MyGene.info

- Making Elastic Gene API

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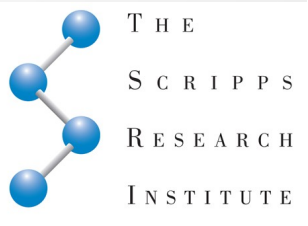
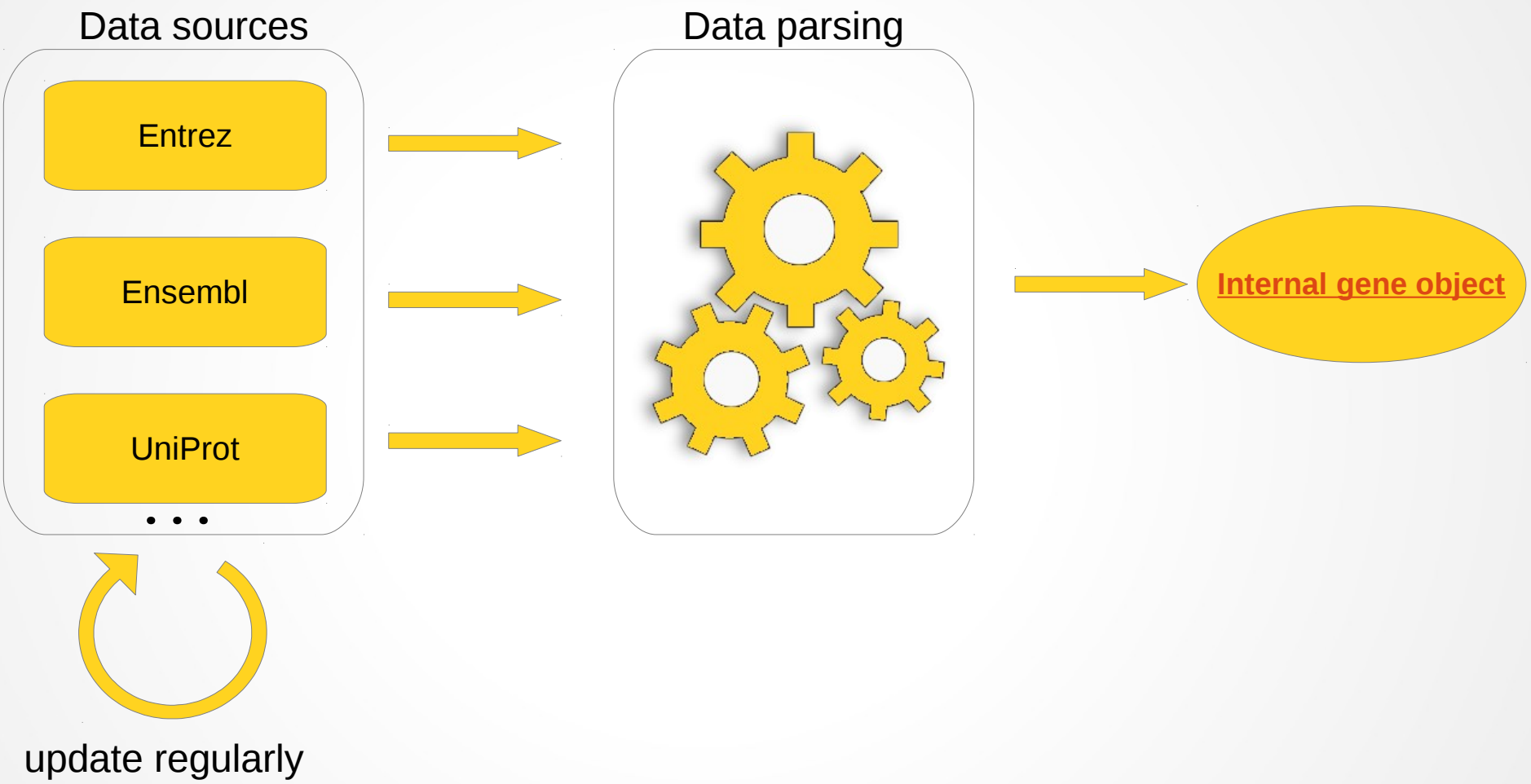


Being “Elastic“

- Fast
- Always ON
- Up-to-date
- Scalable
- Extensible

Common procedure for gene data retrieval



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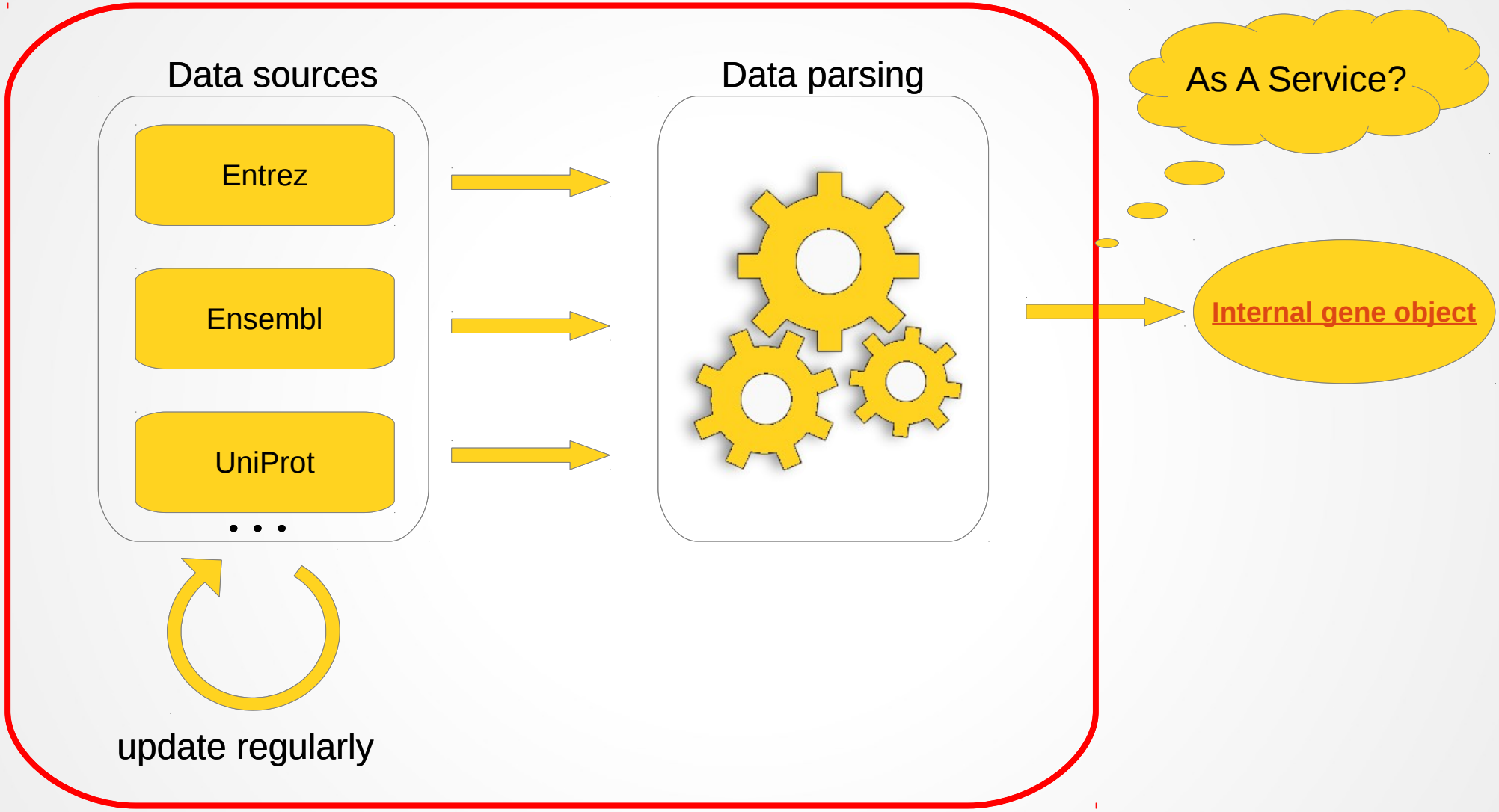
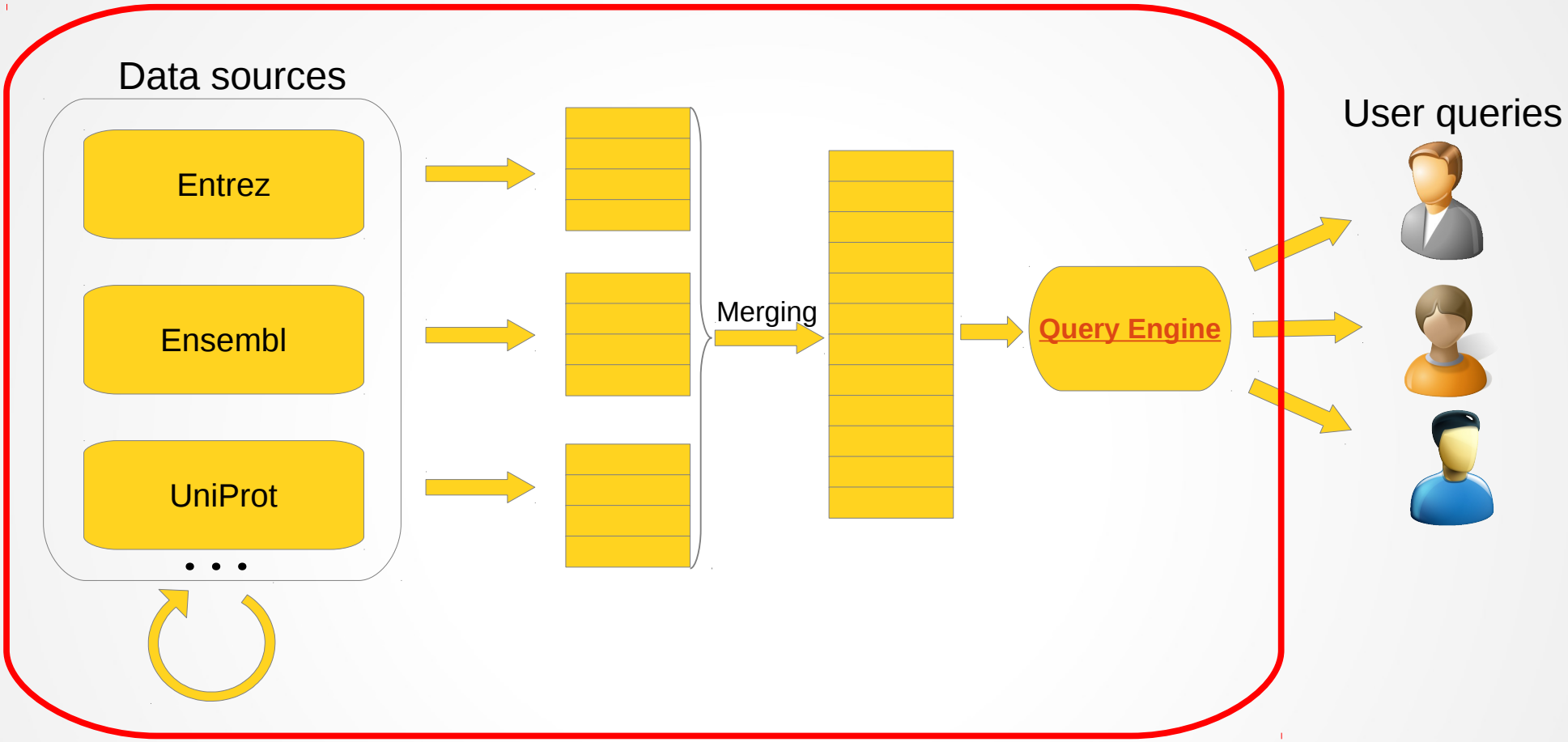
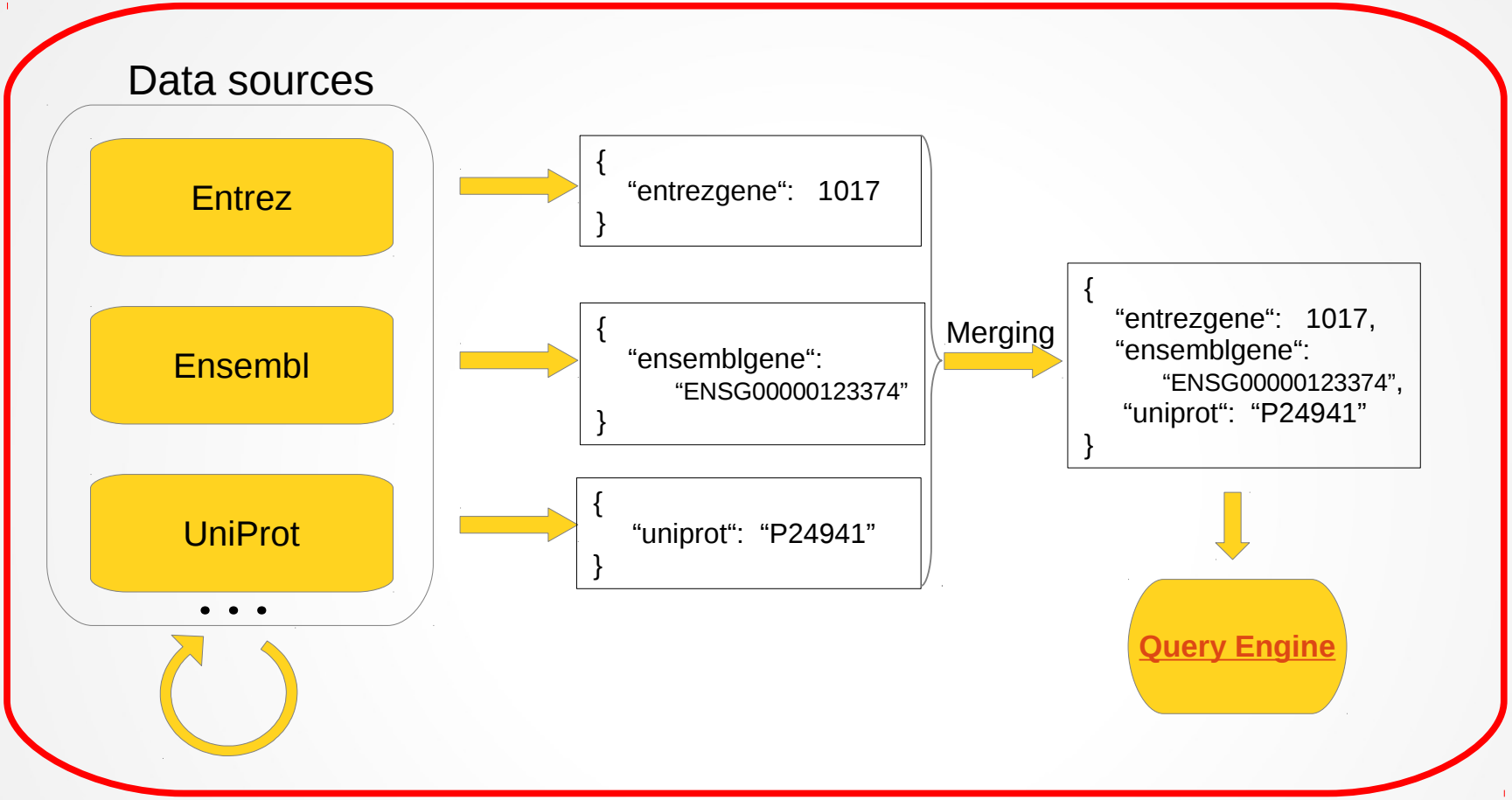


Working model - 1



Working model - 1

A dummy merging example:



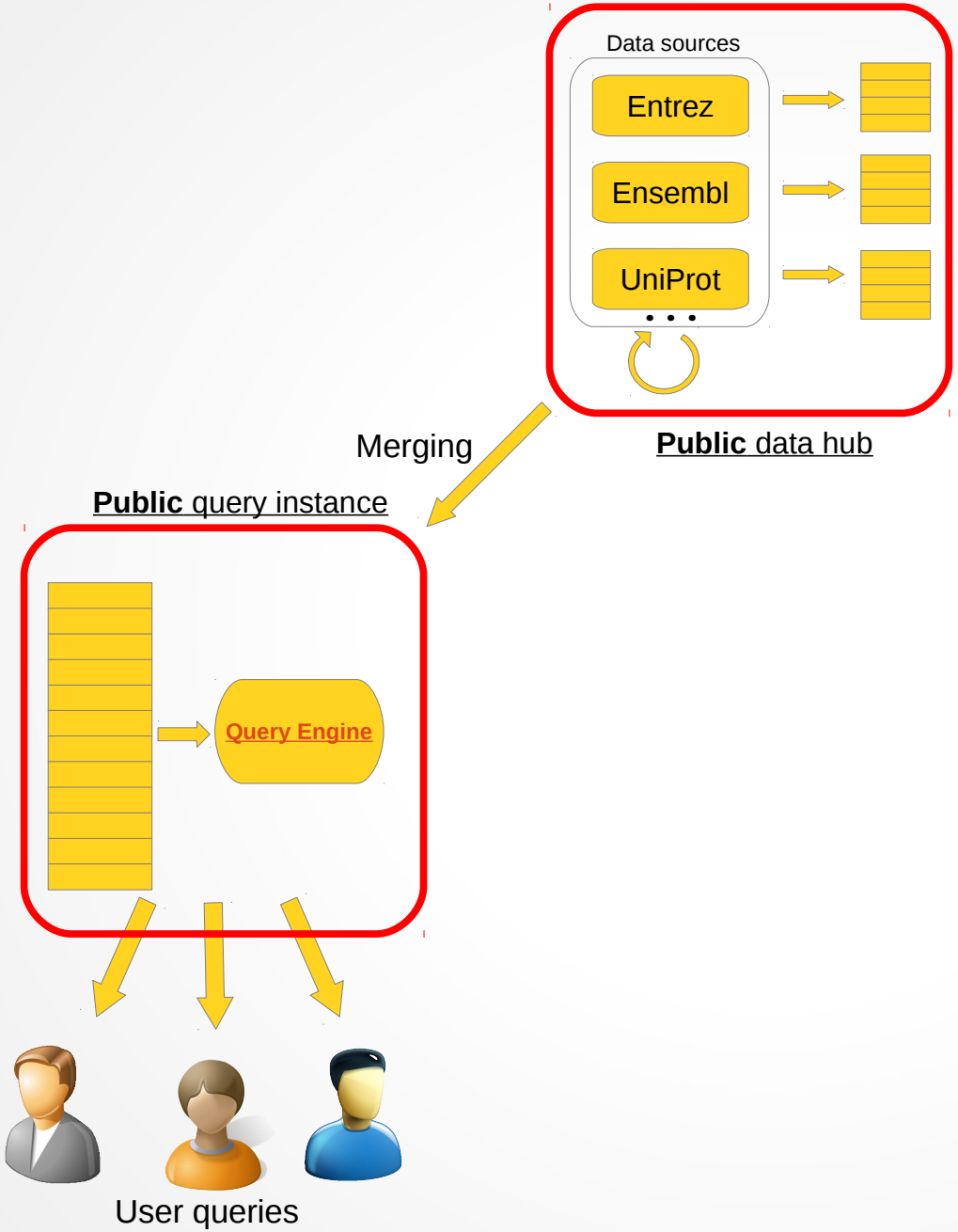
Gene object in noSQL database

“key” “document”

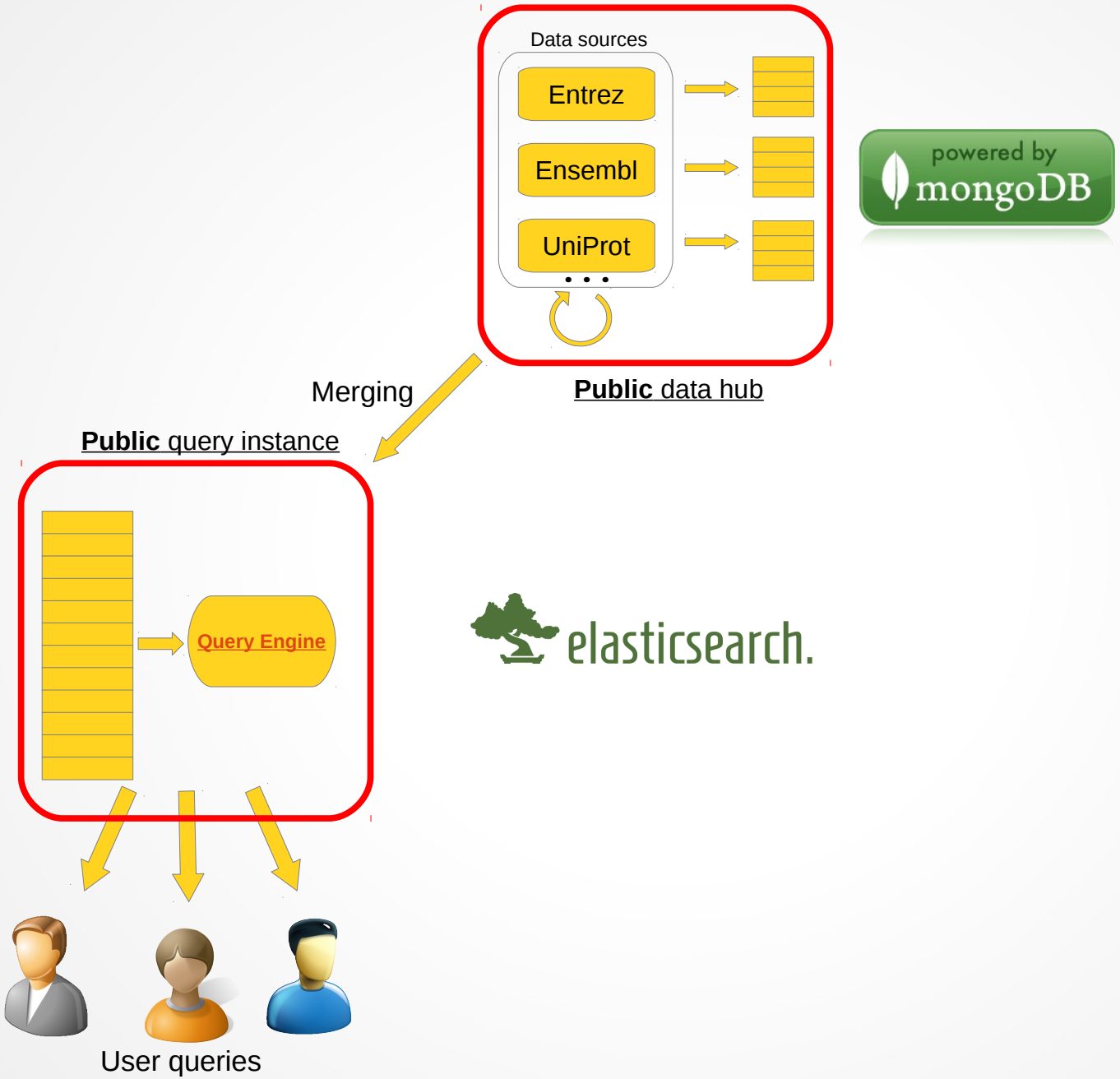
1017:

```
{
      “Symbol”:  “CDK2”,
      “Ensembl”: “ENSG00000123374”,
      “RefSeq”:   [
            “NM_001798”,
            “NM_052827”
      ],
      “Reporter”: {
          “U95A”: [
             “1792_g_at”,
             “1833_at”
          ],
          “U133A”:[
             “211804_s_at”,
             “2045252_at”,
             “211803_at”
          ]
       }
}
```

Syncing from data-hub to query instance



Syncing from data-hub to query instances



powered by mongoDB

elasticsearch.

Public query instance

http://MyGene.info

(currently v2 API, two endpoints)

any query term(s)

↓

http://MyGene.info/v2/query?q=<query>

↓

matching gene hits

gene id(s)

↓

http://MyGene.info/v2/gene/<geneid>

↓

matching gene objects

Public query instance

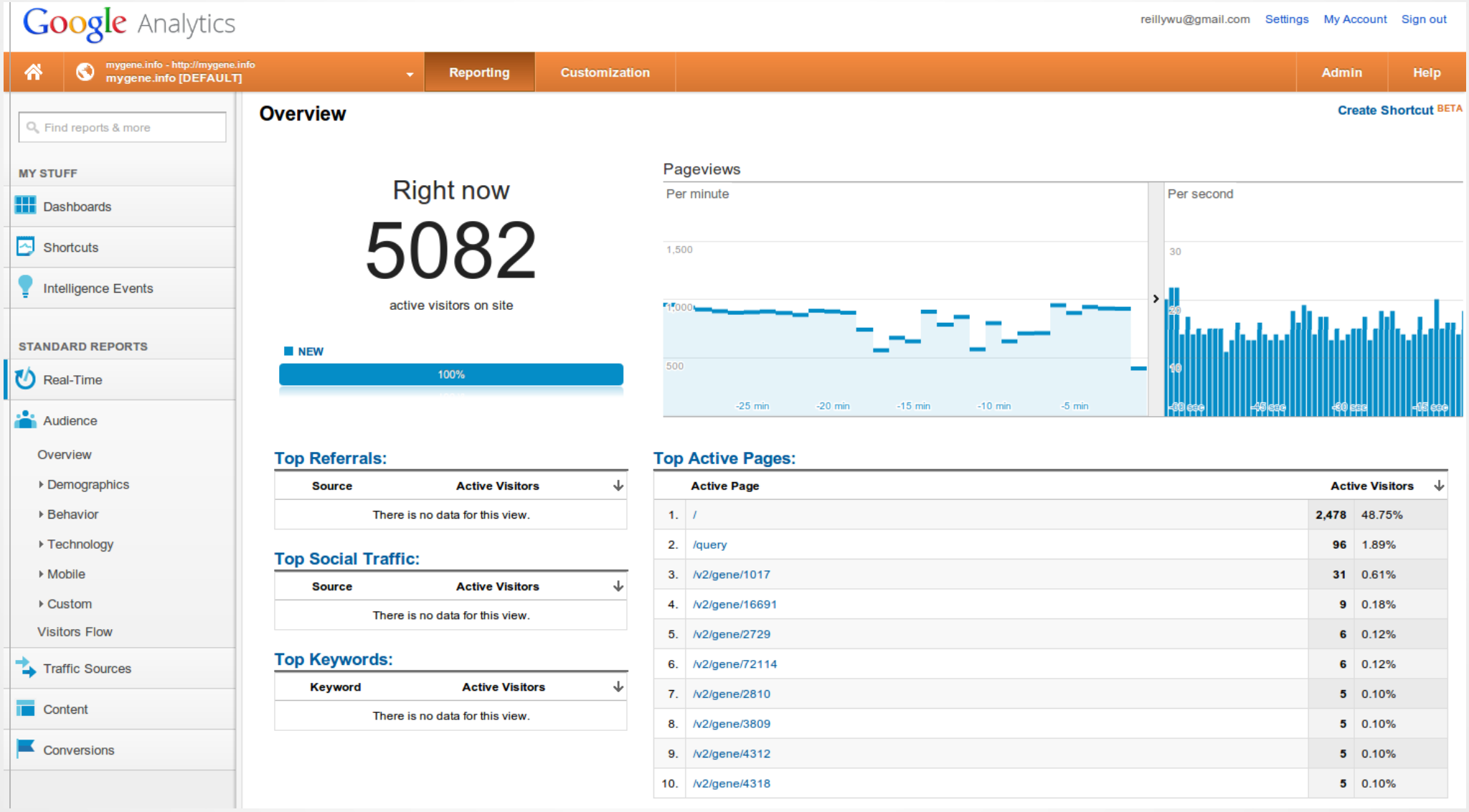
http://MyGene.info

- Support ALL species, from NCBI (>12K species, >13M genes)
- >40 annotation fields and expanding
- Weekly-updated
- Flexible query interface
  - Simple queries — *?q=cdk2*
  - Fielded queries — *?q=symbol:cdk2*
  - Wildcard queries — *?q=cdk**
  - Genomic interval queries — *?q=chr1:1-100,000&species=human*
  - Species filter — *?q=cdk2&species=mouse,rat*
  - Returning fields filter — *?q=cdk2&fields=symbol,homologene*
- Support batch queries, JSONP, CORS
- Committed for long-term availability

Public query instance

http://MyGene.info

High-performance host (serving ~500K requests/day)



Public query instance

Third-party packages

MyGene.py - Python wrapper

https://pypi.python.org/pypi/mygene

```
pip install mygene
```

```
In [1]: import mygene
In [2]: mg = mygene.MyGeneInfo()
In [3]: mg.getgene(1017)
Out[3]:
{'_id': '1017', 'entrezgene': 1017, 'name': 'cyclin-dependent kinase 2',...}
In [4]: mg.query('cdk2')
Out[4]:
{'hits': [{'_id': '1017',
   '_score': 373.24667,
   'entrezgene': 1017,
   'name': 'cyclin-dependent kinase 2',
   'symbol': 'CDK2',
   'taxid': 9606},
   ...],
 'max_score': 373.24667,
 'took': 10,
 'total': 28}
```

Public query instance

Third-party packages

MyGene.autocomplete

- Gene query autocomplete widget

https://bitbucket.org/sulab/mygene.autocomplete

```
$('input.mygene_query_target').genequery_autocomplete({
    "species": "human,mouse,rat",
    "limit": 10,
    "gene_label": "{symbol}: {name} ({species})",
    "select": function(event, ui) {
        alert( ui.item ?
               "Selected: " + ui.item.label + '('+ui.item._id+')':
               "Nothing selected, input was " + this.value);
    }
});
```

Public query instance

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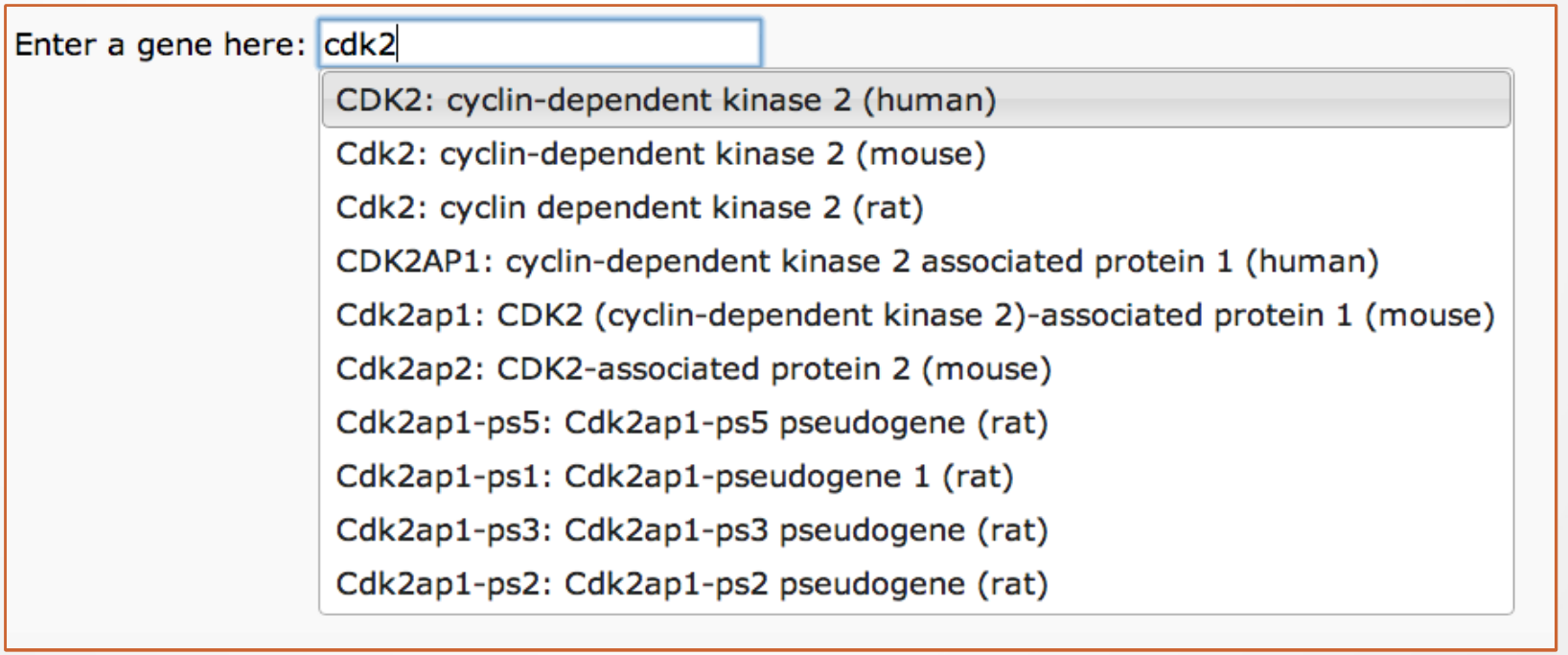
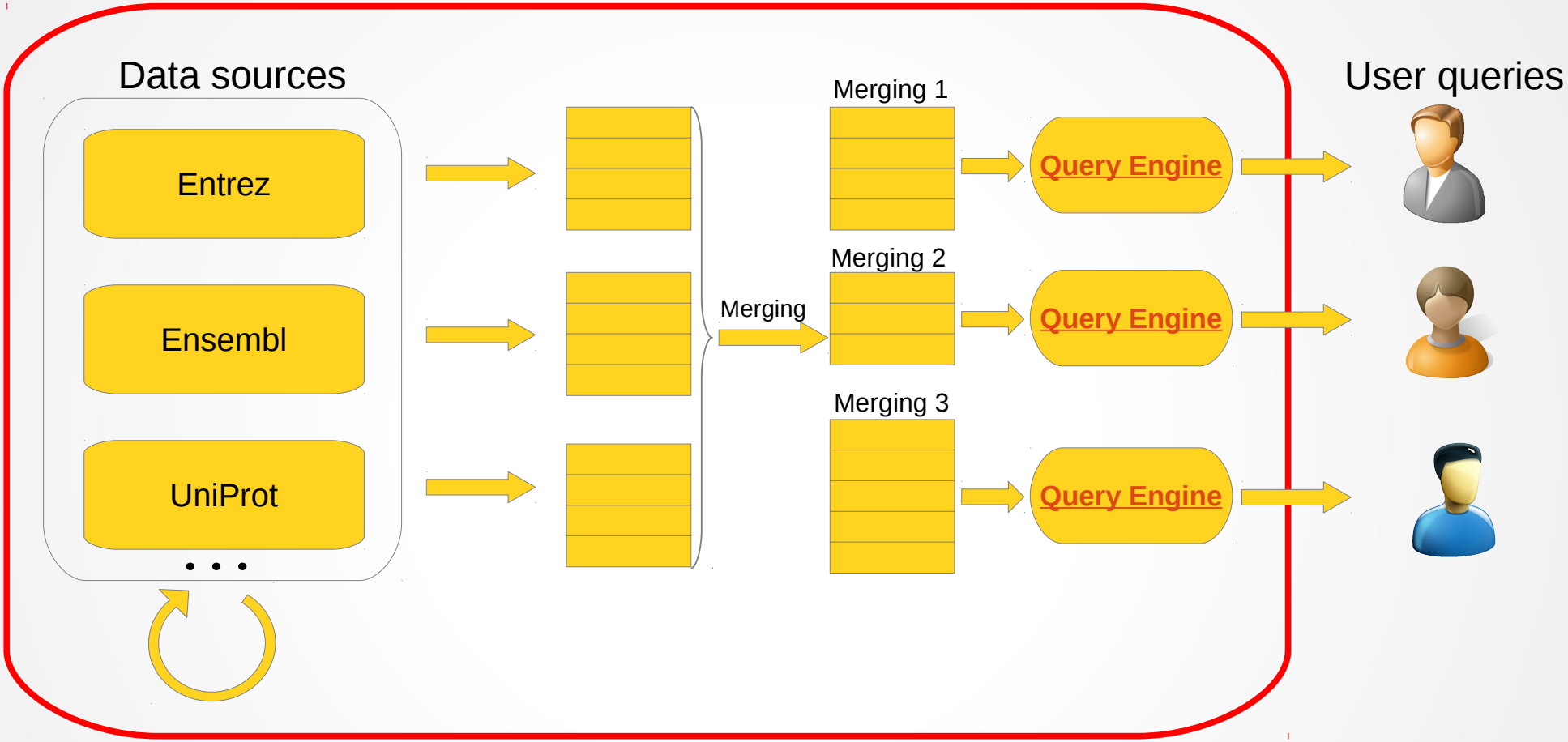
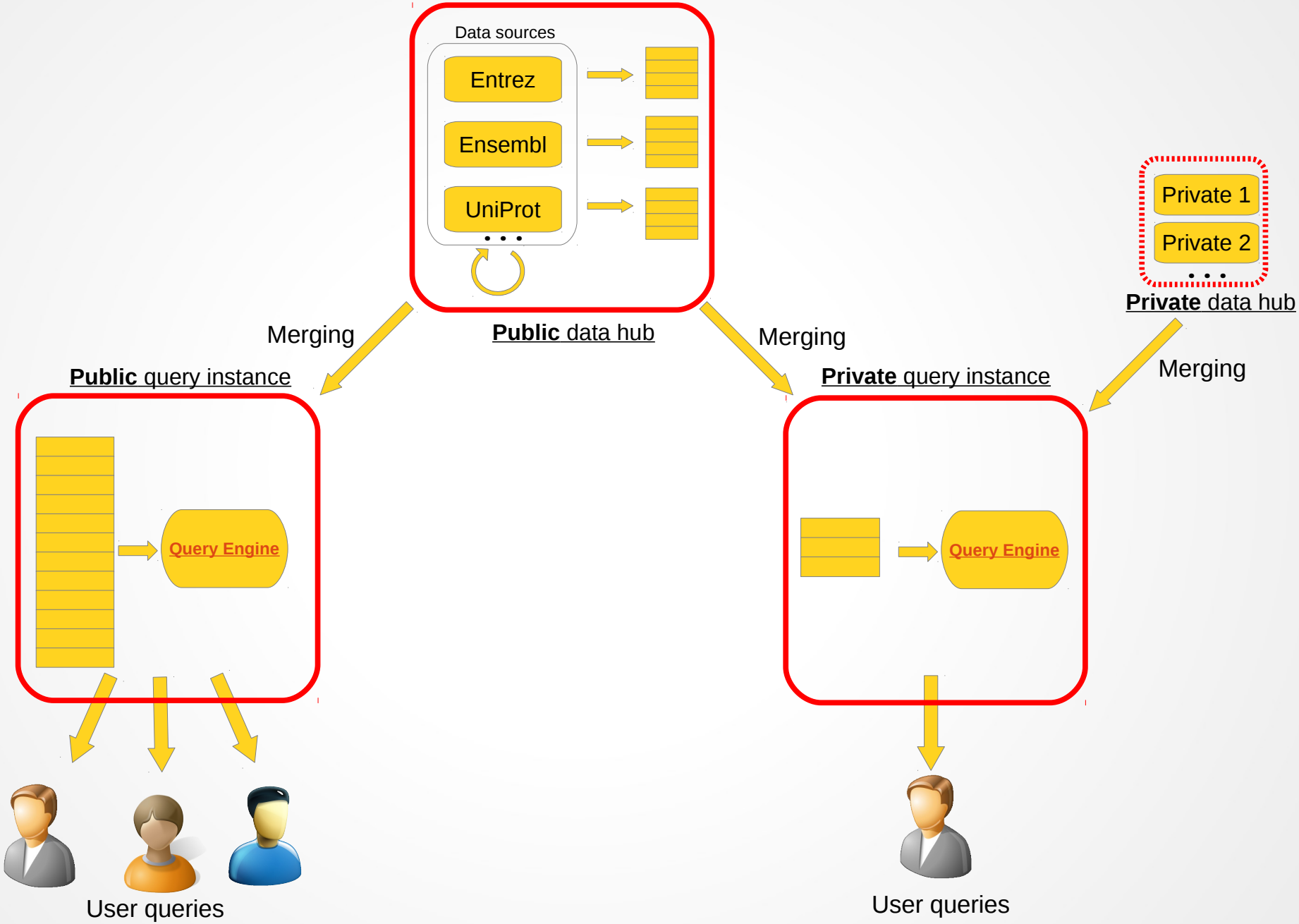


Working model – 2



Syncing from data-hub to query instances



Private query instance

- Dedicated host
- Same powerful query interface
  - Third-party packages still work
- Public data still get sync-ed
- Allow to merge private data

To reach us?

Questions on public query instance

or

interested in setting up your own private query instance?

Please let us know:

help@mygene.info

Code repositories

- Web front-end

  https://bitbucket.org/sulab/mygene.info

  Apache 2 licensed

- Data hub

  https://bitbucket.org/sulab/mygene.hub

  GPL v3 licensed

Acknowledgement

Sulab

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