You are a software engineer working in the Information System department to support the Purchasing Business Unit of A-Zeller Incorporated. You are supporting a new purchasing system named **iProc**, which interfaces to A-Zeller's Inventory Management (IM), Warehouse Management (WM) and Accounts Payable (AP) Systems.

Your software engineering team received the following business requirements from Robert Marshall, director of the Purchasing Business Unit of A-Zeller and his team of purchasing managers and buyers.

In recent years, our company has gained a global customer base and we want to sustain our growth by aligning our operations with our company's mission, which is to maintain customer satisfaction by shipping the right products to customers on time. In the next eight months, we want to replace our current mainframe-based procurement system with a more robust and highly secure system and align it with other object-oriented application systems in our company.

The iProc system must provide all functions for our Chief Operation Officer (COO), authorized buyers and managers. They need to monitor purchasing activities and inventory levels and to replenish the inventory when an item's quantity-on-hand is below a minimum level.

For each physical item to be purchased and received in our warehouse, a buyer must create it (i.e. define it's corresponding logical item) in the item master. Each item contains a unique item number, description, minimum order quantity, purchase price, effective date, and preferred vendor.

An item can be purchased from one of our preferred vendors. A buyer must be able create a vendor before he/she issues a purchase order to buy items from that vendor. A vendor has a unique vendor ID, vendor name (this is a company name), corporate address (street, city, zip code, country) where the purchase order is sent, contact person (first name and last name), phone number and email address of the contact person.

A buyer must be able to run a periodic inventory report where he/she specifies a date range, such as from September 1, 2017 to September 30, 2017. In addition, he/she must be able to specify the sort criteria such as sort by item number, by vendor, or by quantity on hand (low to high, or high to low). We need your help to design a useful report for our buyers.

When a buyer issues a purchase order, he/she must be able to select items previously defined in the item master, a preferred vendor, purchase quantity, unit of measure (each, dozen, box, others) and purchase price. A purchase order may contain multiple items to be purchased from a vendor. In addition, the buyer must be able to optionally add comments on a purchase order. If the total purchase order amount is $5,000.00 or more, the buyer must submit the purchase order to an appropriate procurement manager, who can approve it. A buyer is authorized to approve a purchase order with an amount less than $5,000.00.

With the new iProc system, our company's COO must be able to create accounts for authorized buyers and procurement managers and set their purchasing limit for approval. The buyers and managers then use their account to log into the new system. In addition, the new iProc system must enable the COO and procurement managers to run a procurement activity report to help him/her analyze purchasing activities and to assist with cash flow analysis. We will rely on you to design and create a prototype of this report for the COO and procurement managers to preview and approve.

By the way, our buyers must be able to submit one or more purchase orders with an "Approved" status to the associated vendors and receive an email confirmation that the orders have been submitted. Once the purchase orders are submitted, our AP and IM systems must be notified of the submitted purchase orders.

It is very important that the iProc system is highly secured and accessible only by authorized employees. We want our buyers to be able to access the system 24x7.