

AI-DRIVEN ENTITY INTELLIGENCE RISK ANALYSIS

CAT AI (TEAM)

ADIL A

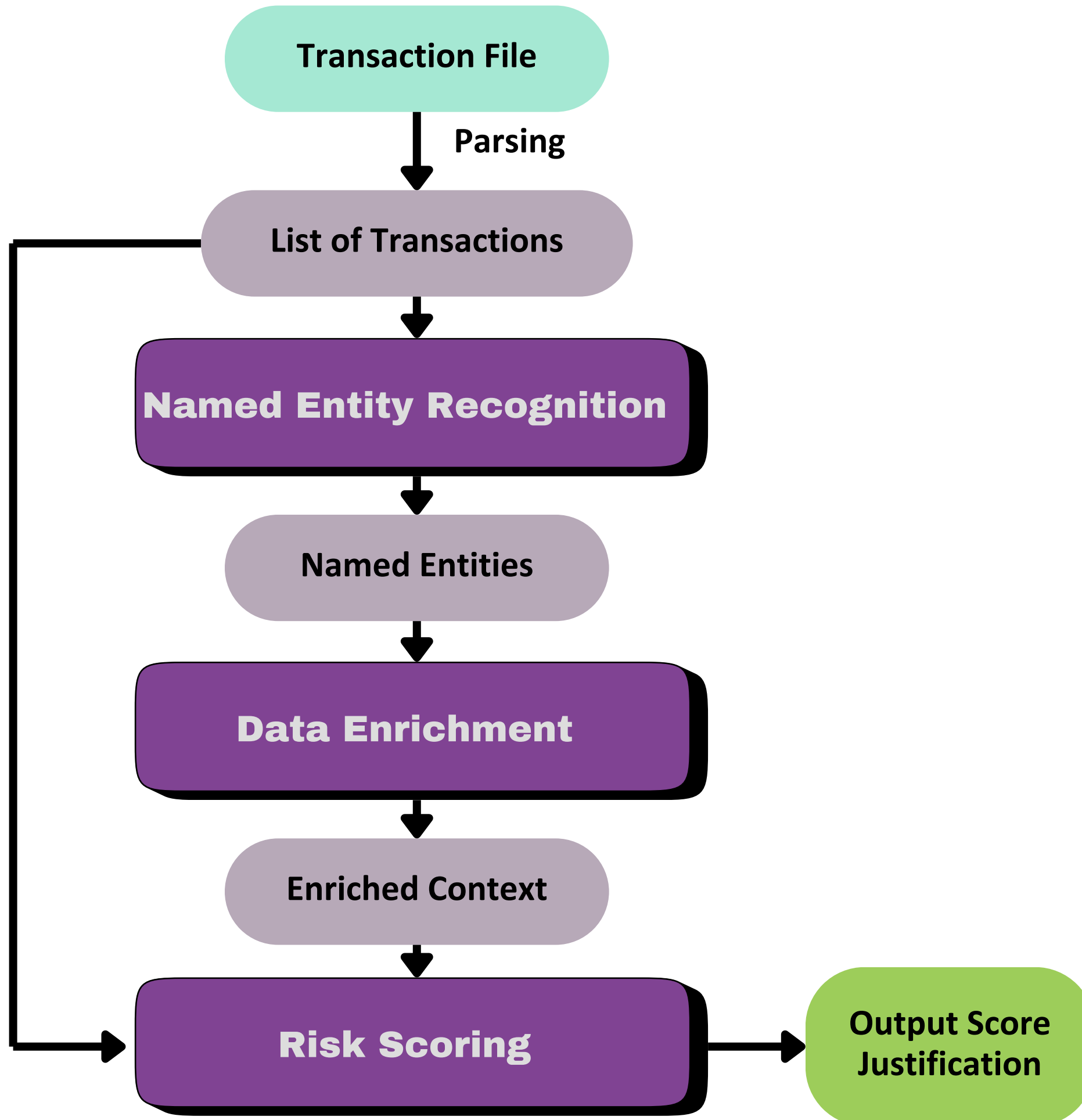
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APPROACH



01 Named Entity Recognition (NER)

The input file is separated into individual transactions and we perform NER to extract organization names, people, location, etc from the transaction.

02 Data Enrichment

From the extracted entities, we use free APIs like Wikipedia, etc, to retrieve more information about the entity and use them to enrich the context for the transaction data.

03 Scoring using Gen AI

Finally, the enriched transaction data is fed to GEN AI model to retrieve Risk Scores based on sender and receiver organizations, locations, people names, etc. Finally, a risk score is determined using normalized weighted average. The same process also gives the justification for it.

NAMED ENTITY RECOGNITION

```
1  {
2    "transaction_id": "TXN-2024-1X3Y",
3    "date": "2024-02-10T11: 45: 00Z",
4    "sender": {
5      "name": "Microsoft Corporation",
6      "account": {
7        "iban": "US89 1234 5678 9012 3456 78",
8        "bank_country": "USA"
9      },
10     "address": "One Microsoft Way, Redmond, WA, USA",
11     "notes": "Quarterly software licensing fees for enterprise solutions"
12   },
13   "receiver": {
14     "name": "Tata Consultancy Services (TCS)",
15     "account": {
16       "number": "IN98 7654 3210 9876 5432 10",
17       "bank": "State Bank of India, India"
18     },
19     "address": "TCS House, Mumbai, India",
20     "tax_id": "IN-58947"
21   },
22   "amount": {
23     "value": 12500000.0,
24     "currency": "USD"
25   },
26   "transaction_type": "Wire Transfer",
27   "reference": "Enterprise Software Solutions - Invoice #MSFT-2024-Q1",
28   "additional_notes": [
29     "Authorized by CFO Amy Hood.",
30     "Routine business payment for IT consulting services."
31   ]
32 }
```

Sample Output

01 NER using AI Model

We used AI to find entity names in the transaction for organizations, location data, etc. The following model was used `'meta-llama/Llama-3-8b-chat-hf'`.

02 Output

After NER , we would get the output in a JSON format:

```
{
  "transaction_id": "string",
  "date": "ISO 8601 format (YYYY-MM-DDTHH:MM:SSZ)",
  "sender": {
    "name": "string",
    "account": {
      "iban": "string",
      "bank_country": "string"
    },
    "address": "string",
    "notes": "string"
  },
  ...
}
```

DATA ENRICHMENT

```
1 {
2   "sender_wikipedia": "Microsoft Corporation is an American multinational technology conglomerate headquartered in Redmond, Washington. Founded in 1975, the company became highly influential in the rise of personal computers through software like Windows, and the company has since expanded to Internet services, cloud computing, video gaming and other fields. Microsoft is the largest software maker, one of the most valuable public U.S. companies, and one of the most valuable brands globally.\nMicrosoft was founded by Bill Gates and Paul Allen to develop and sell BASIC interpreters for the Altair 8800. It rose to dominate the personal computer operating system market with MS-DOS in the mid-1980s, followed by Windows. During the 41 years from 1980 to 2021 Microsoft released 9 versions of MS-DOS with a median frequency of 2 years, and 13 versions of Windows with a median frequency of 3 years. The company's 1986 initial public offering (IPO) and subsequent rise in its share price created three billionaires and an estimated 12,000 millionaires among Microsoft employees. Since the 1990s, it has increasingly diversified from the operating system market. Steve Ballmer replaced Gates as CEO in 2000. He oversaw the then-largest of Microsoft's corporate acquisitions in Skype Technologies in 2011, and an increased focus on hardware that led to its first in-house PC line, the Surface, in 2012, and the formation of Microsoft Mobile through Nokia.",
3  "receiver_wikipedia": "Tata Consultancy Services (TCS) is an Indian multinational technology company specializing in information technology services and consulting. Headquartered in Mumbai, it is a part of the Tata Group and operates in 150 locations across 46 countries. It is the second-largest Indian company by market capitalization.\nAs of 2024, TCS is ranked seventh on the Fortune India 500 list. In September 2021, TCS recorded a market capitalization of US$200 billion, making it the first Indian IT company to achieve this valuation. In 2012, it was the world's second-largest user of U.S. H-1B visas. \nIn 2024, parent company Tata Sons owned 71.74% of TCS, and close to 80% of Tata Sons' dividend income came from TCS.\n\nHistory ==\n\n=== 1968-2000 ===\n\nTata Consultancy Services Limited, originally known as Tata Computer Systems, was established in 1968 by Tata Sons Limited. The company's initial contracts involved providing punched card services to its sister company TISCO (now Tata Steel), developing an Inter-Branch Reconciliation System for the Central Bank of India, and offering bureau services to the Unit Trust of India.\nIn 1975, TCS implemented an electronic depository and trading system named SECOM for Swiss company SIS SegInterSettle. It also developed System X for the Canadian Depository System and automated the Johannesburg Stock Exchange.",
4  "sender_country": "United States",
5  "receiver_country": "India",
6 }
```

Sample Output

01 Organization History

For the sender and receiver organizations, we are gathering information about their business history from Wikipaedia and siilar free websites.

02 Location Details

Similarly, we are using the location of the organization and addresses in the transaction to search for anomalies and potential risks.

SCORING USING GEN AI WITH JUSTIFICATION

```
1  {
2    "overall_risk_score": 220,
3    "risk_category": "Medium Risk",
4    "detailed_justification": "The transaction is considered medium-risk
    due to the reputable sender and receiver entities, but the sender
    country (USA) is not a high-risk jurisdiction, and the receiver
    country (India) is not sanctioned. However, the flagged notes
    indicate a potential risk due to the 'routine business payment' and
    'authorized by CFO' notes.",
5    "risk_scores": {
6      "sender_entity_reputation": 50,
7      "receiver_entity_reputation": 50,
8      "sender_country_risk": 0,
9      "receiver_country_risk": 0,
10     "flagged_notes_risk": 120
11   }
12 }
```

Sample Output

01 Risk Score for Individual Factors

All is enriched context is finally sent to our GEN AI model to generate risk score for every entities like sender and receiver organizations, locations, transactions details and notes, etc.

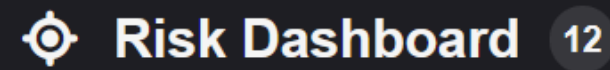
02 Final Risk Scoring

Final risk score is calculated using a weighted average of the individual risks scores. The weights determine the significance of the entity in risk scoring. Finally, the score is normalized between 0 to 100.

03 Justification

Using the same approach, we also generate a justification for the risk score provided using our GEN AI Model. The model used is `'meta-llama/Llama-3-8b-chat-hf'`.

UI PAGE



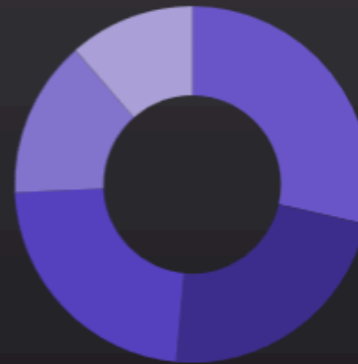
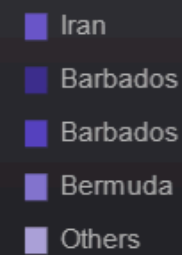
Generate Report

13%

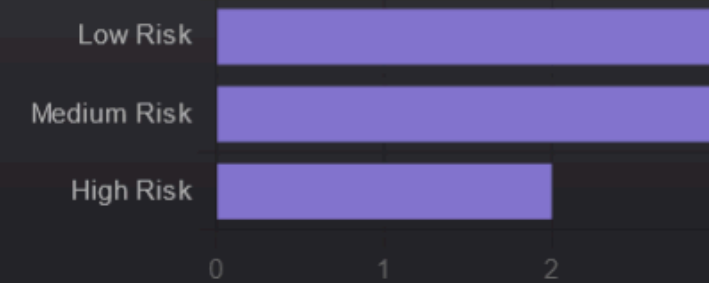
Avg. Risk Score



Geo-Risk Map



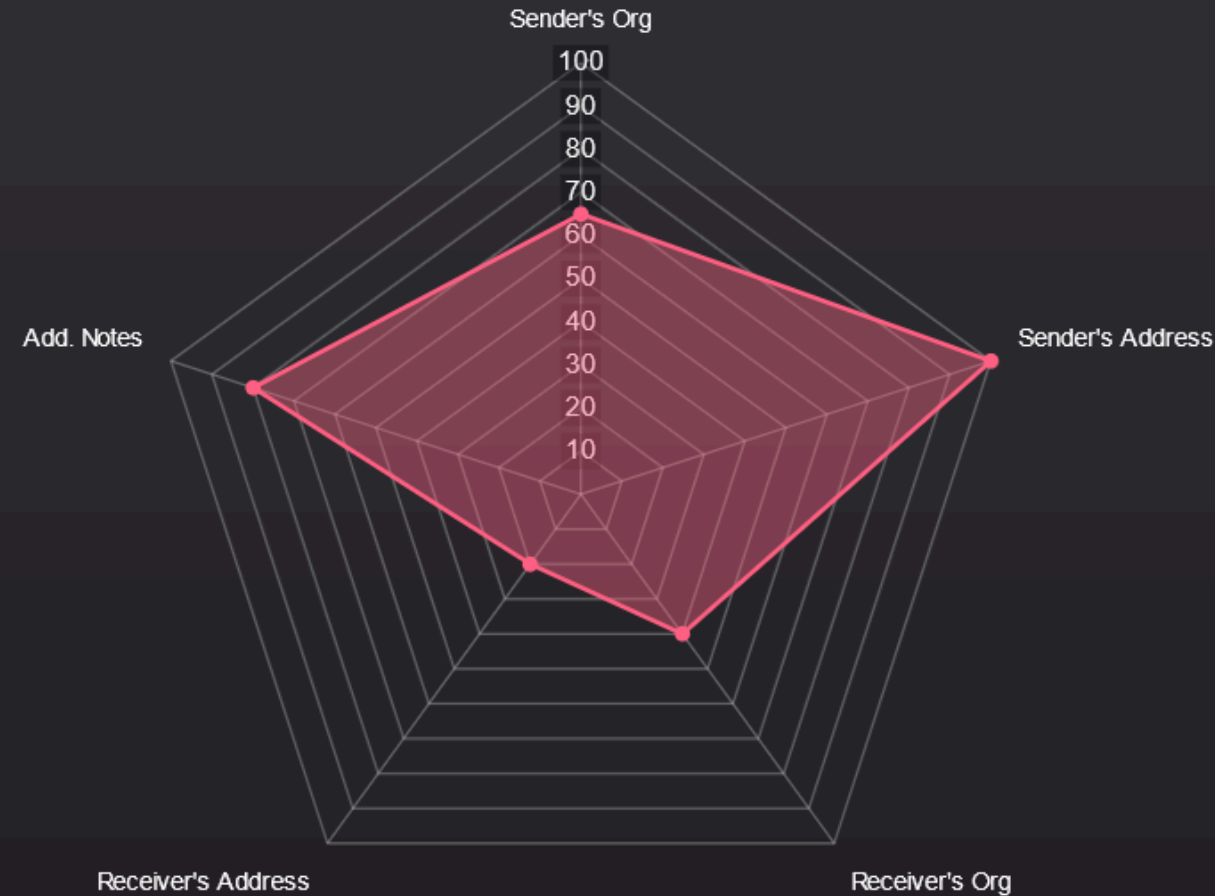
No. of Incidents



Top Risk Orgs

Risk Score Map


TXN-2024-9B7T



Txn. Id	Risk Score	Category	Sender Entity	Receiver Entity
<div><div></div>TXN-2024-4Z9P</div>	50	medium	Private Ltd.	Shell Corporation
<div><div></div>TXN-2024-1X3Y</div>	20	low	Public	Shell Corporation
<div><div></div>TXN-2024-6D3K</div>	25	low	Public Org	Private Ltd.
<div><div></div>TXN-2024-9B7T</div>	82	high	Public Org	Shell Corporation
<div><div></div>TXN-2024-2M8X</div>	87	high	Shell Corp	Private Ltd.
<div><div></div>TXN-2024-4Z9P</div>	58	medium	Private Ltd.	Shell Corporation
<div><div></div>TXN-2024-1X3Y</div>	34	medium	Public	Shell Corporation
<div><div></div>TXN-2024-6D3K</div>	30	low	Public Org	Private Ltd.

Justification

The transaction involves a sender entity with a questionable reputation, as it is an Iranian bank subject to US OFAC restrictions. The receiver entity is a free trade zone company in the UAE, which may have unclear beneficial ownership. The transaction notes indicate that the transaction was reviewed due to US OFAC restrictions and involves a front company in the UAE.



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