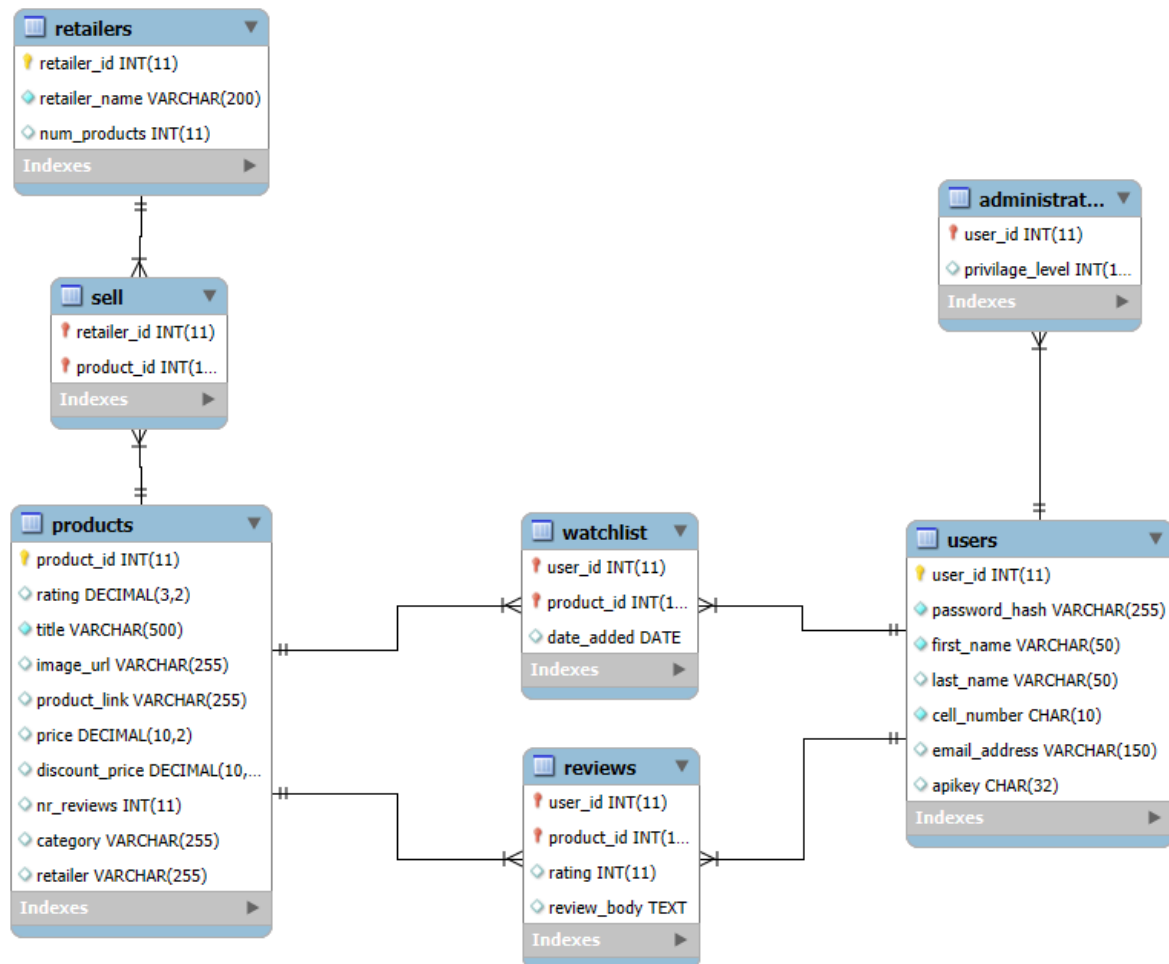# Task 4 : Relational Schema

Task 4 demonstrates the practical implementation of the relationships between entities. This implementation was guided by our EER diagram and its corresponding mapping. The mapping was followed as closely as possible, within practical limits.

SQL Workbench visualisation - To Be Updated with final database schema

The following SQL dump outlines the implementation of primary , secondary and foreign key constraints within our database. We have defined attribute data types - both numeric and text fields - to ensure they are appropriately sized for the data they store. We applied relevant constraints to control data input and maintain referential integrity, including the effects that updates and/or deletions have on entities that they share a relationship with.

A short overview of the SQL dump:
All primary keys are required to be unique - we have implemented the necessary uniqueness constraint. The foreign keys in our tables stipulate that no action is required on referenced tables - this is because the removal of an attribute from one relation does not affect the relation extension of the referencing relation.

```sql
/*!40101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT */;
/*!40101 SET @OLD_CHARACTER_SET_RESULTS=@@CHARACTER_SET_RESULTS */;
/*!40101 SET @OLD_COLLATION_CONNECTION=@@COLLATION_CONNECTION */;
/*!50503 SET NAMES utf8 */;
/*!40103 SET @OLD_TIME_ZONE=@@TIME_ZONE */;
/*!40103 SET TIME_ZONE='+00:00' */;
/*!40014 SET @OLD_UNIQUE_CHECKS=@@UNIQUE_CHECKS, UNIQUE_CHECKS=0 */;
/*!40014 SET @OLD_FOREIGN_KEY_CHECKS=@@FOREIGN_KEY_CHECKS, FOREIGN_KEY_CHECKS=0 */;
/*!40101 SET @OLD_SQL_MODE=@@SQL_MODE, SQL_MODE='NO_AUTO_VALUE_ON_ZERO' */;
/*!40111 SET @OLD_SQL_NOTES=@@SQL_NOTES, SQL_NOTES=0 */;


--
-- Table structure for table `administrator`
--

DROP TABLE IF EXISTS `administrator`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!50503 SET character_set_client = utf8mb4 */;
CREATE TABLE `administrator` (
  `user_id` int(11) NOT NULL,
  `privilage_level` int(11) DEFAULT 0,
  PRIMARY KEY (`user_id`),
  CONSTRAINT `admin_user_key` FOREIGN KEY (`user_id`) REFERENCES `users` (`user_id`) ON DELETE NO ACTION ON UPDATE NO ACTION
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;
/*!40101 SET character_set_client = @saved_cs_client */;
```

```
--
-- Table structure for table `products`
--

DROP TABLE IF EXISTS `products`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!50503 SET character_set_client = utf8mb4 */;
CREATE TABLE `products` (
  `product_id` int(11) NOT NULL AUTO_INCREMENT,
  `rating` decimal(3,2) DEFAULT NULL,
  `title` varchar(500) NOT NULL,
  `image_url` varchar(255) DEFAULT NULL,
  `product_link` varchar(255) DEFAULT NULL,
  `price` decimal(10,2) DEFAULT NULL,
  `discount_price` decimal(10,2) DEFAULT NULL,
  `nr_reviews` int(11) DEFAULT NULL,
  `category` varchar(255) DEFAULT NULL,
  `retailer` varchar(255) DEFAULT NULL,
  PRIMARY KEY (`product_id`)
) ENGINE=InnoDB AUTO_INCREMENT=6305 DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;
/*!40101 SET character_set_client = @saved_cs_client */;


DROP TABLE IF EXISTS `retailers`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!50503 SET character_set_client = utf8mb4 */;
CREATE TABLE `retailers` (
  `retailer_id` int(11) NOT NULL AUTO_INCREMENT,
  `retailer_name` varchar(200) NOT NULL,
  `num_products` int(11) DEFAULT -1,
  PRIMARY KEY (`retailer_id`)
) ENGINE=InnoDB AUTO_INCREMENT=5 DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;
/*!40101 SET character_set_client = @saved_cs_client */;

DROP TABLE IF EXISTS `reviews`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!50503 SET character_set_client = utf8mb4 */;
CREATE TABLE `reviews` (
  `user_id` int(11) NOT NULL,
  `product_id` int(11) NOT NULL,
  `rating` int(11) DEFAULT NULL,
  `review_body` text DEFAULT NULL,
  PRIMARY KEY (`user_id`,`product_id`),
  KEY `review_product_key_idx` (`product_id`),
  CONSTRAINT `review_product_key` FOREIGN KEY (`product_id`) REFERENCES `products` (`product_id`) ON DELETE NO ACTION ON UPDATE NO ACTION,
  CONSTRAINT `review_user_key` FOREIGN KEY (`user_id`) REFERENCES `users` (`user_id`) ON DELETE NO ACTION ON UPDATE NO ACTION
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;
/*!40101 SET character_set_client = @saved_cs_client */;


DROP TABLE IF EXISTS `sell`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!50503 SET character_set_client = utf8mb4 */;
CREATE TABLE `sell` (
  `retailer_id` int(11) NOT NULL,
  `product_id` int(11) NOT NULL,
  PRIMARY KEY (`retailer_id`,`product_id`),
  KEY `sell_product_key_idx` (`product_id`),
  CONSTRAINT `sell_product_key` FOREIGN KEY (`product_id`) REFERENCES `products` (`product_id`) ON DELETE NO ACTION ON UPDATE NO ACTION,
  CONSTRAINT `sell_retailer_key` FOREIGN KEY (`retailer_id`) REFERENCES `retailers` (`retailer_id`) ON DELETE NO ACTION ON UPDATE NO ACTION
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;
/*!40101 SET character_set_client = @saved_cs_client */;
```

```sql
DROP TABLE IF EXISTS `users`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!50503 SET character_set_client = utf8mb4 */;
CREATE TABLE `users` (
  `user_id` int(11) NOT NULL AUTO_INCREMENT,
  `password_hash` varchar(255) NOT NULL,
  `first_name` varchar(50) NOT NULL,
  `last_name` varchar(50) DEFAULT NULL,
  `cell_number` char(10) NOT NULL,
  `email_address` varchar(150) DEFAULT NULL,
  `apikey` char(32) DEFAULT NULL,
  PRIMARY KEY (`user_id`),
  UNIQUE KEY `email_address` (`email_address`)
) ENGINE=InnoDB AUTO_INCREMENT=2 DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;
/*!40101 SET character_set_client = @saved_cs_client */;

DROP TABLE IF EXISTS `watchlist`;
/*!40101 SET @saved_cs_client     = @@character_set_client */;
/*!50503 SET character_set_client = utf8mb4 */;
CREATE TABLE `watchlist` (
  `user_id` int(11) NOT NULL,
  `product_id` int(11) NOT NULL,
  `date_added` date DEFAULT NULL,
  PRIMARY KEY (`user_id`,`product_id`),
  KEY `product_watchlist_fkey_idx` (`product_id`),
  CONSTRAINT `product_watchlist_fkey` FOREIGN KEY (`product_id`) REFERENCES `products` (`product_id`) ON DELETE NO ACTION ON UPDATE NO ACTION,
  CONSTRAINT `user_watchlist_fkey` FOREIGN KEY (`user_id`) REFERENCES `users` (`user_id`) ON DELETE NO ACTION ON UPDATE NO ACTION
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;
/*!40101 SET character_set_client = @saved_cs_client */;
```