FORM 2

THE PATENT ACT, 1970

(39 of 1970)

AND

THE PATENTS RULES, 2003

COMPLETE SPECIFICATION

(Section 10; rule 13)

TITLE OF THE INVENTION:

A Shared Ordering Platform for Collaborative Procurement Among Multiple Entities

APPLICANTS:

***(a)* Name**: SRINIVAS RAJU CHAKRAVARAM

***(b)* Nationality**: Indian

***(c)* Address**: Flat No. 101, Kakatiya Homes, Nallagandla HUDA Layout, Serilingampally, Hyderabad – 500019, Telangana, India

PREABMBLE TO THE DESCRIPTION

The following specification particularly describes the invention and the way it is to be performed.

DESCRIPTION OF INVENTION

FIELD OF INVENTION

The present invention pertains to the field of procurement and supply chain management, specifically focusing on collaborative procurement systems.

More particularly, the present invention involves the development and implementation of a shared ordering platform designed to facilitate cooperative purchasing among multiple entities such as small to medium-sized enterprises (SMEs), offices, restaurants, and small-scale industries.

BACKGROUND OF THE INVENTION

Businesses and organizations of various sizes face significant challenges in competing with larger enterprises due to their limited ability to leverage economies of scale, negotiate favorable terms with suppliers, and optimize logistics. This disparity often results in higher costs and restricted growth and competitiveness for smaller entities. These challenges primarily stem from limited purchasing power, which affects their ability to negotiate favorable terms with suppliers and secure cost-effective procurement options.

Economies of Scale: Larger businesses benefit from economies of scale, allowing them to purchase goods and services in bulk at discounted rates. This advantage is largely unavailable to smaller entities that do not have the volume of purchases needed to negotiate similar discounts. As a result, smaller businesses often pay higher prices for the same goods and services, impacting their profitability and market competitiveness.

Supply Chain Optimization: Large enterprises typically have sophisticated supply chain management systems that optimize procurement, logistics, and inventory management. These systems leverage advanced data analytics and forecasting tools to minimize costs and improve efficiency. Smaller entities often lack the resources and technological infrastructure to implement such systems, leading to higher operational costs and inefficiencies in their supply chain processes.

Access to Diverse Suppliers: Large organizations have established networks with a wide range of suppliers, providing them with access to a diverse selection of products

and services. This diversity allows for better sourcing options and contingency planning. In contrast, smaller entities may be limited to a few suppliers, restricting their choices and increasing their vulnerability to supply chain disruptions.

Negotiation Power: The ability to negotiate favorable terms with suppliers is a critical advantage for larger businesses. Their significant purchasing volume provides leverage to secure better pricing, payment terms, and delivery schedules. SMEs and other smaller entities, with their lower purchasing volumes, often lack this bargaining power, resulting in less favorable procurement terms.

Data-Driven Decision Making: Advanced data analytics and business intelligence tools enable larger businesses to make informed, strategic procurement decisions. These tools analyze purchasing patterns, market trends, and supplier performance to optimize procurement strategies. Smaller businesses often do not have access to these sophisticated tools, leading to suboptimal procurement decisions that can negatively impact their competitiveness and operational efficiency.

Logistics and Distribution: Large enterprises benefit from integrated logistics and distribution networks that reduce transportation costs and delivery times. These networks are often supported by advanced tracking and inventory management systems. Smaller entities, on the other hand, face higher shipping costs and longer delivery times due to their lower shipping volumes and less integrated logistics systems.

Collaborative Procurement: While collaborative procurement can provide significant advantages by pooling resources and sharing costs, smaller entities often struggle to find and manage collaborative opportunities. The lack of a structured platform for facilitating such collaborations means that potential cost savings and efficiencies are often unrealized.

Risk Management: Large businesses have the resources to implement comprehensive risk management strategies that protect against supply chain disruptions, price volatility, and other procurement risks. Smaller entities typically have fewer resources to dedicate to risk management, making them more susceptible to these challenges.

These drawbacks highlight the disparities between large enterprises and smaller entities in procurement capabilities. The existing state of the art fails to adequately

address the needs of SMEs, offices, restaurants, and small-scale industries, leaving them at a competitive disadvantage. There is a clear need for innovative solutions that can level the playing field, enabling these smaller entities to benefit from collective buying power, optimized supply chain processes, and advanced data analytics.

The present invention addresses the shortcomings of the existing state of the art and describes a shared ordering platform for collaborative procurement among multiple entities.

OBJECT OF THE INVENTION

The primary object of the present invention is to provide a shared ordering platform for collaborative procurement among multiple entities to enable multiple businesses to leverage collective buying power, thereby obtaining bulk purchase discounts and reducing individual procurement costs.

Further object of the present invention is to minimize shipping costs by consolidating orders from multiple entities into larger, more economical shipments.

Further object of the present invention is to provide users with access to a broader range of products and services through collaborative procurement and to facilitate the discovery of new suppliers and products, thereby enhancing the variety and quality of items available to businesses.

BRIEF DESCRIPTION OF DRAWINGS

The accompanying drawings constitute a part of this specification and illustrate one or more embodiments of the invention. Preferred embodiments of the invention are described in the following with reference to the drawings, which are for the purpose of illustrating the present preferred embodiments of the invention and not for the purpose of limiting the same.

For simplicity and clarity of illustration, the drawing figures illustrate the general manner of construction, and descriptions and details of well-known features and techniques may be omitted to avoid unnecessarily obscuring the invention. Additionally, elements in the drawing figures are not necessarily drawn to scale. For example, the dimensions of some of the elements in the figures may be exaggerated relative to other elements to help improve understanding of embodiments of the

present invention. The same reference numerals in different figures denotes the same elements.

In the drawings:

Figure 1 illustrates a customer 1's and customer 2's item selection and Draft Order (100). Customer 1 begins the process by logging into the customer portal and creating a draft order. This order includes specific items identified as items 1, 2, 3, 4, and 5. The system automatically sets a default time for the placement of this order, which can be adjusted by Customer 1 based on their urgency or preference. This draft order is stored in the system, awaiting potential matching with orders from other customers. The primary purpose of this diagram is to illustrate the initial step in the collaborative purchasing process, where a single customer initiates an order that can later be matched with others for bulk purchasing benefits.

Following the same initial steps as Customer 1, Customer 2 logs into the customer portal and creates their draft order. This order includes items 6, 7, and 1. The system stores this draft order alongside Customer 1's draft, and it is now part of the pool of orders awaiting matching. The inclusion of item 1 in both Customer 1's and Customer 2's drafts indicate a potential match, which the system will identify and leverage for collaborative filtering and clustering. This diagram highlights the system's ability to handle multiple draft orders simultaneously, setting the stage for identifying shared purchasing opportunities.

Figure 2 illustrates Customer 3's and Customer 4's item selection and Draft Order (200), wherein Customer 3 creates a draft order that includes items 8, 9, 1, and 4. As with previous drafts, this order is stored in the system. The system analyzes Customer 3's order in real-time, looking for overlaps with existing orders. The presence of items 1 and 4, which appear in previous drafts, indicates potential shared order opportunities. This diagram demonstrates the system's capability to analyze new orders as they are created, using collaborative filtering techniques to identify items that could be part of a combined order.

Customer 4 logs in and drafts an order comprising items 1, 2, 3, 4, and 8. The system initiates a real-time scan of existing draft orders to identify matching items. Given that

Customer 4's order shares multiple items with previous orders, the system uses collaborative filtering to recommend a combined order. This diagram showcases the system's real-time matching process, emphasizing how it leverages both user-based and item-based collaborative filtering to recommend shared purchasing opportunities based on item overlap and customer proximity.

Figure 3 represents Notification System (300) in accordance with the embodiments of the present invention, wherein, once the system identifies potential matches, it promptly notifies Customer 4 and other relevant customers about the opportunity for a shared order. This notification includes detailed information about the matching items and the customers who have drafted orders containing these items. The notification system is built on an event-driven architecture, ensuring timely updates and efficient communication. Customers receive notifications through the portal interface, where they can review the details and decide to join the shared order. This diagram emphasizes the importance of timely and detailed notifications in facilitating collaborative purchasing.

Figure 4 depicts Order Consolidation (400) in accordance with the embodiments of the present invention, wherein, if Customer 4 decides to join the shared order initiated by Customer 1, the system consolidates both orders into a single combined order. Diagram 202 illustrates this consolidation process, where individual item quantities from both orders are aggregated to reflect the combined needs. Diagram 202a further details the final order sent to the supplier, highlighting the benefits of bulk purchasing. This consolidated order is placed with the supplier, ensuring better pricing and terms due to the increased volume. The system also coordinates the logistics to ensure efficient delivery to all participating customers. These diagrams demonstrate the system's ability to streamline the order consolidation process, maximizing savings and logistical efficiency.

Figure 5 illustrates payment timeframe establishment (500) in accordance with the embodiments of the present invention wherein, a specific timeframe is established for customers to confirm their payment method. Diagram 401 outlines this process, where all participating customers must agree on the payment terms before the final order is placed with the supplier. This ensures that all participants are committed, and the

order can proceed smoothly. The diagram illustrates the steps involved in setting this timeframe and confirming payment methods, ensuring a coordinated purchasing process. This aspect of the system ensures that all financial commitments are secured before placing the consolidated order.

SUMMARY OF THE INVENTION

Embodiments of the present disclosure present technological improvements as solution to one or more of the above-mentioned technical problems recognized by the inventor in conventional practices and existing state of the art.

The present invention addresses the significant challenges faced by small to medium-sized enterprises (SMEs), offices, restaurants, and small-scale industries in the realm of procurement and supply chain management. This invention introduces a shared ordering platform designed to facilitate collaborative procurement among multiple entities. By leveraging collective buying power, this platform enables participants to achieve cost efficiencies and strategic advantages typically reserved for larger enterprises.

In accordance with an aspect of the present invention, the platform allows multiple businesses to combine their purchasing power, enabling bulk buying and securing better prices from suppliers. This collaborative model reduces individual shipping costs and optimizes the supply chain process, making it more efficient and cost-effective.

In accordance with another aspect, the platform intelligently groups buyers based on geographic proximity and item preferences utilizing geo-location-based clustering and collaborative filtering techniques. This approach enhances the accuracy of recommendations and facilitates the formation of effective buyer clusters.

In accordance with a further aspect of the present invention, the platform incorporates a real-time matching and notification system powered by streaming data platforms such as Apache Kafka. It continuously updates buyer profiles and clusters with new data, ensuring that recommendations and matches are adjusted dynamically to reflect the most current information.

In accordance with another aspect of the present invention, hybrid machine learning models, including ensemble learning and deep learning architectures, are employed to improve the accuracy and relevance of recommendations. These models analyze long-term and short-term buyer preferences, enabling highly personalized and effective procurement strategies.

In accordance with another aspect of the present invention, the platform includes a robust escrow account system to manage shared orders securely and confidentially. This system ensures that payments from multiple buyers are collected and verified before placing a shared order with a vendor. Funds are released to the vendor upon successful completion and verification of predefined milestones, maintaining buyer confidentiality throughout the process.

The shared ordering platform not only reduces procurement costs for diverse entities but also serves as a strategic enabler. By fostering innovation, providing data-driven insights, and facilitating market expansion, the platform significantly enhances the operational efficiency and competitive positioning of its users. This invention transforms the procurement landscape, enabling SMEs, offices, restaurants, and small-scale industries to compete more effectively with larger enterprises.

While the invention has been described with reference to specific embodiments, various modifications and alterations can be made without departing from the scope of the invention, as defined by the appended claims.

The objects and the advantages of the invention are achieved by the process elaborated in the present disclosure.

DETAILED DESCRIPTION OF THE INVENTION

The following detailed description illustrates embodiments of the present disclosure and ways in which the disclosed embodiments can be implemented. Although some modes of carrying out the present disclosure have been disclosed, those skilled in the art would recognize that other embodiments for carrying out or practicing the present disclosure are also possible.

The present invention describes a shared ordering platform for collaborative procurement among multiple entities designed to facilitate collaborative procurement

among multiple entities, including small to medium-sized enterprises (SMEs), offices, major businesses, restaurants, and small-scale industries. The platform leverages advanced geo-location clustering, collaborative filtering, real-time data processing, and machine learning techniques to enhance procurement efficiency, reduce costs, and provide access to a broader range of products and services.

System Components

User Interface: The user interface serves as the primary interaction point for buyers, enabling them to input and manage their purchase requests. It is designed for ease of use, ensuring accessibility for users with varying technical proficiency.

Clustering Algorithm: This algorithm groups buyers based on geo-location and purchase preferences, optimizing buyer clusters dynamically. It employs hierarchical clustering techniques, incorporating geolocation coordinates, purchase frequency, and item preferences into the clustering features, allowing for effective grouping of buyers with similar needs.

Collaborative Filtering System: The collaborative filtering system identifies similar item preferences among buyers to enhance recommendation accuracy. It includes both user-based collaborative filtering, leveraging historical buyer data, and item-based collaborative filtering, analyzing item preferences and purchasing patterns to suggest relevant products.

Dynamic Geographic Radius Adjustment Module: This module optimizes the clustering radius based on real-time buyer density and activity levels using a dynamic radius adjustment algorithm. This ensures that clusters are always appropriately sized to maximize efficiency and relevance.

Escrow Account Management Module: This module handles payments from multiple buyers, ensuring secure and coordinated transactions. It includes features for setting up and managing escrow accounts, keeping buyer contributions confidential, and verifying that the total required payment is met.

Payment Verification Module: The payment verification module confirms the total contributions from buyers, ensuring that the required order amount is met before proceeding with the order placement.

Order Placement Module: Once payments are verified, the order placement module consolidates the purchase requests and places the final order with the vendor. This module ensures that the order is correctly compiled and submitted.

Milestone Verification Module: This module manages order fulfillment by verifying the completion of predefined milestones. It involves a coordinating entity that checks evidence or deliverables provided by the vendor to confirm milestone completion.

Fund Release Module: The fund release module disburses payments to vendors upon successful verification of milestones. Payments are released incrementally, ensuring accountability and reducing risks for buyers.

Confidentiality Module: This module maintains the anonymity of buyers throughout the process, employing encryption and anonymization techniques to protect buyer identities and transaction details, ensuring privacy and security.

Real-Time Data Integration Module: The real-time data integration module uses platforms like Apache Kafka to handle continuous streams of buyer activity data. This ensures that buyer profiles and matching are always up-to-date.

Notification System: The notification system employs an event-driven architecture to trigger alerts based on predefined criteria such as matching items, geolocation proximity, and buyer engagement patterns. It ensures timely and relevant notifications to buyers.

Hybrid Machine Learning Models (113): These models combine algorithms like Random Forests and Gradient Boosting Machines to enhance prediction accuracy and recommendation relevance. The system dynamically adjusts model weights based on recent performance.

Deep Learning Architectures: Deep learning architectures, such as Recurrent Neural Networks (RNN) with attention mechanisms, are used to capture long-term and short-term trends in buyer data, providing personalized recommendations.

Smart Notification System: This system schedules notifications based on buyer engagement patterns, ensuring that alerts are timely and relevant to maximize participation and user experience.

Escrow Agent: The escrow agent manages the verification of payments, handles disputes, and ensures secure transactions throughout the order process. The agent plays a crucial role in maintaining the integrity of the escrow system.

Operation and Working Example

The platform operates by collecting purchase requests from buyers through the user interface. The clustering module groups buyers based on geo-location and purchase preferences, while the dynamic geographic radius adjustment module optimizes the clustering radius. The collaborative filtering system enhances recommendation accuracy by identifying similar item preferences among buyers.

Payments are managed through the escrow account management module, ensuring secure and coordinated transactions. The payment verification module confirms total contributions from buyers, and the order placement module consolidates and places orders with vendors. The milestone verification module manages order fulfillment, verifying the completion of predefined milestones, while the fund release module disburses payments incrementally upon successful verification.

The real-time data integration module ensures up-to-date buyer profiles and matching, and the notification system provides timely alerts based on predefined criteria. Hybrid machine learning models and deep learning architectures enhance prediction accuracy and recommendation relevance, while the smart notification system ensures relevant and timely notifications. The escrow agent verifies payments, manages disputes, and ensures secure transactions, with the confidentiality module maintaining buyer anonymity throughout the process.

In an example scenario, buyers within a specific geolocation can be matched in real-time for shared orders. For instance, Buyer 1 purchases items 1, 2, and 3 within a 50-mile radius, and Buyer 2, within the same radius, adds items 1 and 2 to their cart. The system detects matching items and geolocation proximity, triggering a notification to Buyer 2 about Buyer 1’s similar order, presenting an opportunity to join the shared order for better rates. This process is managed securely and confidentially, ensuring smooth transactions and leveraging collective buying power for cost savings and efficiency.

This invention provides a comprehensive solution for collaborative procurement, enabling SMEs, offices, major businesses, restaurants, and small-scale industries to operate more efficiently and competitively by leveraging collective buying power and advanced technological capabilities.

5

CLAIMS:

I Claim:

1. A shared ordering platform for collaborative procurement among multiple entities, the said platform comprising:
   - a user interface for collecting purchase requests from multiple buyers, facilitating input and interaction;
   - a clustering module for grouping buyers based on geo-location and purchase preferences, optimizing buyer clusters dynamically;
   - a collaborative filtering system for identifying similar item preferences among buyers, enhancing recommendation accuracy;
   - a dynamic geographic radius adjustment module for optimizing clustering radius based on buyer density and activity levels;
   - an escrow account management module for handling payments from multiple buyers, ensuring secure and coordinated transactions;
   - a payment verification module for confirming total contributions from buyers, ensuring the required order amount is met;
   - an order placement module for consolidating and placing orders with vendors upon verification of payments;
   - a milestone verification module for managing order fulfillment and verifying completion of predefined milestones;
   - a fund release module for disbursing payments to vendors upon successful milestone completion and verification;
   - a confidentiality module for maintaining anonymity of buyers throughout the process, ensuring privacy and security;

   wherein the clustering module and collaborative filtering system are integrated to form geo-aware, preference-based buyer clusters that enhance the accuracy of product recommendations and shared order opportunities
2. The shared ordering platform as claimed in Claim 1, wherein the clustering module employs hierarchical clustering techniques to group buyers, incorporating geolocation coordinates, purchase frequency, and item preferences in the clustering features.

3. The shared ordering platform as claimed in Claim 1, wherein the dynamic geographic radius adjustment module uses a dynamic radius adjustment algorithm that optimizes the clustering radius based on real-time buyer density and activity levels.
4. The shared ordering platform as claimed in Claim 1, wherein the collaborative filtering system includes user-based collaborative filtering that leverages historical buyer data to recommend items to similar buyers.
5. The shared ordering platform as claimed in Claim 1, wherein the collaborative filtering system includes item-based collaborative filtering that analyzes item preferences and purchasing patterns to suggest relevant products to buyers.
6. The shared ordering platform as claimed in Claim 1, wherein the real-time data integration module uses Apache Kafka to handle continuous streams of buyer activity data, ensuring up-to-date buyer profiles and matching.
7. The shared ordering platform as claimed in Claim 1, wherein the notification system employs an event-driven architecture that triggers alerts based on predefined criteria such as matching items, geolocation proximity, and buyer engagement patterns.
8. The shared ordering platform as claimed in Claim 1, wherein the hybrid machine learning models combine algorithms such as Random Forests and Gradient Boosting Machines to enhance prediction accuracy and recommendation relevance.
9. The shared ordering platform as claimed in Claim 1, wherein the deep learning architectures use Recurrent Neural Networks (RNN) with attention mechanisms to capture long-term and short-term trends in buyer data, providing personalized recommendations.
10. The shared ordering platform as claimed in Claim 1, further comprising a smart notification system that schedules notifications based on buyer engagement patterns, ensuring timely and relevant alerts to maximize participation and user experience.
11. The shared ordering platform as claimed in Claim 1, wherein the escrow account management module includes an escrow agent who verifies payments, manages disputes, and ensures secure transactions throughout the order process.

12. The shared ordering platform as claimed in Claim 1, wherein the milestone verification module uses a coordinating entity to verify the completion of predefined milestones based on evidence or deliverables provided by the vendor.
13. The shared ordering platform as claimed in Claim 1, wherein the confidentiality module employs encryption and anonymization techniques to protect buyer identities and transaction details throughout the procurement process.
14. The shared ordering platform as claimed in Claim 1, wherein the fund release module is configured to release funds to vendors incrementally upon successful verification of each milestone, ensuring accountability and reducing risk for buyers.

Dated this: 17th June, 2024

Sign:

Name of the Signatory: Mr. Paresh Ravindra Chinchole

Patent Agent Code: IN/PA-3052

ABSTRACT:

Title of the Invention:

A shared ordering platform for collaborative procurement among multiple entities

The present invention discloses a shared ordering platform designed to facilitate collaborative procurement among multiple entities such as SMEs, offices, restaurants, and small-scale industries. The said platform includes a buyer matching and notification system utilizing geo-location-based clustering and collaborative filtering, a real-time data integration module with streaming data platforms, and a dynamic recommendation adjustment algorithm. Additionally, an escrow account management module ensures secure and confidential handling of payments and order placements. Machine learning models, including ensemble and deep learning techniques, enhance the accuracy of buyer clustering and recommendations. The platform's notification system alerts users about potential matches and savings opportunities. This innovative approach leverages collective buying power to reduce costs, streamline logistics, and provide access to a broader product range, thereby leveling the competitive field for smaller entities.

Figure of Abstract:

Figure 3