



Software Requirement Specification

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1 Introduction

This document serves as a preliminary software requirement specification for International Drug Store (IDS) project (Project ID: 144_1_IDS) developed by Team1 for 22C:144 Introduction to Database Systems. It consists of an overview of IDS mission and analysis of customer requirements from software design perspective, followed by data model ERD and design explanation. At the end of this document, a preliminary website prototype is given and constraints of IDS are specified.

1.1 Purpose of Document

This document presents the Software Requirement Specification (SRS) for the IDS Project (Project ID: 144-1_IDS). This document specifies all the deliverable user requirements from a software system perspective. As IDS Team1 is aware of the relatively stringent development time and human resources, this document categorizes user requirements into 3 categories: User specified, Bonus, Advanced. Each category directly relates to certain priority in IDS implementation. For analysis detail, please go to Section 2.

The acceptance of this document by both the customer and development team serves as an informal agreement of deliverables between the customer and IDS Team 1. It's realized that certain software requirements specified in this document are subjective to change during development stage.

1.2 Goals and Objective

The Project involves building a website for an online drug store (IDS). IDS is a web-based online drug store that allows for patients to order drugs to fill prescriptions, track the status of placed orders, and offers basic ordering process security. The system also supports internal use by pharmacists who receive customer inquiries over the phone for quotes, orders, and order status information and who maintain the product and customer database.

1.3 Major Constraints

As it's stated in Section 1.1, one of the greatest challenge IDS Team1 is facing is the rather stringent development time and resources. Due to this potential risk, IDS Team1 will categorize the customer requirements so that during the development cycle, basic requirements are completely fulfilled while bonus features are implemented as much as possible.

In order to achieve this, IDS' data model design should fulfill all the basic requirements while remain pretty scalable to incorporate add-in functionality.

2 User Requirement Analysis

This section provides an analysis of all the user requirements stated in Project Plan Section 2.3. It categorizes user requirements into 3 categories: User specified, Bonus, Advanced. Each category directly relates to certain priority in IDS implementation. The priorities of all the requirements are show in Table 1.

Table 1 Requirement Priority

Icon	Requirement Category	Priority
US	User Specified	Customer required, must deliver
B	Bonus	Team1 will try to deliver when additional time and resources are available
A	Advanced	Unlikely to deliver

For each requirement, an ID is assigned to facilitate tracking down user requirement to specific design and implementation detail.

2.1 User Profiles

User Group: This online facility can be used by anyone in the United States as well as in Canada, but not available in any other country. The user group may be divided into two categories.

1. External users: customers who are ordering drugs.
2. Internal users: pharmacists who take customer orders and inquiries over the phone. Finally, internal system users are IT personnel responsible for the maintenance of the database.
3. Agent: This refers to a person who helps a customer to order any drugs online and thus, get commission from the order.

2.2 User Requirements for External User

ID	Category	Description
ER1	US	Identification through user id and password
ER2	US	To maintain (enter/update/delete) prescription and doctor information for patients – conformation of prescription is done by the IDS staff offline
ER3	US	To maintain patient information including password, phone, shipping address etc.
ER4	US	To allow for online entry of drug orders and tracking of order shipping status
ER5	US	To maintain (enter/update/delete) patient medical and drug histories.
ER6	US	To be able to use shopping cart when making orders
ER7	US	To be able to search for drugs based on partial/complete name (common/medical)
ER8	US	To perform quick browsing using the first letter of drug names
ER9	US	To produce a patient report listing all the orders/prescriptions they have made over a given timeframe.
ER10	US	To allow a user to save a shopping cart and remember it when they return to the site. One user should have one and only one shopping cart.
ER11	B	To allow a user to retrieve their forgotten user id/password using their e-mail address
ER12	B	To use previous patient orders to allow a rapid refill of prescriptions (by using information from the last order(s)) and information from the prescription
ER13	B	To implement credit card processing that allows credit cards to be processed on a web site
ER14	A	To allow a user to place one order for multiple people at the same shipping address.
ER15	A	To only allow multiple people shipping to the same address be implemented on a family basis

2.3 User Requirements for Internal User

ID	Category	Description
IR1	US	Identification through user id and password
IR2	US	To maintain information on prescription drugs including suppliers, prices, description and recommended dosages by manually modifying using the interface
IR3	US	To allow a user to enter patient information to the database given over the phone indirectly through Internal User
IR4	US	To allow a user to enter patient order information given over the phone indirectly through Internal User
IR5	US	To allow a user to track order status information requested over the phone
IR6	US	To produce a quote on drug prices when drugs were given over the phone
IR7	US	To produce a report on all customers currently in the system
IR8	US	To produce a report on all order totals on a daily, weekly, monthly, and annual basis
IR9	B	To produce a report on revenues on all orders on a daily, weekly, monthly, and annual basis
IR10	B	To save order given over the phone or by the user on the website so that they may be later ordered
IR11	B	To maintain drug information and prices by automatically updating data based on data in a text file which is compared to existing data in the database
IR12	B	To produce a sales report that lists the top selling drugs
IR13	B	To produce a sales report that lists the customers that have placed the most orders

IR14	B	To track the most popular drugs and make them easier to order on the web site
IR15	A	To compare the prices of other competitors and produce a report
IR16	A	To produce any advanced report such as a report breaking down the orders by customer region

2.4 User Requirements for Agent

ID	Category	Description
AR1	A	allows for affiliates (marketers) to enter customers, orders, and status information
AR2	A	To automatically calculate commissions of affiliates using information in the database
AR3	A	To produce reports for affiliates showing customer information, order statistics, and their commissions
AR4	A	To produce a report summarizing affiliates order information

2.5 Analysis

The ranking of requirements are done through Section 2.2 ~ 2.4. Notice that many functions required are generally overlapped as shown below and they will affect the order of actual implementation.

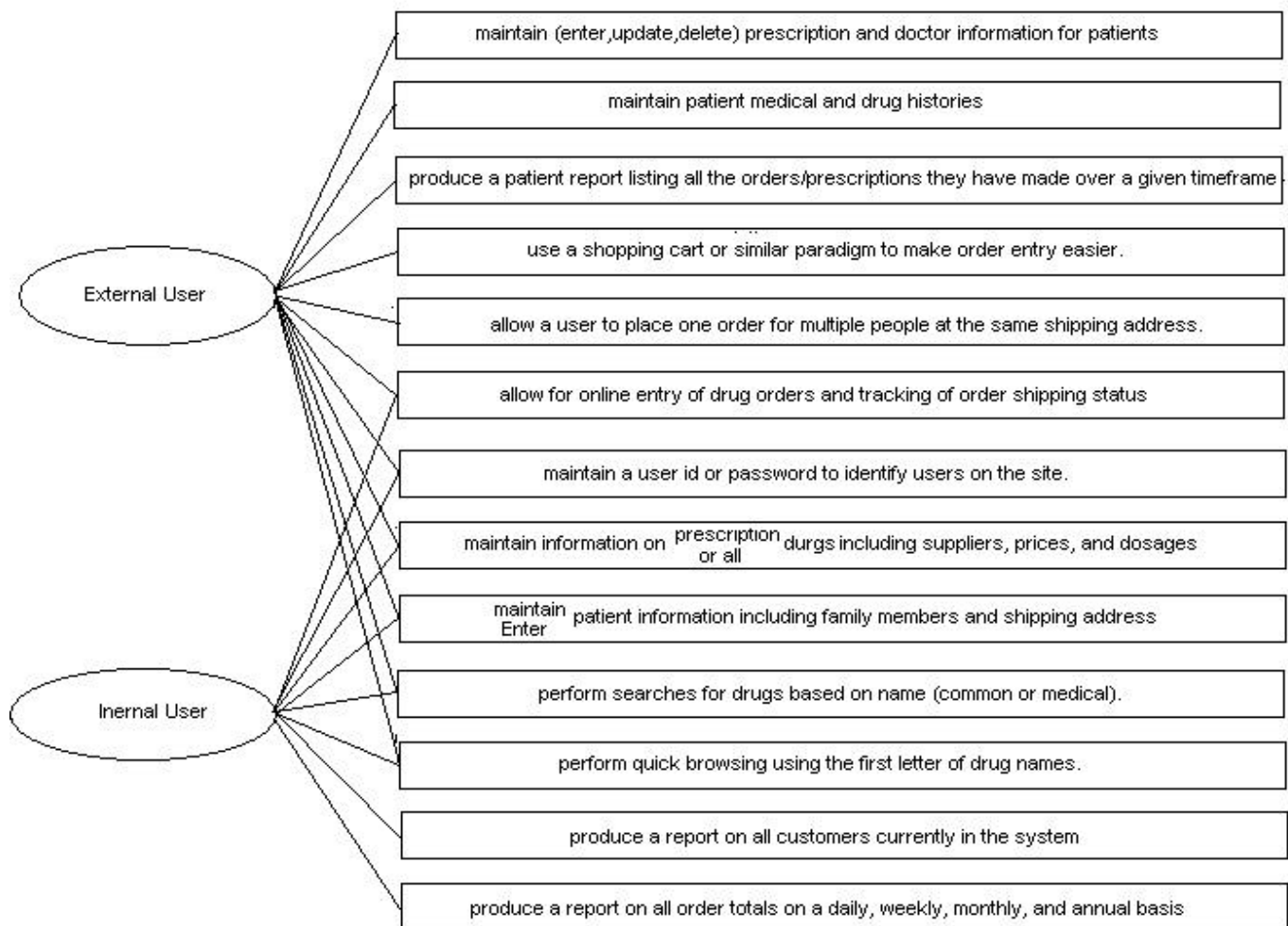


Figure 1 Requirements Overlap

3 Data Model and Description

3.1 Entity Description

3.1.1 Customer

They are the main users of the online drug store. To be able to use this system the customer must first register with a user name and password online i.e. fill in all their information about prescription, doctor information and order drugs online. For the purpose of verification they will have to mail in their prescription. Customer can update, delete all their information including password, address and phone number, etc.

3.1.2 Agent

This refers to a person who helps a customer to order any drugs online and thus, get commission from the order the customer paid.

3.1.3 Supplier

A supplier is a company who supplies drugs. One supplier can supply more than one drug. And one drug can be supplied by more than one company.

3.1.4 Doctor

Each Customer will have one or more doctors. A doctor can give more than one prescription. All the information about a doctor is very important because the pharmacy staff have to confirm with the doctor, that the customer has filled in the right prescription and the right amount of refills.

3.1.5 Account

This includes Account Number, Password and the Type. Type of account includes "Customer", "Agent", "Doctor" and "Administrator".

3.1.6 Prescription

This is filled by the customer and confirmed by the pharmacy staff. It can also be filled in by a pharmacy staff over phone. A prescription should have doctor's confirmation, the drug name, refills if any, and customer's name.

3.1.7 Drug

The main data stored for this table is all the information about the drugs.

Some drugs have other medical names, side effects etc. So before any customer orders the drug online he or she can read all the description that is provided along with the drug name. Any customer can also find out about any drug that is new in the market.

3.1.8 Order

Each customer can place an order online by signing in or also place an order via a staff member (administrator, also known as internal user) by phone. They can fill in the prescription and order for the required drugs. All the members of a single family can place a single order (several orders shipped to one address). Additional data stored will include Date (on what date it was placed), Tracking number, which will help the customer to track their orders, Total, Shipping Status, which will be helpful to find the current status of the order, Shipping Date (when it was shipped out), Shipping Fees, the Address where the order was shipped etc.

3.1.9 MedicalHistory

This will be helpful for the staff to look for any particular drug, if they knew about a customer's medical background, i.e what drug he was taking or what illness he was suffering from.

Note: the implementation detail of this entity is delayed for later stage of development, IDS Team-1 knows more about what should constitute a Medical History.

3.1.10 ShoppingCart

Whenever a customer logs in his account and starts to order the drugs, it should be easy for him to remember what all he wants to order. So use of a shopping cart will make order entry easier for the customer.

Note: the shopping cart referred here is not a whole bunch of drugs that customer “bought” but not paid; instead, for every kind of drug the customer “bought” yet paid, there is a shopping cart constructed for this particular product containing the exact information about this drug (unit price, quantity) when the customer added it to the shopping cart.

Each time a customer finishes with his order, goes to the checking out page and makes the payment, the shopping cart information is saved in Order and OrderDetails.

3.2 Entity and Attributes

Entity	Attributes
Customer	<u>cID</u> , cName, sex, birthdate, cHome, cOffice, cCell, cStreet, cCity, cState, cZIP, cEmail
Agent	<u>aID</u> , aName, aPhone, aStreet, aCity, aState, aZIP, aEmail
Supplier	<u>sID</u> , sName, sPhone, sWebsite, sStreet, sCity, sState, sZIP, sEmail
Doctor	<u>docID</u> , docName, docAffiliation, docPhone, docStreet, docCity, docState, docZIP, docEmail
Account	<u>acNumber</u> , acPasswd, acType
Prescription	<u>pID</u> , cID, docID, pDate, pDisease, pConfirm
Drug	<u>dID</u> , upc, dName, dMedName, dDiscription, dRecDosage, dUnitPrice
Order	<u>oID</u> , oDate, oTrack, oTotal, oShStatus, oShDate, oShFee, oStreet, oCity, oState, oZIP, oName
MedicalHistory	<u>mID</u> , mDate, mDisease
ShoppingCart	dName, odUnitPrice, odQuantity, odSubtotal

3.3 Relationships

- There is a relationship “Has” between Customer and medical History. A customer's health information is stored in multiple MedicalHistory
- There is a relationship “Reserve” between Customer and Shopping cart. A customer can place items in the shopping cart and pay for all of them at the end of shopping. Notice that as the shopping cart is implemented on one cart per drug level, one customer might have multiple shopping carts at the same time.
- There is a relationship “PreOrder” between Drug and Shopping cart. Each shopping cart relates to a particular kind of drug ordered by a particular customer and records the exact information of the drug (name, unitprice, etc.) at the time when customer placed it into shopping cart.
- There are two relationships “Write” and “Confirm” between Doctor and Prescription. Doctor writes prescriptions for a patient (customer). He specifies what drug to be taken, its dosage and refills if any. A doctor can write more than one prescription. Doctor also needs to confirm the prescriptions entered by the customer and saved in IDS.
- There is a relationship “Place” between Customer and Order. A customer places an order. It can be more than one order for each customer. Order will have order details as well as all shipping details.
- There is a relationship “Contain” between Order and Drug. An order contains of multiple drugs. When a customer places an order, he fills the drug details i.e which drug he wants to order. One order can contain many drugs.
- There is a relationship “Supply” between Drug and Supplier. A supplier is a company that supplies drugs. One supplier can supply many drugs, and one drug can be supplied by many suppliers.
- There is a relationship “Comprise” between Prescription and Drug. A prescription contains multiple drugs. When a doctor writes prescription for a patient, it contains drug and dosage, quantity, refill for that particular drug. One prescription can have many drugs while a particular drug may appear in multiple prescriptions as well.
- There is a relationship “Has” between Customer and prescription. A customer can fill in the prescription which has all the details about the drug and the doctor who wrote the prescription.
- There is a relationship “Login” between Customer and Account, it also exists between Agent and Account. Each customer/agent can have a single account to sign in IDS.

3.4 Complete Data Model

Figure 2 shows the UML version of the complete data model.

Figure 3 shows the traditional ER diagram equivalent of the same data model within IDS.

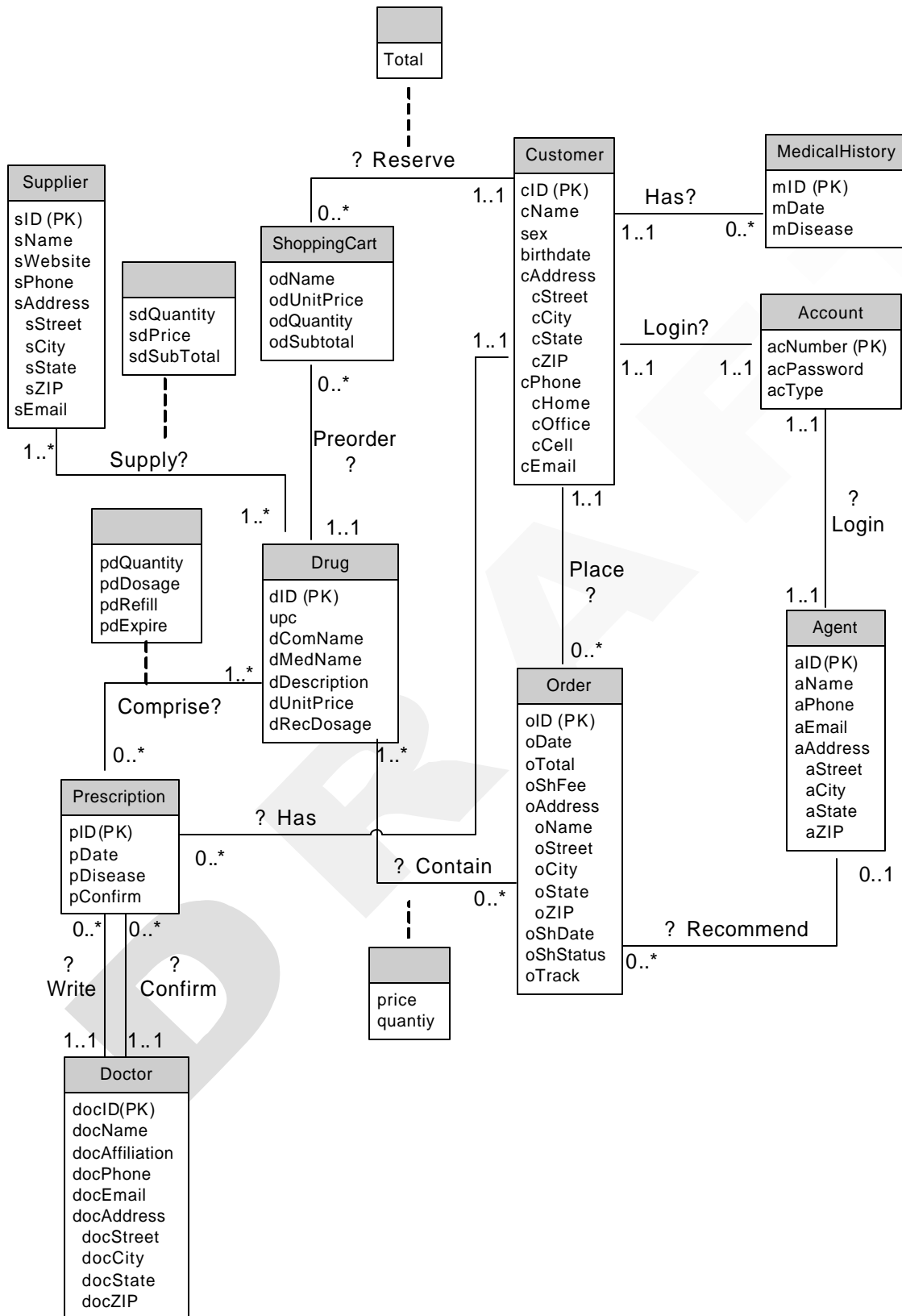


Figure 2 Data Model (UML)

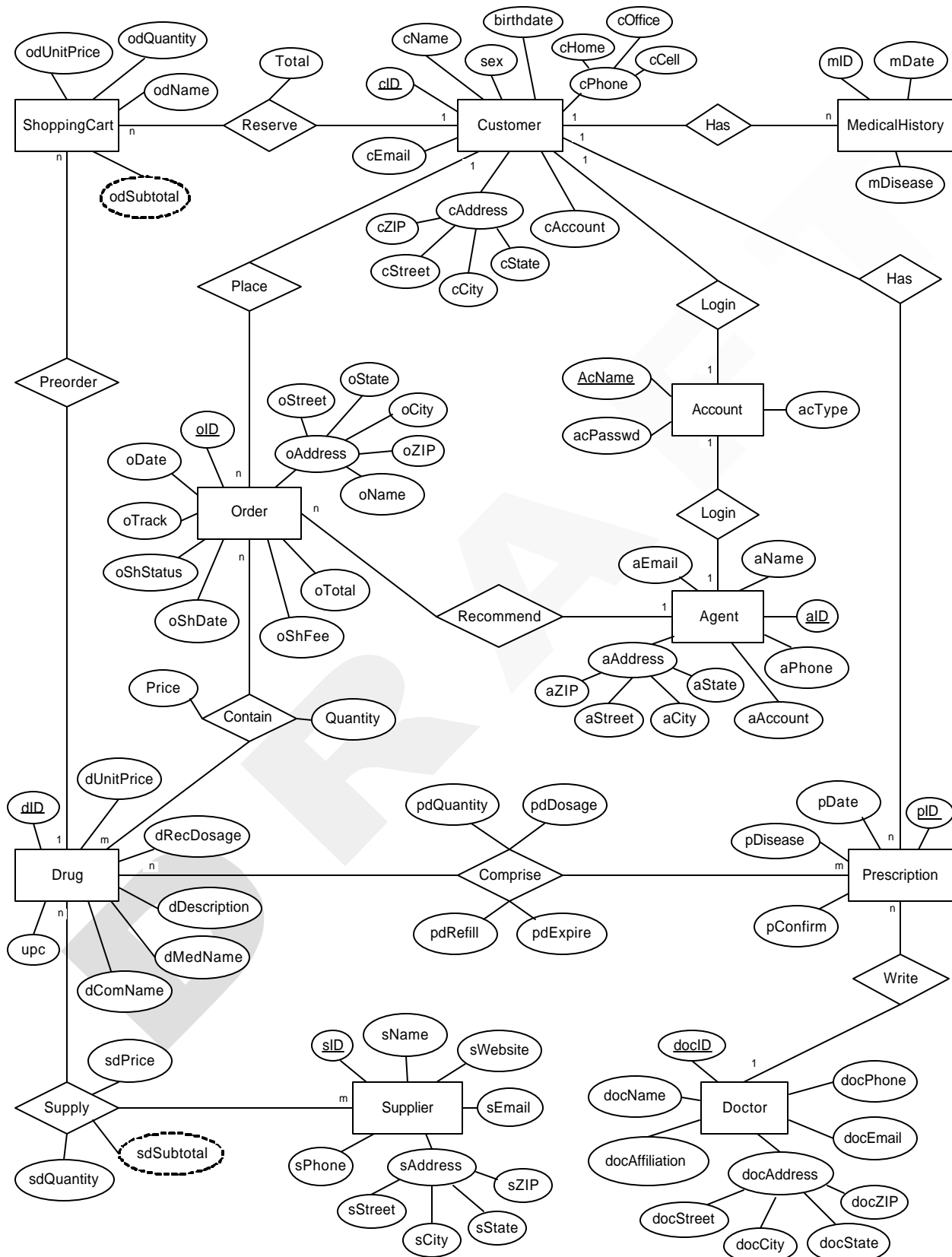


Figure 3 Data Model (ERD)

4 Data Model Explanation

This section includes all the different types of transactions like update, delete, enter some data and retrieve data using SQL Queries. We can achieve these things as follows.

1. List the details of all the customers.

In this above statement we can see that we need to retrieve all the information about the customer from the entity Customer.

2. Update or Delete any prescription and doctor information for patients.

For this we need to update or delete information from entity Doctor, Prescription. So we can see that there is a relation between doctor and prescription.

3. Enter the details of the new customer.

Insert data into all fields of the Customer entity. Similarly other things can be entered into any of the other tables, like enter new patient order information. Then enter the details of the new agent. Enter the details of the new supplier that may supply any drug. Enter the details of the new doctor for an old or new customer. Enter the details of the new prescription information for customer.

4. Perform searches for drugs based on name.

For getting the right result we can see that we have to search in the Drug entity for the given name or part of the name.

5. Produce a patient report listing all the orders/prescriptions they have made over a given timeframe.

For this particular query we will have to perform a join between Customer, Order and Prescription. For such queries we will have to relate all three tables together.

6. Produce a quote on drug prices when drugs were given over the phone.

We should search UnitPrice for that drug from the Drug table.

Similarly most of the US functions specified in Section2 can be done through the data model created. As further discussion on them would actually go to a more low level design issue, we delay the detail explanation of the model into High Level and Low Level Design.

5 Software Interface Description

5.1 External Machine Interface

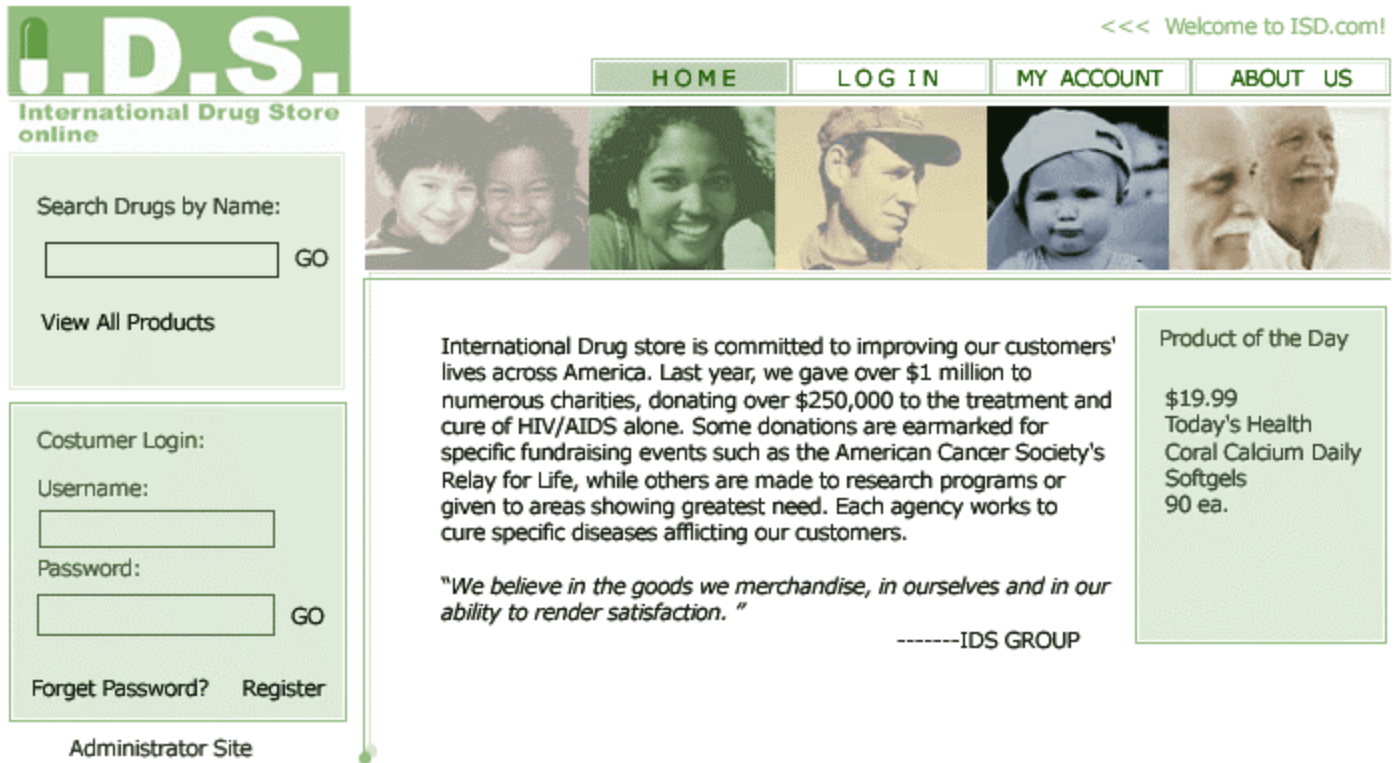
No external machine interface requirement is available of IDS.

5.2 External System Interface

IDS Team1 is using SQL server as back-end database on idealab5.cs.uiowa.edu. Development is conducted mainly using JDBC through connection with idealab2.cs.uiowa.edu. It's possible to debug locally and test on idealab2 using file transfer. The whole website can be visited publicly and final testing will be done externally to achieve maximum efficiency.

5.3 Human Interface

An “open-end” prototype of IDS’ homepage is provided in Figure 2 for better understanding of the final software product.



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Figure 4 IDS Homepage Prototype