How Machine Learning
is used in LinkedIn Recruiter

RECOMMENDATION SYSTEMS

(Overview + Architecture)





...is nailing the recruitment game!

Primary reason LinkedIn users are active on the platforms is for job **recruitment** efforts. With more than **20 million companies** listed on the site and **14 million open jobs**, it's no surprise to find out that **90% of recruiters** regularly use LinkedIn.

In fact, a study found that **122 million** people received an interview through LinkedIn, with **35.5 million** having been hired by a person they connected with on the site.

@ML.INDIA

Heavy usage of ML and DS.

In addition to nurturing one of the richest datasets in the world, LinkedIn has been constantly experimenting with **cutting edge machine learning** techniques and pushing the boundaries of research and development.

@ML.INDIA

Recruiter recommendation:

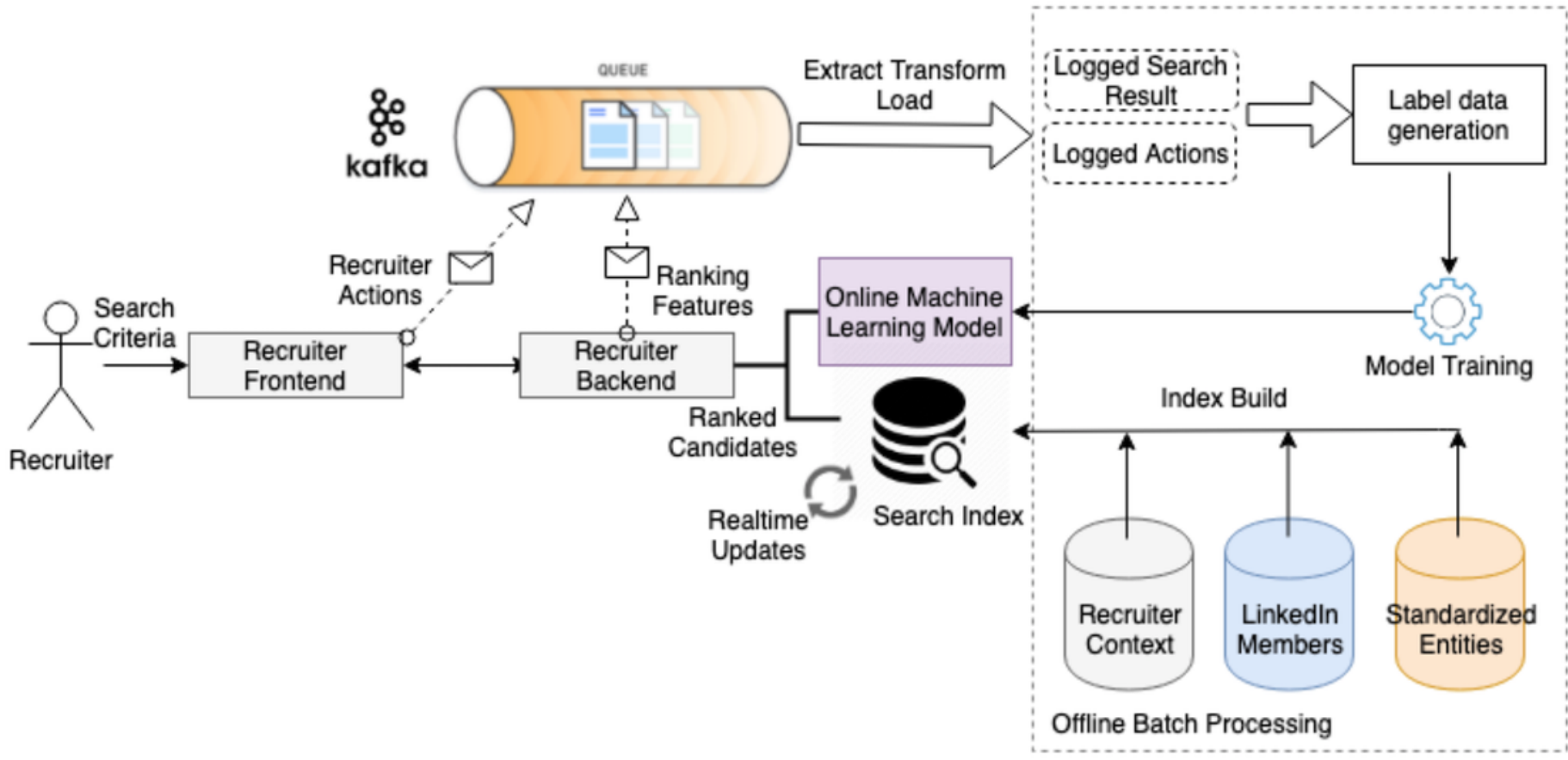
Specifically, **LinkedIn Recruiter** is the product that helps recruiters build and manage a talent pool that optimizes the chances of a successful hire.

This product by LinkedIn needs to handle arbitrarily **complex queries** and **filters** and deliver results that are relevant to a specific **criteria**. Read more about the criteria in our caption. ▼

The architecture:

The LinkedIn Recruiter search and recommendation experience is based on a proprietary project called **Galene** built on top of the **Lucene** search stack.

@ML.INDIA



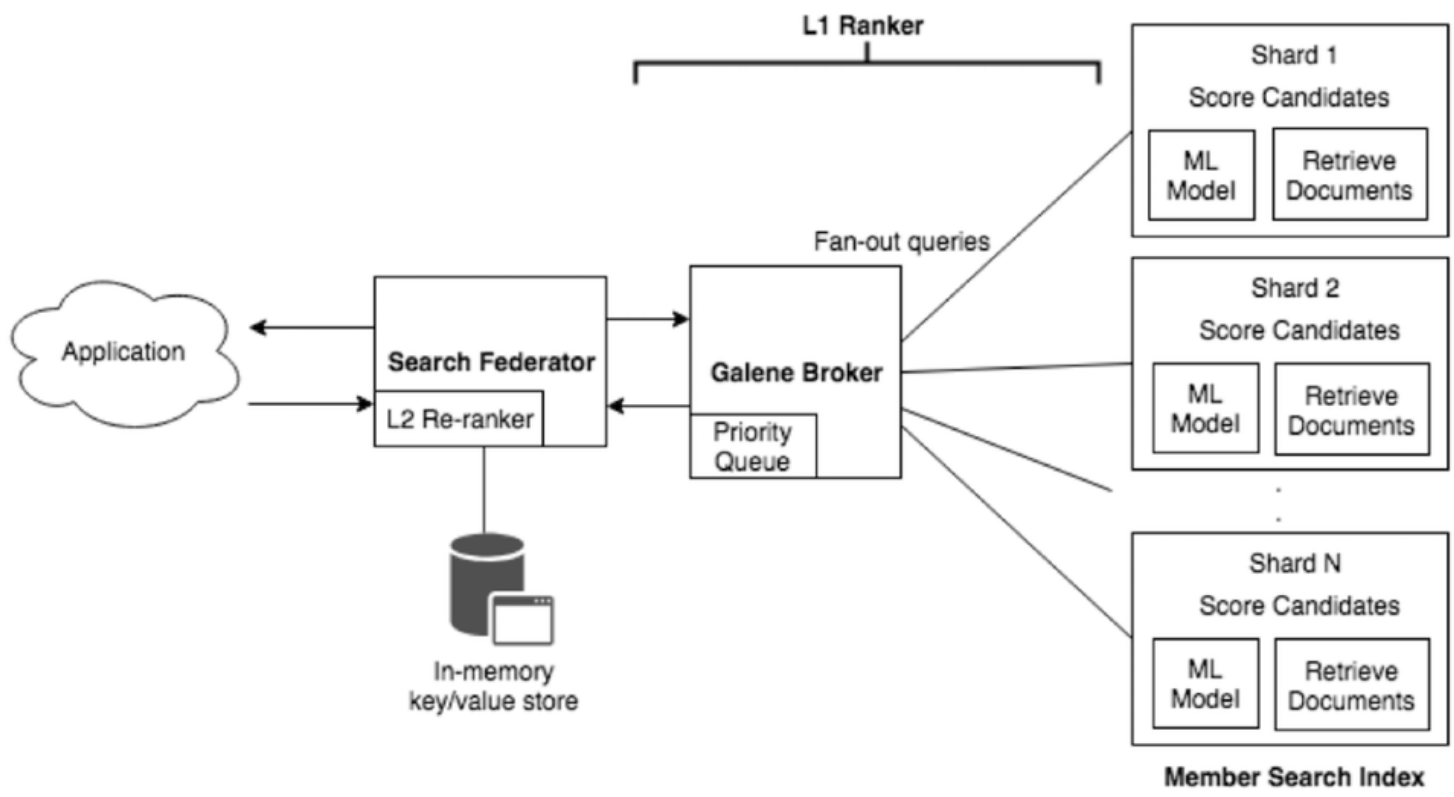
Source: https://engineering.linkedin.com/blog/2019/04/ai-behind-linkedin-recruiter-search-and-recommendation-systems

The ranking model...

... of the Recruiter Search experience is based on an architecture with two fundamental layers.

@ML.INDIA

- **L1:** Scoops into the talent pool and ranks candidates. In this layer, candidate retrieval and ranking are done in a distributed fashion.
- **L2:** Refines the short-listed talent to apply more dynamic features using external caches.



Source: https://engineering.linkedin.com/blog/2019/04/ai-behind-linkedin-recruiter-search-and-recommendation-systems

The details:

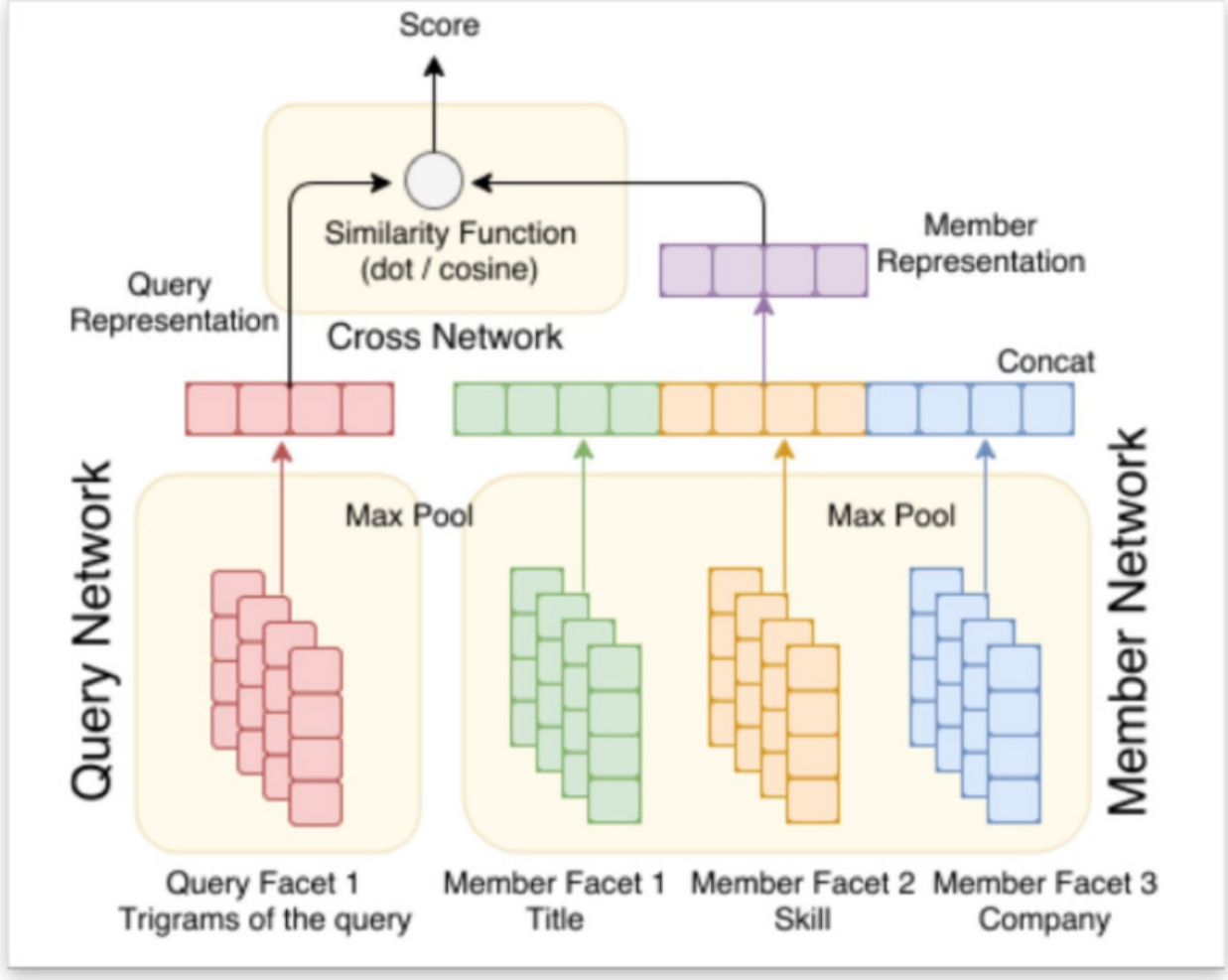
- In that architecture, the **Galene** broker system fans out the search query request to multiple search index partitions.
- Each partition retrieves the matched documents and applies the **machine learning model** to retrieved candidates.
- Each partition **ranks** a subset of candidates, then the broker gathers the ranked candidates and returns them to the federator.
- The **federator** further ranks the retrieved candidates using additional ranking features and the results are delivered to the application.

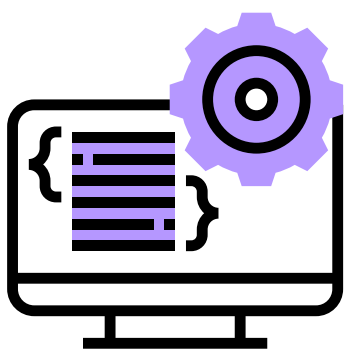
@ML.INDIA

Are you a good fit?

LinkedIn Recruiter experienced the challenge to match candidates with related titles such as “Data Scientist” and “ML Engineer”. This type of **correlation** is hard to achieve. So, they introduced representation learning techniques based on **network embedding semantic similarity features**. Here's how the calculate the score/rank of candidates:

@ML.INDIA





ML methodologies they use:

@ML.INDIA

- Non-linear modeling with Gradient Boosted Decision Trees.
- Context-aware ranking with pairwise learning-to-rank.
- Deep and representation learning.
- Large-Scale Information Network Embeddings.
- Entity-level personalization with GLMix (Generalized Linear Mixed (GLMix) models).



Content curator:

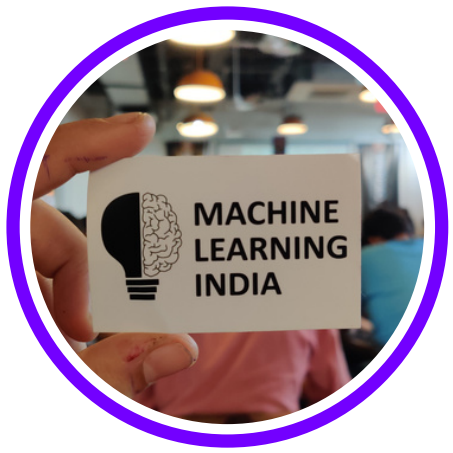
Priyanka Kasture.

Notable references:

- The AI Behind LinkedIn Recruiter search and recommendation systems: **engineering.linkedin.com**.
- How LinkedIn Uses ML in Recruiter Recommendation Systems: **Jesus Rodriguez, KDNuggets**.

Important note:

The links to these resources will be put up on our Telegram. Channel ID: **@machinelearning24x7**.



@ml.india

@ml_india_

bit.ly/mli-linkedin

@machinelearning24x7

Find our content valuable?

Show your support by following us, sharing our content and commenting below! A **HUGE** shout-out to **Aashay sharma**, our patron, for making this post possible. ♥

Become a **patron** on: patreon.com/machinelearningindia

Link in bio!

Like. **Comment.** **Share.**