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Project 5 Report

ER Model

The important feedback on our ER model specified eliminating the SEARCHES\_FOR relationship, a “Category” attribute in the TECHNOLOGY\_PART entity, and replacing the USER\_SELLS and USER\_BUYS relationships with a ternary relationship between USER and TECHNOLOGY\_PART. We are keeping the SEARCHES\_FOR relationship because we want to record people's searches and use machine learning to implement product recommendations. We added a “Category” attribute to the TECHNOLOGY\_PART entity because it provides more information to the diagram. Having this attribute allows users to query the database for a specific item, like a processor or graphics card, which is an important feature we want in our database. We also added a “Category” attribute to the DEVICE entity for the same purposes (more information and it provides a search filter). We added an attribute “Seller\_ID” to the TECHNOLOGY\_PART entity so that the database records the owner of each part listed in the database. This would allow for filtering queries by seller so a user will only see the parts owned by a specific seller. We replaced the relationships USER\_SELLS and USER\_BUYS with a ternary relationship, TRANSACTION, between USER and TECHNOLOGY\_PART. The USER entity is in a self-referencing relationship where the roles are “Buyer” and “Seller”. This simulates two separate entities participating in the ternary relationship. All entities have total participation since there must be a buyer, a seller, and a part for each transaction. Also, this is a 1:1:1 relationship because there can only be one of each per transaction. This relationship has a “Date” attribute so we can record when each sale happens. Also, we introduced a surrogate Primary Key “ID” to the relationship so that every transaction is unique and differential from every other transaction. We considered adding a “Sale\_Price” attribute to the relationship so we can query how much a part was sold for. However, adding this attribute would be redundant because TECHNOLOGY\_PART participates in the relationship and has a “Price” attribute.

Relational Model

In the relational model, the feedback we received concerned the TRANSACTION relation replacing the USER\_BUYS, USER\_SELLS, and VENDOR\_SELLS relations. The feedback suggested that we replace the three relations with the first for simplicity and so that we would have a better visualization of the relationship between users (acting as both buyers and sellers) and technology parts. Taking into account this feedback, in the relational model we got rid of the USER\_BUYS, USER\_SELLS, and VENDOR\_SELLS relations and created a new relation called TRANSACTION. We introduced a new surrogate key called Transaction\_ID that serves as the primary key for the TRANSACTION relation so that the primary key wasn’t contained over four different attributes. TRANSACTION also includes the simple attribute Transaction\_Date that keeps track of the time at which the transaction was made. The feedback also mentioned the creation of a User Type attribute in order to better define the user entity. To address this a new attribute was created in the USER relation, User\_Type, that will hold the type of user (vendor, general user, collector, etc.). The changes and additions we made to the ER model were also reflected in the relational model, including the additional Category attributes to the Technology\_Part and Device relations, the addition of Seller\_ID to the Technology\_Part relation, and the addition of address to the EW\_User relation.