RELATED PARTY TRANSACTION (RPT) AUTOMATION PROJECT

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ABSTRACT :

Related Party Transactions (RPTs) involve financial dealings between entities that have a pre-existing relationship, such as subsidiaries, affiliates, or key management personnel. These transactions can lead to conflicts of interest, requiring strict compliance with corporate governance policies. Regulatory bodies mandate transparency to ensure that RPTs do not result in unfair advantages or financial misstatements. Effective monitoring of these transactions is crucial for maintaining fairness and investor confidence.

To enhance accuracy in identifying RPTs, a data-driven approach is implemented using Python and NLP techniques. The script processes vendor details by cleaning and standardizing names, removing common corporate suffixes, and applying Jaro-Winkler similarity to match records. The classification framework categorizes transactions into three groups: **Allowed (100% match), Missed (70%-99% match),** and Error (**below 70% match).** This ensures dynamic detection of related parties without hardcoded entries, improving precision in financial reporting.

Challenges in RPT identification include handling data inconsistencies, ensuring dynamic processing, and preventing hardcoded classifications. The script addresses these by automating data uploads, ensuring record integrity, and dynamically adjusting mismatched entries. The implementation in Google Colab enables seamless file handling and result extraction. By leveraging NLP and similarity measures, this approach enhances corporate transparency, minimizes errors, and ensures regulatory compliance in related party transactions.

Introduction :

Related Party Transactions (RPTs) refer to business dealings between entities that share a pre-existing relationship, such as subsidiaries, affiliates, directors, or key management personnel. These transactions include sales, purchases, loans, asset transfers, or service agreements, often raising concerns about conflicts of interest. While RPTs are not inherently illegal or unethical, they require stringent monitoring to ensure they are conducted at arm's length. Regulatory bodies impose strict disclosure and compliance requirements to prevent financial misstatements and maintain corporate integrity. Transparency in RPTs is essential to protect stakeholder interests and uphold investor confidence.

The identification and classification of RPTs pose significant challenges due to variations in company names, data inconsistencies, and the presence of common corporate suffixes. Traditional manual methods for verifying RPTs are time-consuming and prone to errors, leading to inaccurate financial reporting. To address this, advanced techniques such as Natural Language Processing (NLP) and similarity algorithms can be employed. These methods enhance accuracy in detecting related parties by standardizing and cleaning data before applying matching algorithms. Leveraging automated solutions ensures that organizations can efficiently comply with regulatory frameworks while reducing human intervention.

A robust system for processing RPTs involves multiple steps, including data extraction, preprocessing, and classification. The proposed approach utilizes *Python***,** *Jellyfish (Jaro-Winkler similarity)*, and *pandas* to compare vendor details dynamically. By cleaning names, removing unnecessary suffixes, and applying similarity scoring, the script accurately classifies records into *Allowed, Missed, and Error* categories. The classification process ensures that 100% exact matches are correctly identified while also addressing partial matches and unmatched records. This automated system improves efficiency, minimizes errors, and enhances financial transparency.

Implementing this methodology in *Google Colab* allows for seamless file uploads and downloads, making it accessible and user-friendly. The script dynamically processes vendor data without hardcoded values, ensuring flexibility across different datasets. By automating RPT detection, organizations can enhance governance practices, strengthen compliance, and reduce the risks associated with related party transactions. A data-driven approach to RPT management not only ensures regulatory adherence but also fosters a culture of accountability and fairness in corporate dealings.

Literature Review :

Research on Related Party Transactions (RPTs) highlights their dual nature—while they can facilitate business operations, they also pose risks of financial misstatements and conflicts of interest. Studies emphasize the need for stringent regulatory frameworks to ensure transparency and prevent fraudulent activities. The International Financial Reporting Standards (IFRS) and Generally Accepted Accounting Principles (GAAP) mandate disclosure of RPTs to protect stakeholder interests. Prior research suggests that companies with weak corporate governance are more prone to abusive RPTs, leading to potential financial losses. To mitigate these risks, organizations implement internal audit mechanisms, board oversight, and independent review committees. Researchers also explore the role of data analytics and machine learning algorithms in improving the detection and classification of RPTs. Recent studies focus on Natural Language Processing (NLP) and similarity algorithms to enhance RPT identification accuracy. Techniques such as Jaro-Winkler similarity, Levenshtein distance, and fuzzy matching are widely used to detect variations in company names. Research demonstrates that automated systems can significantly reduce manual effort and improve compliance by dynamically matching vendors across datasets. Python-based frameworks leveraging pandas, NumPy, and Jellyfish have proven effective in handling large financial datasets. Studies also highlight the importance of removing common corporate suffixes to improve entity matching accuracy. Overall, literature suggests that integrating AI-driven approaches with traditional governance mechanisms can strengthen RPT monitoring and enhance financial transparency.

Methodology :

The methodology for identifying and classifying *Related Party Transactions (RPTs)* involves a structured *data-driven approach* using *Python and NLP techniques*. First, vendor data from the *Customer Master* and *RPT Master List* is extracted and preprocessed by removing corporate suffixes and cleaning text using *regular expressions*. Next, the cleaned vendor names are compared using the *Jaro-Winkler similarity algorithm* to measure name matching accuracy. The results are categorized into *Allowed (100% match), Missed (70%-99% match), and Error (below 70% match)* groups. A dynamic filtering mechanism ensures unmatched vendors are correctly identified without hardcoding. The script is implemented in *Google Colab*, enabling easy file uploads and downloads. By automating the process, the methodology improves *accuracy, efficiency, and compliance* in RPT identification.

Patient Management

- *Regulatory Compliance* – Ensuring all RPTs follow corporate governance policies, financial regulations, and disclosure requirements set by bodies like IFRS and GAAP.
- *Transaction Transparency* – Maintaining proper documentation and clear reporting of all related party transactions to prevent conflicts of interest and unethical practices.
- *Automated Detection & Monitoring* – Using *NLP and similarity algorithms* to identify and classify RPTs dynamically, reducing manual errors and improving efficiency.
- *Independent Oversight* – Establishing an independent audit committee to review and approve RPTs, ensuring transactions are conducted at *arm's length* and in the company's best interest.
- *Data Accuracy & Validation* – Cleaning and preprocessing vendor data to remove inconsistencies, duplicate records, and corporate suffixes for precise entity matching.
- *Periodic Review & Risk Assessment* – Regularly evaluating RPTs for potential risks, financial impact, and governance effectiveness to enhance accountability and compliance.

Appointment Scheduling

- Enables patients to book, reschedule, or cancel appointments through an intuitive online interface.
- Notifies both patients and doctors about upcoming appointments via automated SMS and email reminders.
- Reduces patient waiting time by optimizing doctor schedules and preventing overlapping appointments.
- Allows hospital administrators to manage and modify schedules based on doctor availability.
- Provides patients with estimated wait times and real-time queue updates for better service experience.

Doctor Management

- **Disclosure of Interests** – Directors must disclose their financial interests in related entities to ensure transparency and prevent conflicts of interest.
- **Approval & Oversight** – A board or audit committee should review and approve all RPTs involving directors to ensure compliance with governance policies.
- **Regulatory Compliance** – Directors must ensure that RPTs adhere to legal frameworks, such as IFRS, GAAP, and corporate governance codes, to avoid legal penalties.
- **Independent Review** – Companies should appoint independent directors or third-party auditors to review RPTs and ensure transactions are conducted at arm's length.
- **Monitoring & Reporting** – Regular monitoring of RPTs involving directors should be conducted, with proper documentation and reporting to stakeholders.

- **Ethical Responsibility** – Directors must uphold ethical standards by ensuring that related party transactions do not harm the company's financial health or shareholder value.

Pharmacy Operations

- *Identification & Classification* – Using automated systems and *NLP-based similarity algorithms* to detect and categorize related party transactions accurately.
- *Approval & Documentation* – Ensuring all RPTs are approved by the *board or audit committee* and properly documented for compliance and transparency.
- *Regulatory Compliance* – Adhering to financial regulations such as *IFRS, GAAP, and corporate governance codes* to prevent legal violations and financial misstatements.
- *Risk Assessment & Monitoring* – Implementing continuous *monitoring systems* to assess risks associated with RPTs and prevent fraudulent transactions.
- *Audit & Reporting* – Conducting regular audits and *transparent financial reporting* to ensure that RPTs do not negatively impact stakeholders or the organization.

Analytics

- **Data Cleaning & Preprocessing** – Standardizing vendor names by removing corporate suffixes, punctuation, and duplicates to ensure accurate comparison and reduce false matches.
- **Similarity Matching Algorithms** – Utilizing Jaro-Winkler, Levenshtein distance, and fuzzy matching to detect related entities and categorize transactions based on match percentages.
- **Classification & Segmentation** – Categorizing RPTs into Allowed (100% match), Missed (70%-99% match), and Error (below 70% match) to improve accuracy in transaction identification.
- **Trend Analysis & Risk Detection** – Using machine learning and statistical models to detect patterns, anomalies, and potential risks in RPTs over time.
- **Automated Reporting & Visualization** – Generating dashboards and reports using pandas, NumPy, and visualization tools like Matplotlib or Power BI for better decision-making and compliance tracking.

Results :

- **Accurate Identification of Related Parties** – The NLP-based similarity matching method effectively detects and classifies related party vendors with improved precision, reducing manual errors.
- **Clear Categorization of Transactions** – Transactions are systematically classified into Allowed (100% match), Missed (70%-99% match), and Error (below 70% match), ensuring transparency in reporting.
- **Reduced Compliance Risks** – By automating the detection of RPTs, the system minimizes the risk of regulatory violations and financial misstatements, ensuring compliance with governance policies.
- **Enhanced Data Integrity & Efficiency** – The preprocessing of vendor names and removal of duplicates result in clean, structured, and reliable datasets, improving the accuracy of financial analysis.
- **Improved Decision-Making & Audit Readiness** – With automated reports and clear audit trails, stakeholders and auditors can easily verify transactions, enhancing financial transparency and accountability.

Discussion :

- **Importance of Accurate Identification** – Proper detection of related party transactions is essential to ensure financial transparency and prevent conflicts of interest that could impact corporate governance.
- **Challenges in Vendor Matching** – Inconsistent naming conventions, missing data, and duplicate entries can lead to errors in identifying related entities, making advanced NLP and similarity algorithms crucial for accuracy.
- **Regulatory & Compliance Considerations** – Companies must adhere to financial regulations (e.g., IFRS, GAAP) and governance policies to avoid penalties and maintain stakeholder trust in financial reporting.
- **Impact on Financial Reporting & Risk Management** – Effective RPT monitoring reduces the risk of fraud, misstatements, and unethical transactions, ensuring a robust financial system within the organization.
- **Role of Automation & Analytics** – The integration of machine learning, fuzzy matching, and automated reporting enhances efficiency, reduces manual effort, and improves the accuracy of RPT classification and auditing.

Conclusion :

The analysis of *Related Party Transactions (RPTs)* plays a crucial role in ensuring financial transparency, regulatory compliance, and corporate governance. By implementing *automated data processing and similarity matching techniques*, organizations can accurately detect and categorize related

parties, reducing the risk of financial misstatements. The use of *NLP-based algorithms* improves accuracy in vendor matching, minimizing errors caused by inconsistent naming conventions. Effective *monitoring, classification, and reporting* of RPTs help organizations maintain accountability and meet legal obligations. Despite challenges in data inconsistencies, automated *RPT detection systems* enhance efficiency and reduce manual efforts. Ensuring *strict regulatory adherence* prevents fraudulent transactions and protects stakeholders' interests. Future improvements may include *AI-driven predictive analytics* to detect potential RPT risks proactively. Thus, integrating *advanced analytics and automation* strengthens financial governance and risk management.

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