIA

Take a Closer Look at NVIDIA's Generative AI Framework The NVIDIA NeMo framework, part of the NVIDIA AI platform, is an end-to-end, cloud-native enterprise framework to build, customize, and deploy generative AI mo... Powered by  of parameters. Learn More How Generative AI Goes to Work in the

Before giving more real world examples, we will make a deep dive into the underlying technology using “jaguar” example to explain how traditional search fails and explain how vectors are used to represent meaning (semantics).

Bag of words

Traditional search works by matching words between your search query and the document you are searching in. This means that word order does not matter; instead, we use a so-called bag of words representation. Take the following example with four (short) documents:

D1: Where the jaguar lives

D2: Jaguar seen in city

D3: Jaguar is available in many colors

D4: Jaguar on sale

Humans immediately understand from the context that documents 1 and 2 are about the animal and 3 and 4 are about the car. However, the traditional search will not understand, so if we see the question

“Where can I buy a blue jaguar?”,

We know that this is a question about a car - jaguars are not blue, and most of us don't keep jaguars as pets - so documents 3 and 4 should be the most relevant. In the bag of words approach we will simply

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count word overlap, and here, document 1 wins with a word overlap of two: “Where” and “jaguar.” The three other documents overlap with just the word “jaguar.” In traditional search, we use a document-term matrix to represent the bag of words for the knowledge source. This can be illustrated by our example like this:

		available	city	colors	in	jaguar	lives	many	on	sale	seen	the	where	Score
D1	Where the jaguar lives					1	1					1	1	2
D2	Jaguar seen in city		1		1	1					1			1
D3	Jaguar available in many colors	1		1	1	1		1						1
D4	Jaguar on sale					1			1	1				1
Q	Where can I buy a blue jaguar					1								

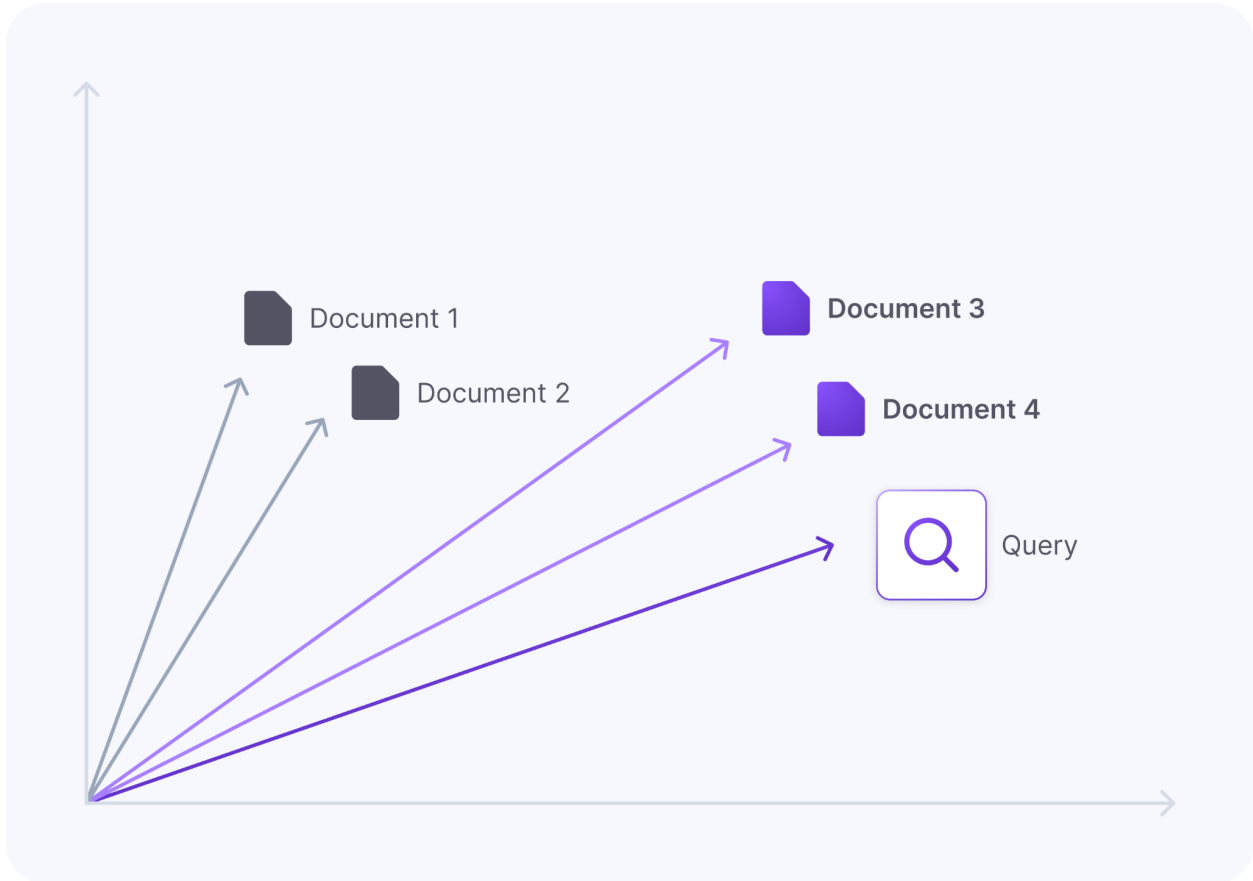
		available	city	colors	in	jaguar	lives	many	on	sale	seen	the	where	Score
D1	Where the jaguar lives					1	1					1	1	2
D2	Jaguar seen in city		1		1	1					1			1
D3	Jaguar available in many colors	1		1	1	1		1						1
D4	Jaguar on sale					1			1	1				1
Q	Where can I buy a blue jaguar					1							1	

While a bag-of-words search is fast due to the abundance of zeros in the matrix and efficient querying methods, it is challenged when it comes to semantics as this example illustrates.

Vector search - understanding intent with deep learning

The previous example demonstrated how keyword searches can be ineffective when the query does not match the exact wording. This limitation is not just theoretical; in the following real-life examples, we will illustrate how this can have significant consequences and why traditional word-based search engines are no longer adequate.

In vector search, documents and queries are mapped to vectors with a language model neural network. These vectors should reflect the intent and semantics of the content. We can visualize the documents and the query from above as two-dimensional vectors:



The example shows that the vectors capture the semantics: Since Documents 1 and 2 are closest in meaning, their vectors should also be more similar. The Query is closest in meaning to Documents 3 and 4 and vectors capture that. We get the most relevant answer if we choose the document with a vector closest to our query vector. So the recipe for vector search is, in principle, simple:

1. **Setting up the document vectors:** Map all your documents to vectors and store them and
2. **Search query ranking step:** Map your query to a vector, calculate the vector similarity with all document vectors, and return the top ones as your search result.

In reality, these vectors are high dimensional because semantics and intent are too complex to quantify in just a few dimensions. So this begs the following two questions:

1. **Training:** How do we construct the neural network method for mapping text to semantic vectors?
2. **Serving:** How to get the answers in real time when we use large neural networks and have many vectors (documents) to rank?

To answer this, we need to dig a bit deeper into Raffle’s core deep learning model optimization technology and vector search serving.

Raffle Search - the core

Raffle has, since 2018, built an AI-powered search consisting of the following three vector search optimization steps and a final hybrid search step. It is important to add, that this exact order and process makes AI the actual core of Raffle, and is one of the reasons, that Raffle heavily outperforms other search engines:

1. **Pretrained language models.** The language model maps the text input to vectors. We use language-specific and multi-language pre-trained *masked* language models like [BERT](#) as the building block. When Google introduced BERT in its search engine in 2019, it was considered the [largest improvement in search technology for a long time](#).
2. **Fine-tuning on labeled data.** The language model transforms the text into vector representations that we correlate (for example, using the dot product) to define a semantic similarity between a query and a piece of text of the knowledge source. We can transform this into a scoring function to optimize a training set of questions with answers in the knowledge source. Since we are starting from pre-trained models, we only need little labeled data.
3. **Question generation.** We use a second generative language model to generate questions for the user's knowledge base. This limits the need for labeled data. Raffle has a US patent application on question generation technology.
4. **Hybrid search.** We combine vector search (points 1. through 3.) with traditional keyword search to get a complete solution that excels in semantic and word-matching information retrieval.

So do all these additional efforts pay off in practice? The short answer is yes; it makes the difference between having a search that users will stop using after the first experience and one that they will want to return to again and again. A [study](#) done by Forrester's research team suggests that a product search experience that causes a significant level of frustration leads to an astonishing 68% rate of churn and burn, which we believe to be unacceptable.

Benchmarking Raffle Search

In our internal benchmarking, traditional search is typically capped at a performance below 40% correct answers in the top 3. In other words, in less than 4 out of 10 queries, the correct result will appear in the top 3 returned search results. Raffle Search has a zero-shot performance of 44% and rises to more than 70% top 3 accuracies with the introduction of training data relevant to the knowledge source.

Said differently, users will find what they are looking for more than twice as often with Raffle Search compared to traditional keyword-based search.

Traditional search companies such as [Algolia](#) and [Elastic](#) have naturally started to include vector search in their offering. While vector search is a useful tool for semantic search, it is essential to note that it is not

sufficient to guarantee optimal performance. Therefore, it is crucial to exercise caution when assuming that implementing vector search alone will automatically result in effective semantic search capabilities.

We have created a challenging internal benchmark with data pooled from many different customers. It is made to test our zero-shot performance: We train models on one set of customers and test the models on data from other customers. The four steps have the following top 3 performances:

1. BERT by itself has a poor performance at 13.1%
2. Supervised fine-tuning on internal data gives 37.4% - barely beating an optimized keyword search algorithm at 36.7%.
3. Question generation brings the performance up to 43.7%.
4. Hybrid search, where vector search is combined with the optimized word-based search, finally brings the performance to 44.8%, which is 8% better than word-based search by itself.

These numbers indicate what the technology delivers without further supervised fine-tuning. Raffle search will always be deployed with a certain amount of fine-tuning so the performance will start at at least 70% top 3 accuracy. In other words, the user will get the correct answer in at least 7 out of 10 queries.

Vector search is still a relatively new technology, and in our experience, commercial offerings are by no means close to the performance of Raffle's solution for two reasons:

1. The vector model is not optimized. It is either a BERT model out of the box or barely fine-tuned. So the vector model is only really useful in a hybrid search solution where the keyword search does the bulk of the work. In Raffle Search, it is the other way around: vector search contributes far most to the ranking, and our keyword search is only used for the very specific situations where the user knows exactly what document is sought.
2. Poor support for further training. Our internal benchmarking shows that a significant boost to top 3 performance up to 70-90% of top 3 accuracies can be achieved by labeling data specific to the customer's knowledge source. The Raffle App provides tools and insights - currently not available in other products - to identify unanswered user questions (clustered knowledge gaps) and the ability to improve data and models.

These are crucial features to probe when considering the vector search solution.

Fast neural networks and vector similarity look-up

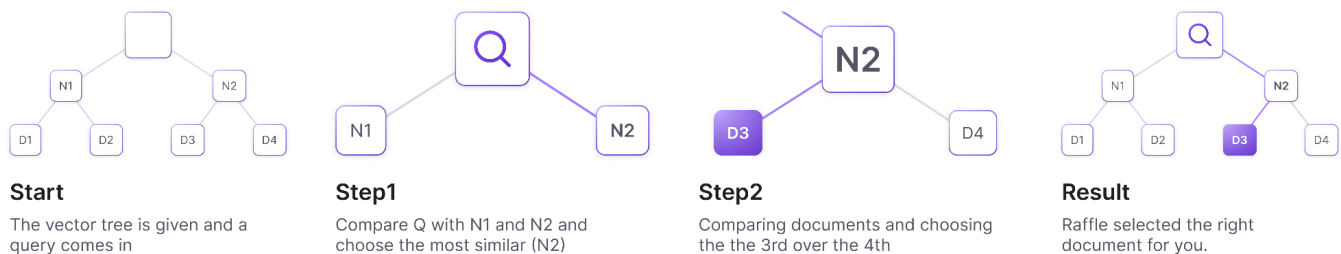
Traditional search excels in fast look-up in the document-term matrix. Luckily, fast methods have also been developed for vector search. This means that vector search can be served in real time even for very large knowledge sources.

A vector index is the set of vectors for all the documents in the knowledge source. A tree structure is built for vectors such that similar vectors are close in the tree. To explain the key concept at a high level, we

can make a tree for our simple example with the four documents. The documents sit as leaves in the tree and we construct additional node vectors sitting inside the tree.

To find the best match to our query, we start at the root of the tree and find the best match among the two children of the root. We keep on doing this until we find the best match as illustrated in the figure. For this small example, we need to perform four vector comparisons to find the best match. This is the same as if we had just matched the query with each of the documents in turn. However, once we go to larger datasets, the difference between going through the tree and going through all the documents one by one will be dramatic: $\log_{2}(D)$ versus D , where D is the number of documents.

The tree structure is the core technology enabling fast retrieval. But that is not all: modern tree-based data structures have many more features than explained above such as real-time tree updating algorithms and approximate top-k retrieval. Raffle employs all of these.



Raffle search versus traditional search

Traditional search engines like Elastic, Solr, Algolia, Asure, Coveo, and Cludo have been the option for many companies needing to manage their content and data search needs. Their search engines operate on keyword-based search, string search, or mixed keyword search algorithms. Keyword-based search engines collect documents based on individual words, while String Search searches across numerous words, which generally form a sentence. A mixed keyword search is when a myriad of keywords are searched that may or may not form a sentence. While these search methods have been effective in the past, their limitations are becoming increasingly evident with the increasing complexity of search queries and data.

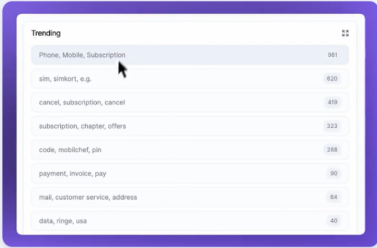
Instead, we now need to combine the best of the two worlds, however with the emphasis and core in the semantic search, as the search will require a much higher level of understanding in general including real conversational AI and AI assistants going forward.

Raffle Insights

Data analytics is essential to gaining deep insights into customers' needs and wants, predicting upcoming trends, and making better, data-driven decisions. Raffle's Behavior Analytics solution helps businesses obtain valuable insights into customers' needs and wants. With Trending Questions, Trending Topics, and Popular Pages and support channel tools, businesses can gain a deep understanding of their customer's preferences and tailor their marketing efforts and customer service accordingly.

Trending Questions

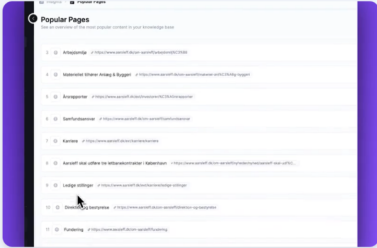
Our Trending questions tool lets you see what's trending in any time frame you choose. It even allows you to drill down to specific search queries. Plus, if you come across any answers that are incorrect, you can let Raffle know so it can fix them next time it trains the model.



Query	Count
Phone, Mobile, Subscription	951
sim, simkort, e.g.	820
cancel, subscription, cancel	439
subscription, chapter, offers	323
code, mobilchat, pin	298
payment, invoice, pay	90
mail, customer service, address	64
data, ringe, usa	40

Popular Pages

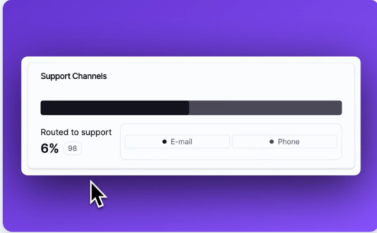
With our Popular Pages feature, you can easily keep track of which pages are getting the most visits from your users. This helps you identify valuable content and prioritize important areas to enhance user engagement and optimize their experience.



Support Channels

With our Support Channels feature, you can effortlessly track the number of customers being routed to your customer service, team while also gaining insights into their preferred communication channels. Learn more about this feature and its benefits here:

[Understand the feature →](#)



Raffle Insights is a valuable tool for businesses, providing real-time data on resolution rates, productivity, time spent, and cost savings. This data helps companies to predict trends and take proactive measures to improve the overall customer journey and interactions within the organization. With the help of this data, businesses can make better, data-driven decisions about their operations, resulting in improved outcomes and competitive advantage.

Site Search | Workplace Search | Extension

All-time Summary

Return on investment

€ 568.704

+ € 124.368 last 31 days

71 % resolution rate

33.191 total sessions

2357 hrs released

+ 515 hrs last 31 days

Support Channels

Routed to support

29% 7249 total

One of the key benefits of Raffles Behavior Analytics is its ability to help businesses identify potential issues with their products or services quickly. For example, suppose customers frequently ask how to install a particular product through the company's customer service portal on their website. In that case, it can indicate an issue with the product's instructions or installation process. By using Raffles Behavior Analytics, businesses can detect such problems in real time and take corrective action promptly, enhancing the customer experience and preventing negative impacts on sales.


Another benefit of Raffles Behavior Analytics is its ability to help businesses identify their website's most popular pages. By analyzing customer behavior, companies can determine which pages generate the most engagement and focus their time and resources on optimizing them to drive more engagement and sales, helping businesses save time and resources while boosting their bottom line.

FILLING THE GAP

Raffle uses a sophisticated clustering algorithm to identify groups of searches that share a joint inquiry, highlighting the most popular and pressing questions. By doing so, it can determine if corresponding answers are already available to these queries and alert your team if there needs to be more information on a specific topic. Raffle identifies these knowledge gaps (Missing information that users need.) and creates temporary answers, allotting businesses the time they need to replace the temporary answers with permanent ones—preventing customers from leaving empty-handed and allowing customer service agents to work more efficiently, saving time and resources and ensuring that information is always up-to-date and accurate for your customers - and in any language.

In English below is an example of 'zero results' with Traditional Search on a search string, as often seen, although the answers are clearly in the data source/index.

Without raffle

Can i attend the annual meeting 

Your search for **Can i attend the annual meeting** gave no results.

With raffle


Can i attend the annual meeting

share-data > shareholder-portal

Shareholder Portal | BankNordik

Registering for the annual general meeting By registering your email address, you will automatically receive the invitation to the annual general meeting by email. It is possible to change your email address at any time by pressing " Contact details " on the front page in shareholder portal and from there update your personal information. Go to the shareholder

The shareholder portal offers investors the option to receive electronic investor news and information on BankNordik such as notices to the general meetings, annual reports and company announcements via email. In addition, the shareholder portal allows investors to receive the admission card by email, appoint a proxy, or submit a vote in connection with the general r

Can i attend the annual meeting 

Your search for **Can i attend the annual meeting** gave no results.

Can i attend the annual meeting

share-data > shareholder-portal

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organisation > investor-og-media-contact

Investor and Media Contact | BankNordik

Shareholder Portal View information regarding your shareholding and receive news and invitations to the Annual General Meeting Learn more

Press Photos Download images of our management, head office and branches. Download press photos here Announcements View or search our archive of investor news and releases. Learn more Financial Reports View BankNordik's quarterly and annual financial reports going back to

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Also, Traditional Search often returns 'zero results' if there are spelling mistakes. Raffle Search does not depend on keywords or tags, and spelling mistakes are therefore no issue.

Without raffle

🔍 Portfolios advise

No Results

🔍 Portfolios advise

Go →

No Results

With raffle

✕ Portfolios advise

emea > en > solutions > asset-managers > data-analytics.html

Data & Analytics for Asset Managers

Customize investment portfolios to individual ESG expectations across user-chosen data sources. Data Analytics leverages crowd-sourced investor behavior to guide investors in the construction of ESG investment portfolios, meeting their individual ESG expectations. Support for dynamic, cross data source, fund products due diligence and selection, investment products ESG demonstrability

A robust approach to complex data challenges. Using all the data that floods into investment firms every day requires significant operational and technical expertise. Meanwhile, bringing that expertise in-house requires substantial commitment and investment—and can expose your firm to risk. With a combination of technological expertise and deep business acumen, our Managed Services can

✕ Portfolios advise

Enter ↵

emea > en > solutions > asset-managers > data-analytics.html



Data & Analytics for Asset Managers

Customize investment portfolios to individual ESG expectations across user-chosen data sources. ESG Data Analytics leverages crowd-sourced investor behavior to guide investors in the construction of ESG investment portfolios, meeting their individual ESG expectations. Support for dynamic, cross data source, fund products due diligence and selection, investment products ESG demonstrability and...

A robust approach to complex data challenges. Using all the data that floods into investment firms every day requires significant operational and technical expertise. Meanwhile, bringing that expertise in-house requires substantial commitment and investment—and can expose your firm to risk. With a combination of technological expertise and deep business acumen, our Managed Services can present...

Where Traditional search sees single words as a keyword and ranks results by the logic of most keyword matches, Raffle sees the intention with single words and translates it into relevant answers.

In other words, single words have intent as well:

Without raffle

About us Investors News & insights Careers Sustainability Our

Search results

Here is what we found...

Showing 20 of 117 results

Jamie Graham

Home » About us » Corporate governance » CEO and leadership team » Jamie Graham
28-09-2021



Nordea appoints new Chief Compliance Officer and new Chief Audit Executive

/en/press/2021-09-01/nordea-appoints-new-chief-compliance-officer-and-new-chief-audit-executive
01-09-2021

Jamie Graham, current Chief Audit Executive, is appointed Chief Compliance Officer and a member of the Group Leadership Team. Virpi Vuorinen, current Head of Group Internal Audit Operations, is appointed Chief Audit Executive.



Audit Report 2010

31-05-2021

About us Investors News & insights Careers Sustainability Our

With raffle

audit

en » about-us » corporate-governance » audit

Audit

Group Internal Audit (GIA) is an independent function commissioned by the Board. The Board Audit Committee (BAC) is responsible for guidance on and evaluation of GIA within the Nordea Group. The Group Chief Audit Executive (CAE) has the overall responsibility for GIA.

GIA, which is the third line of defence, performs audits and provides the Board with an assessment of the overall effectiveness of governance and the risk and control framework, together with an analysis of themes and trends emerging from internal audit work and their impact on the organisation's risk profile.

en » about-us » corporate-governance » board-of-directors » board-work

Board work

Group Internal Audit (GIA) annually provides the Board with an assessment of the overall effectiveness of governance and the risk and control framework, together with an analysis of themes and trends emerging from internal audit work and their impact on the organisation's risk profile.

The Board regularly meets the external auditor and regularly considers the need for such meetings without the presence of the President and Group CEO or any other member of the GLT. In addition, the auditor in charge regularly attends the meetings of the Board Audit Committee. In 2021 the Board of the Company held 16 meetings, 5 of which were held as per capsulam meetings.

en » about-us » corporate-governance » nordea-remuneration-policy

Nordea's Remuneration Policy

Audit of Nordea's Remuneration Policy The BRPC follows up on the application of the Remuneration Policy and supplementary instructions within Nordea through an independent review by Group Internal Audit. This audit is conducted at least annually.

Supporting sound risk management Nordea performs an ongoing risk assessment of remuneration risks conducted within the framework of the Compliance, Conduct and Product Committee (CCPC), the non-financial risk forums of each business area and Group functions as well as the risk and control self-assessment.

en » about-us » supplier-portal » invoicing

Search results

Here is what we found...

Showing 20 of 117 results

Jamie Graham

Home » About us » Corporate governance » CEO and leadership team » Jamie Graham
28-09-2021



Nordea appoints new Chief Compliance Officer and new Chief Audit Executive

/en/press/2021-09-01/nordea-appoints-new-chief-compliance-officer-and-new-chief-audit-executive
01-09-2021

Jamie Graham, current Chief Audit Executive, is appointed Chief Compliance Officer and a member of the Group Leadership Team. Virpi Vuorinen, current Head of Group Internal Audit Operations, is appointed Chief Audit Executive.



PDF, 44.17 KB

Audit Report 2010

31-05-2021

Audit Report 2010
PDF, 44.17 KB



PDF, 58.14 KB

Auditor's Report 2011

31-05-2021

Auditor's Report 2011
PDF, 58.14 KB



PDF, 84.97 KB

Auditor's statement guidelines for remuneration for executive officers 2018

15-03-2018

raffle

audit

en » about-us » corporate-governance » audit

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Group Internal Audit (GIA) is an independent function commissioned by the Board. The Board Audit Committee (BAC) is responsible for guidance on and evaluation of GIA within the Nordea Group. The Group Chief Audit Executive (CAE) has the overall responsibility for GIA.

GIA, which is the third line of defence, performs audits and provides the Board with an assessment of the overall effectiveness of governance and the risk and control framework, together with an analysis of themes and trends emerging from internal audit work and their impact on the organisation's risk profile.

en » about-us » corporate-governance » board-of-directors » board-work

Board work

Group Internal Audit (GIA) annually provides the Board with an assessment of the overall effectiveness of governance and the risk and control framework, together with an analysis of themes and trends emerging from internal audit work and their impact on the organisation's risk profile.

The Board regularly meets the external auditor and regularly considers the need for such meetings without the presence of the President and Group CEO or any other member of the GLT. In addition, the auditor in charge regularly attends the meetings of the Board Audit Committee. In 2021 the Board of the Company held 16 meetings, 5 of which were held as per capsulam meetings.

en » about-us » corporate-governance » nordea-remuneration-policy

Nordea's Remuneration Policy

Audit of Nordea's Remuneration Policy The BRPC follows up on the application of the Remuneration Policy and supplementary instructions within Nordea through an independent review by Group Internal Audit. This audit is conducted at least annually.

Supporting sound risk management Nordea performs an ongoing risk assessment of remuneration risks conducted within the framework of the Compliance, Conduct and Product Committee (CCPC), the non-financial risk forums of each business area and Group functions as well as the risk and control self-assessment.

en » about-us » supplier-portal » invoicing

Invoicing

Such emails are only sent from vendorquery.p@nordea.com mailbox. If you received question regarding such mail please confirm that it is correct. Please be informed that Nordea Bank Abp has authorized Transparent Solutions B.V. to perform an audit of the accounts payable operations of Nordea Bank Abp and its affiliates. For the purpose of this audit, Transparent Solutions B.V. will request invoices statements to multiple Nordea suppliers.

en » about-us » nordea-in-socially » three-lines-of-defence

Powered by raffle

Below is an example in Italian, where the Traditional Search on the current website cannot find the right answer:

All Rights Reserved | raffle.ai

https://raffle.ai | hello@raffle.ai | VAT no.: DK39747189

US: +1 929-207-4717 | UK: +44 20 3966 5755 | Benelux: +31 202442319 | Nordics: +45 4290 9050

Without raffle

The screenshot shows a search results page for the query "Posso dividere la mia bolletta?". The header is a red bar with the Enel logo and a search icon. Below the header, the search query is displayed in large white text on a red background, with "4 RISULTATI DI RICERCA" underneath. A navigation bar contains "MOSTRA FILTRI" and "ORDINA PER: PIÙ RECENTE". The search results are listed below, with the top result featuring a photo of a family and the title "Scopri Bolletta Web".

enel

Q Posso dividere la mia bolletta?
4 RISULTATI DI RICERCA

MOSTRA FILTRI ORDINA PER: PIÙ RECENTE

BOLLETTA | BOLLETTA | agosto 31, 2022
Scopri Bolletta Web
La soluzione sostenibile, comoda e gratuita

BOLLETTA | BOLLETTA | luglio 09, 2020
Bolletta Enel Energia: domande e risposte

With raffle

The screenshot shows the same search results page as the "Without raffle" version, but with a "Raffle" overlay. The overlay is a semi-transparent white box with a search bar and a "Raffle" button. The search results are visible through the overlay, but the "Raffle" button is highlighted, indicating that the search results are being filtered or ranked based on the Raffle score.

Posso dividere la mia bolletta?

it > supporto > faq > rateizzazione-della-bolletta

Rateizzazione bolletta gas e luce | Enel Energia
Se non rispetti la scadenza delle rate , il tuo piano sarà annullato; in tal caso dovrai pagare in un'unica soluzione l'importo residuo maggiorato degli eventuali interessi maturati. Domande frequenti Un piano di rateizzazione o piano di rientro, ti permette di dividere in "rate" il pagamento di una o più bollette.

News Rateizzazione della bolletta posizione attuale Rateizzazione della bolletta Enel Energia Scopri le nostre soluzioni per suddividere il pagamento delle bollette

it > supporto > faq > canone-rai

Canone RAI in Bolletta: come funziona | Enel Energia
L'importo di 90€ verrà suddiviso in 10 rate da 9€ nelle bollette della luce da gennaio a ottobre . L'addebito varierà in funzione della frequenza di fatturazione della bolletta di energia elettrica, ovvero:

Puoi verificare se la tua utenza è "domestica" sulla prima pagina della bolletta, nella sezione Dati Fornitura alla voce "Tipologia cliente", troverai la dicitura "domestico residente".

This screenshot is identical to the "Without raffle" version, showing the search results for "Posso dividere la mia bolletta?" on the Enel website.

enel

Q Posso dividere la mia bolletta?
4 RISULTATI DI RICERCA

MOSTRA FILTRI ORDINA PER: PIÙ RECENTE

BOLLETTA | BOLLETTA | agosto 31, 2022
Scopri Bolletta Web
La soluzione sostenibile, comoda e gratuita

BOLLETTA | BOLLETTA | luglio 09, 2020
Bolletta Enel Energia: domande e risposte

This screenshot is identical to the "With raffle" version, showing the search results for "Posso dividere la mia bolletta?" on the Enel website with the Raffle overlay.

Posso dividere la mia bolletta?

it > supporto > faq > rateizzazione-della-bolletta

Rateizzazione bolletta gas e luce | Enel Energia
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it > supporto > faq > iscrizioni-programma-fedelta

Enel Energia per le aziende: un canale per ogni esigenza
Il programma fedeltà è strutturato in ti Powered by raffle >ortunità per i clienti. La prima

And then with a large company from Finland. Single word search on Traditional Search on the left side that cannot find the right answers, and Raffle on the right side finding the right answers out of the box:


Without raffle


🔍 🗣️ 🏠 ☰


Haku

🔍

PALVELUT

 **Tarjouspyyntö vakuutuksista**
Pyydä meiltä vakuutustarjous vaivattomasti verkossa. Vakuutusten tarjouspyyntö on vaivatonta täyttää eikä se sido sinua vielä mihinkään. Tutustu ja lähetä!


 **Vakuutukset**
Pohjola Vakuutus on suomalainen vakuutusyhtiö – löydät meiltä vakuutukset kaikkiin tarpeisiin. Osta tarvitsemasi vakuutukset verkosta tai pyydä tarjous!

🔍 🗣️ 🏠 ☰

Haku


🔍

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With raffle

🔍 🗣️ 🏠 ☰

Autovakuutus

yritykset • vakuutukset • ajoneuvo- ja kuljetusvakuutukset • ajoneuvovakuutus

Autovakuutus yritykselle ja yritysajoneuvojen vakuutukset


Mitä yrityksen autovakuutus sisältää? Henkilö- ja pakettiautoille tarjoamme seuraavia vakuutusturvia:

Pyydä tarjous netistä ja saat hinnan Käymme mielellämme vakuutustarpeesi läpi ja autamme valitsemaan sopivan autovakuutuksen yrityksellesi. Jätä yhteystietosi alla olevan tarjouspyynnön kautta ja kerromme lisää! Yritysajoneuvo ulkomaille

yritykset • rahoitus • investoinnit

Yrityksen investointien rahoitus

Käyttöomaisuuspalvelu Kun olet suunnittelemassa yrityksesi tietotekniikka- tai kalustehankintoja. Ajoneuvohankinnat rahoitusta vaille? Kun yrityksesi on hankkimassa ajoneuvoja, kysy meiltä vaihtoehtoja leasing- tai osamaksurahoitukseen. Autoleasing – huoleton valinta autoiluun Katso kaikki OP:n autoleasing-ratkaisut ja vertaile keskenään.

🔍 🗣️ 🏠 ☰

Autovakuutus

yritykset • vakuutukset • ajoneuvo- ja kuljetusvakuutukset • ajoneuvovakuutus

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yritykset • rahoitus • investoinnit

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yritykset • vakuutukset • toiminnan-vakuutukset • vastuuvakuutus • toiminnan-vastuuvakuutus

Toiminnan vastuuvakuutus yritykselle

Esinevahinkoa voi olla esimerkiksi auton vaurioituminen, joltain korvaamme sen korjauskulut. Samoin, jos esimerkiksi LVI-asiintajan huolimattoman työn seurauksena syntyy vesivahinko asiakkaan tiloihin, korvaamme asiakkaalle koituneen vahingon eli kiinteistön korjauskulut. Henkilövahinkona voidaan puolestaan korvata lükustamisesta aiheutuneen rannemurtuman hoitokuluja ja ansionmenetyksiä. Vahingon sattuessa saat tukeksi Pohjola Vakuutuksen ammattilaiset...

yritykset • vakuutukset • asiointi • yrityksen-vakuutukset-ja-laskutus

Yrityksen vakuutukset ja laskutus

Esimerkki 2. Koontilaskutuksesi on 1 erässä ja olet jo maksanut laskun, eli ajoneuvojesi veloitukset ovat maksettu koko vakuutuskaudeksi. Ajoneuvosi turvan vakuutusmaksu on 500 euroa. Myyt ajoneuvon, joltain turvan veloitukseksi vakuutuskaudelta lää 440 euroa, jöten muodostuu hyvä **raffle** 0 euroa – 440 euroa). Koska olet maksanut

Below with a large Swedish company on a search string. Raffle on the right side giving the right answer out of the box. Whereas on the left side the answers have nothing to do with the search applied.

Without raffle

skandia:

SPARA & PENSION LÅNA FÖRSÄKRING VARDAGSTJÄNSTER KUNDSERVICE OM OSS

Q | Jag hat tappat mitt kreditkort

Sökresultat Visar 318 resultat från våra privatsidor.

En påse pengar

OM OSS

Hur maxar jag mitt sparande? Hur skapar jag den perfekta portföljen? Detta och mycket mer besvaras i podden "En påse pengar"

Psykologens råd i oroliga tider

OM OSS

Nu klassificeras Coronaviruset som en pandemi av Världshälsoorganisationen (WHO). Oron för virusets ekonomiska effekter får världens börser att svänga kraftigt – och samtidigt blir frågorna också allt fler. Hur ska jag tänka för att må lite bättre mitt i all ovisshet?

skandia:

Privat

SPARA & PENSION LÅNA FÖRSÄKRING VARDAGSTJÄNSTER KUNDSERVICE OM OSS

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Okända knepet som kan lyfta din pension

OM OSS

Hur kan jag komma igång och växa upp mitt pensionssparande? Som dessutom består långt mycket längre än året ut. Katharina Paoli, ordförande i Nudging Sweden och vd för Nudge, ger sina bästa tips. – Vår inbyggda latmask är väldigt stark och kan behöva en vänlig knuff ibland, säger hon.

With raffle

Privat

X Jag hat tappat mitt kreditkort

kontakta-skandia » sparra-kort

Spärra kort | Dygnet runt

Spärra ditt kort +46-771-33 20 00 Om du förlorar ditt kort eller misstänker att någon annan fått kännedom om din pinkod ska du or 50 00 Om du är ansluten till spårsservice via Stopservice (tidigare Falck Secure Spårsservice) hjälper de dig att spärra dina värdehar

vardagstjänster » konton-kort » vilket-kort-passar-dig

Vilket bankkort passar dig? | Jämför våra kort

Visa Bankkort online För ungdomar (fr.o.m. 9 år), fungerar för köp i butiker som är kopplade online och i uttagsautomater i hela v butiker och uttagsautomater i hela världen. Ansök Läs mer Visa Kreditkort Fungerar för både köp och uttag mot faktura i hela vär

Med kort handlar du tryggt och säkert Möjlighet till mobila betalningar via Apple Pay eller Samsung Pay Vi bjuder på Bank- eller K Vardagspaketet

Sparande, försäkring & bolån | Skandia

Vanliga frågor just nu PIN-kod Den personliga PIN-koden består av 4 siffror och den skickas till dig i ett rekommenderat brev till dir första användning uppmanas du att byta den till 4 siffror som du väljer själv. Har du glömt din personliga PIN-kod kan du ringa kun koden används när du: Ringer telefonbanken och kundservice Hämtar ett BankID, Mobil BankID eller ett certifikat Loggar in med ci tecken som du kan få på SMS eller på ett kodkort. Väljer du att få koden via SMS får du den snabbast. Vi skickar koden till det mob

X Jag hat tappat mitt kreditkort

kontakta-skandia » sparra-kort

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In Dutch with a large company from Holland (The Netherlands). The single word that is not understood by the traditional search because the word was not tagged. Raffle, however, understands the intent of the word and can find the right answers on day one.

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US: +1 929-207-4717 | UK: +44 20 3966 5755 | Benelux: +31 202442319 | Nordics: +45 4290 9050

Without raffle



NHL STENDEN hogeschool

Waar ben je naar op zoek?

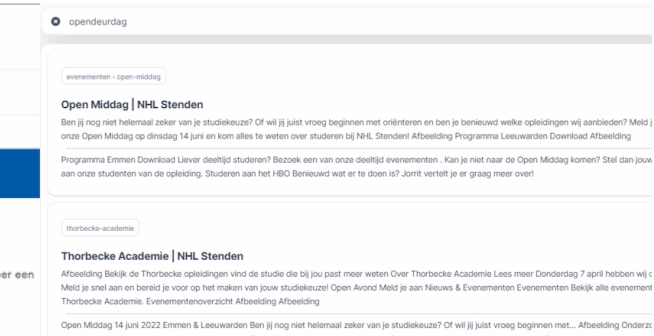
opendeurdag

Verfijn je resultaat: - Alle resultaten -

0 resultaten gevonden

Je zoekopdracht heeft geen resultaten opgeleverd. Controleer de spelling of probeer een ander zoekwoord.

With raffle



opendeurdag

evenementen - open-middag

Open Middag | NHL Stenden

Ben jij nog niet helemaal zeker van je studiekeuze? Of wil jij juist vroeg beginnen met oriënteren en ben je benieuwd welke opleidingen wij aanbieden? Meld je aan voor onze Open Middag op dinsdag 14 juni en kom alles te weten over studeren bij NHL Stenden! Afbeelding Programma Leeuwarden Download Afbeelding

Programma Emmen Download Liever doeltijd studeren? Bezoek een van onze doeltijd evenementen. Kan je niet naar de Open Middag komen? Stel dan jouw aan onze studenten van de opleiding. Studeren aan het HBO Bnieuw wat er te doen is? Jorrit vertelt je er graag meer over!

thorbecke-academie

Thorbecke Academie | NHL Stenden

Afbeelding Bekijk de Thorbecke opleidingen vind de studie die bij jou past meer weten Over Thorbecke Academie Lees meer Donderdag 7 april hebben wij c Meld je snel aan en bereid je voor op het maken van jouw studiekeuze! Open Avond Meld je aan Nieuws & Evenementen Evenementen Bekijk alle evenement Thorbecke Academie. Evenementenoverzicht Afbeelding Afbeelding

Open Middag 14 juni 2022 Emmen & Leeuwarden Ben jij nog niet helemaal zeker van je studiekeuze? Of wil jij juist vroeg beginnen met... Afbeelding Onderz



NHL STENDEN hogeschool

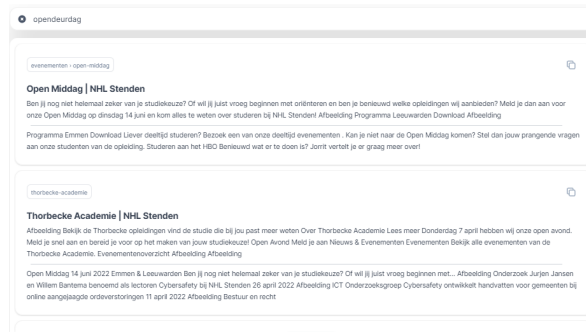
Waar ben je naar op zoek?

opendeurdag

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opendeurdag

evenementen - open-middag

Open Middag | NHL Stenden

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Open Middag 14 juni 2022 Emmen & Leeuwarden Ben jij nog niet helemaal zeker van je studiekeuze? Of wil jij juist vroeg beginnen met... Afbeelding Onderzoek Jurgen Jansen en Willem Barntema benoemd als lectoren Cybersafety bij NHL Stenden 26 april 2022 Afbeelding ICT Onderzoeksgroep Cybersafety ontwikkelt handvatten voor gemeenten bij online aangelegde orbevenstronngen 11 april 2022 Afbeelding Bestuur en recht

Any language in the world goes with Raffle Search because of its origin and core in vectors and semantics.

By analyzing inquiries externally and internally, Raffle optimizes your website, allowing customers to flow naturally through the customer acquisition funnel, ultimately reducing customer churn and giving businesses a competitive edge in today's marketplace.

Conclusion

In conclusion, Raffle Search's hybrid search technology has revolutionized search experiences by utilizing vector search technology, which maps documents and queries to vectors using large language models neural network, reflecting the intent and semantics of the content, providing highly accurate and personalized search results.

As we progress into the future, the importance of AI search will only increase. However, it is crucial to recognize that the foundation of its success is its sustainability and accuracy in producing relevant data. Without this, even the most advanced AI models like GPT will fail to deliver the desired outcomes. An issue we delve into deeper in our following insights papers.