Denormalization

- Transforming ***normalized*** relations into ***unnormalized*** physical record specifications
- Benefits:
  - Can improve performance (speed) by reducing number of table lookups (i.e. *reduce number of necessary join queries*)
- Costs (due to data duplication)
  - Wasted storage space
  - Data integrity/consistency threats
- Common denormalization opportunities
  - One-to-one relationship (Fig. 6-3)
  - Many-to-many relationship with attributes (Fig. 6-4)
  - Reference data (1:N relationship where 1-side has data not used in any other relationship) (Fig. 6-5)

Figure 6-3 A possible denormalization situation: two entities with one-to-one relationship

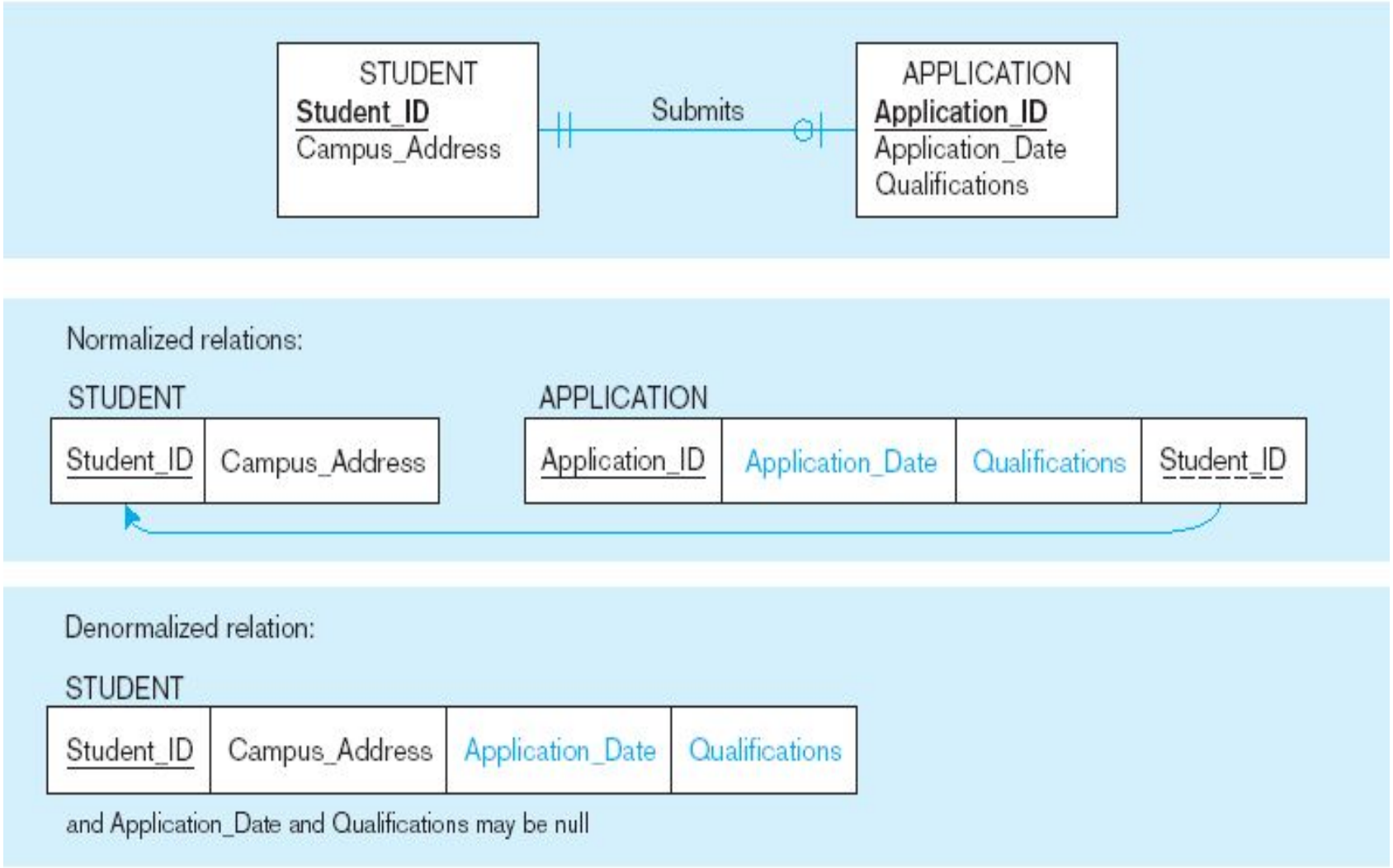

Figure 6-4 A possible denormalization situation: a many-to-many relationship with nonkey attributes

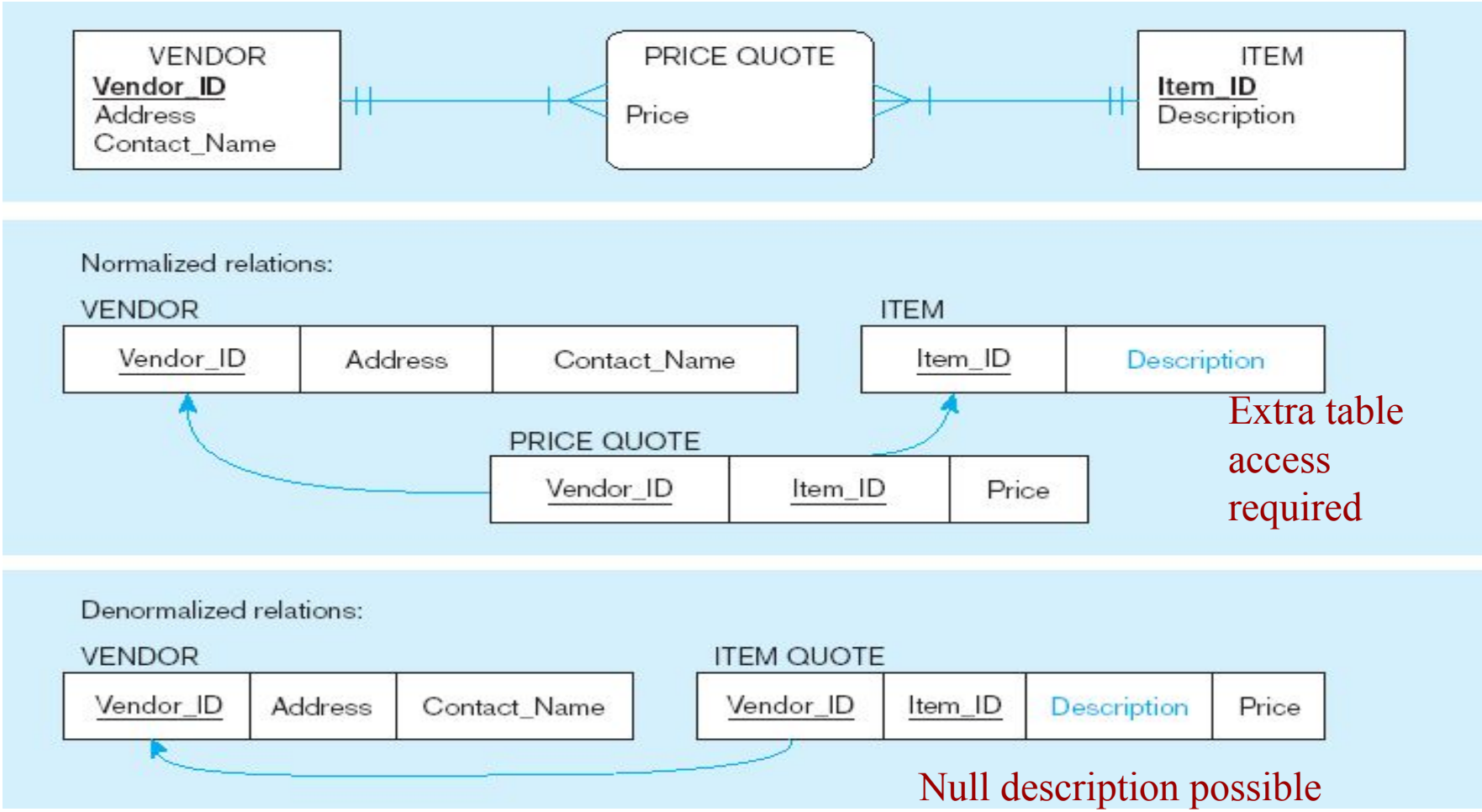

Figure 6-5

A possible denormalization situation: reference data