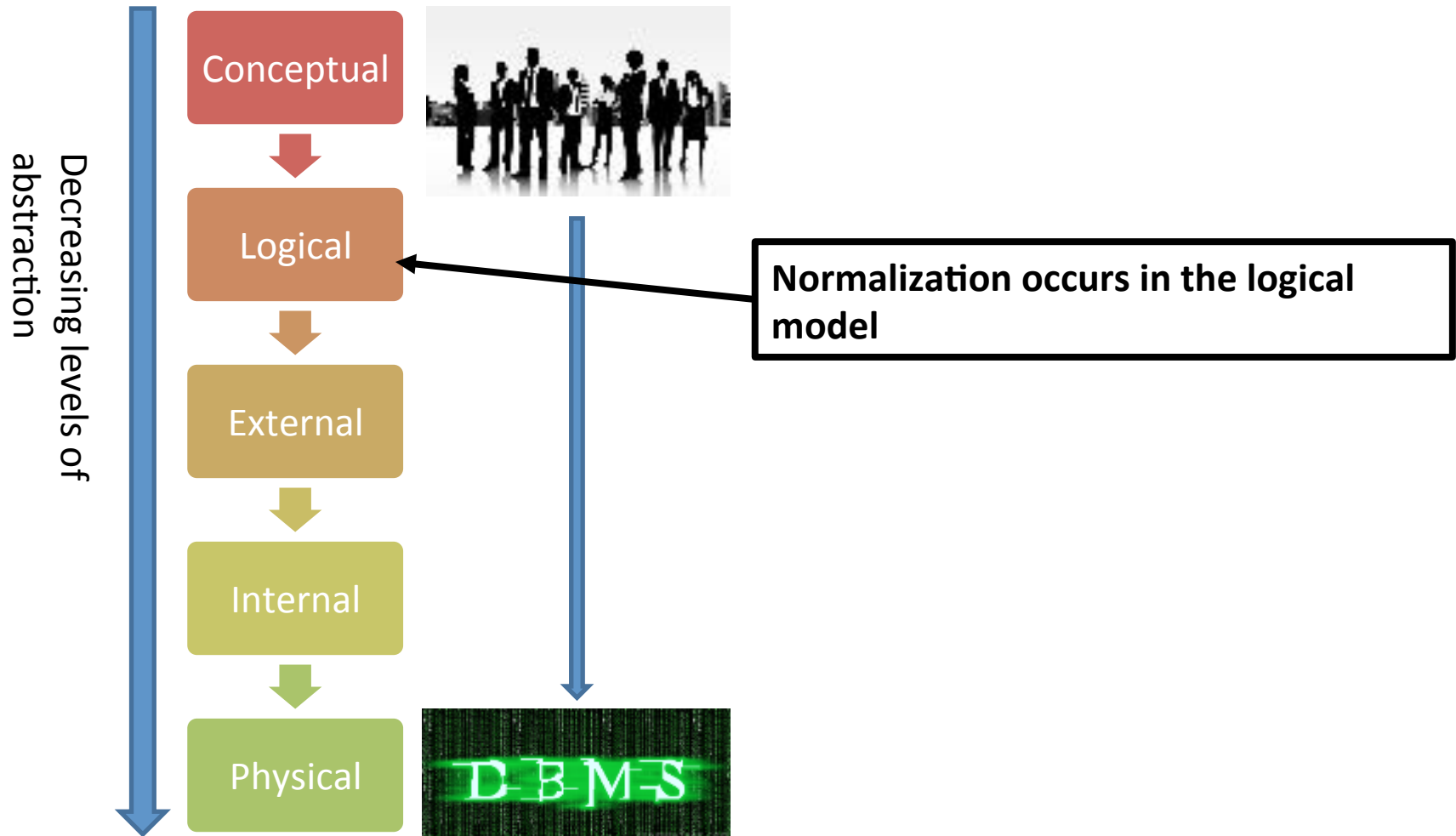


What Is Normalization?

Normalization

- The process of systematically eliminating dependencies in relations
- Reduces data redundancy
- Improves data consistency
- Reduces database maintenance activity

Levels of Data Model Abstraction



Why Normalize?

- To find the most efficient way of storing data
- To eliminate **anomalies**
 - **Insertion anomaly**
 - How can we control what data go into our database? “Family & Friends” vs. “Family and Friends”
 - Normalization ensures data are entered in a controlled fashion according to the business rules.
 - **Update anomaly**
 - How do we ensure that all necessary rows change when needed?
 - Normalization ensures updates happen to all necessary rows.
 - **Selection anomaly**
 - How do we ensure that we are getting all of the relevant rows?
 - Normalization makes the data organized in such a way that we can ensure all necessary rows are read.
 - **Delete anomaly**
 - If we need to remove data, are you sure you got all of it?
 - Normalization ensures that if we remove a record, all instances of that data are removed.

Normalization

Project	Category	Assigned To	Est. Start	Est. Finish	Est. Work	Est. Duration
Project 1	Restrung Basses	Tony Levine	1/4/2013	3/4/2013	210	60
Project 2	Hang lights	Paz Lenchantin	1/20/2013	2/21/2013	400	31
Project 3	Restrung Basses	Frank Bello	2/6/2013	4/16/2013	500	70
Project 4	Unload trailer	Sean Yseult	3/8/2013	3/18/2013	250	10
Project 5	Unload the trailer	Bello, Frank	3/19/2013	4/29/2013	300	40
Project 6	Set up sound	Paz Lenchantin	4/10/2013	4/20/2013	500	10
Project 7	Sound Check	Tony Levin	4/18/2013	5/12/2013	750	24
Project 8	Dress Rehearsal	Tony Levin	5/12/2013	6/22/2013	450	40



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