Consider the following description of a mail order processing “system.”

A mail order company advertises in magazines. Most orders are initiated by magazine subscribers who fill in and send coupons to the mail order company. The company also takes orders over the phone, answers inquiries about the products, and handles payments and cancellations of orders. Products that have been ordered are either sent directly to the customer or to regional offices of the company, which then handle the required distribution. The mail order company has three basic data files that retain customer mailing information, product inventory information, and billing information based upon invoice number.

Additional information to consider
- before an order can be shipped all items on the order must be in inventory and the customer must be one in good standing,
- inventory must be relieved of all items before an order can be shipped,
- an invoice must accompany all orders,
- when an order is cancelled, a cancellation acknowledgement is sent to the customer, and
- when a payment is received for an order, the appropriate file(s) are updated and a corresponding invoice is sent to the customer denoting whether it is “paid in full” or has a “balance remaining.”

During the next few years the company expects to become a multi-million dollar operation. Recognizing the need to computerize much of the mail order business, the company has begun the process by tasking you, the systems analyst, to help define the logical structure of the system. Being the proficient and conscientious you begin immediately to produce: (a) and Entity Relationship for each data object, (b) a (level 3?) data flow diagram and supporting PSPECS outlining information flow, (c) a state transition diagram that captured the “externally perceived” behavior of the system, and finally (d) a data dictionary providing a characterization of the data objects.