Data Modeling By SkyEss

Synopsis of Different Data Models

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Basic Concepts of Conceptual Data Model

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- The Conceptual Data Model is Represented At High Level OR Considered General Level of The Business Process Implementation.
- Conceptual Data Model is Mainly Intended To Be Acting As A Communication Tool With The User Community in The Business Environment.
- In Conceptual Data Model, We Should Not Give Any Priority For Details of Data Structures OR For Any Considerations of Hardware And Database Software.
- Conceptual Data Model Should Not Address Any Thing About Final Database System That is Going To Be Implemented As A Relational Database System OR Any Other Type of Database System.
- The Conceptual Data Model Should Be Complete By itself And Should Include Sufficient Components To Be A True Representation of The Information Requirements of The Organization.
- The Conceptual Data Model Should Have Representations For The Business Objects of The Business System, And Should Project A Connection Between The External Data Model And The Conceptual Data Model.
- The Conceptual Model Should Indicate The Relationships Among The Business Objects in The System.

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Note

- In The Real World Implementations, Business Objects in An Organization Do Not Exist As Separate Entities; They Are Related With One Another And Interact With One Another.

- In Order To Serve As A Communication Tool With The Users, The Conceptual Data Model Should Have Easily Understood Notations Or Symbols While Representing The Components Of The Model.
- Conceptual Data Model Should Have A Representation That Can Represent A Relationship Between Any Two Objects That Are in The Process of The Business.
- In Conceptual Data Model The Data Modeler First Keep His Priority in Analyzing The "User Groups" From The Actual Business System.
- The "User Groups" Should Be Identified As Per The Data Analyzed in The External System, As Operated in The Business System.
- The Data Modeler Should Have Skill Sets To Organize And Reorganize The Data As Identified in The Business System Through Classifications of The Business Areas.
- In Practical Sense The User Groups Represent The Roles With Which The Business Operations Are Carried Out By The Human Resource That Operate OR Conduct The Business Process As Per The Standards of The Business Requirements.

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Visualizing The External Data Model

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User Groups in Business

Accounting

Marketing

Inventory Control

External Data Model

Customer Number
Name
Street Address
City Name
State Name
Zip Code
Sale Number
Sale Date
Sale Total
Product ID
Unit Cost
Unit Price

Customer Number
Name
Phone Number
Sale Number
Sale Date
Sale Total
Product ID
Product Description
Number of Units

Name
Phone Number
Sale Number
Sale Date
Product ID
Number of Units
Shipment Method
Special Instructions

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Visualizing The Conceptual Data Model

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User Groups in Business

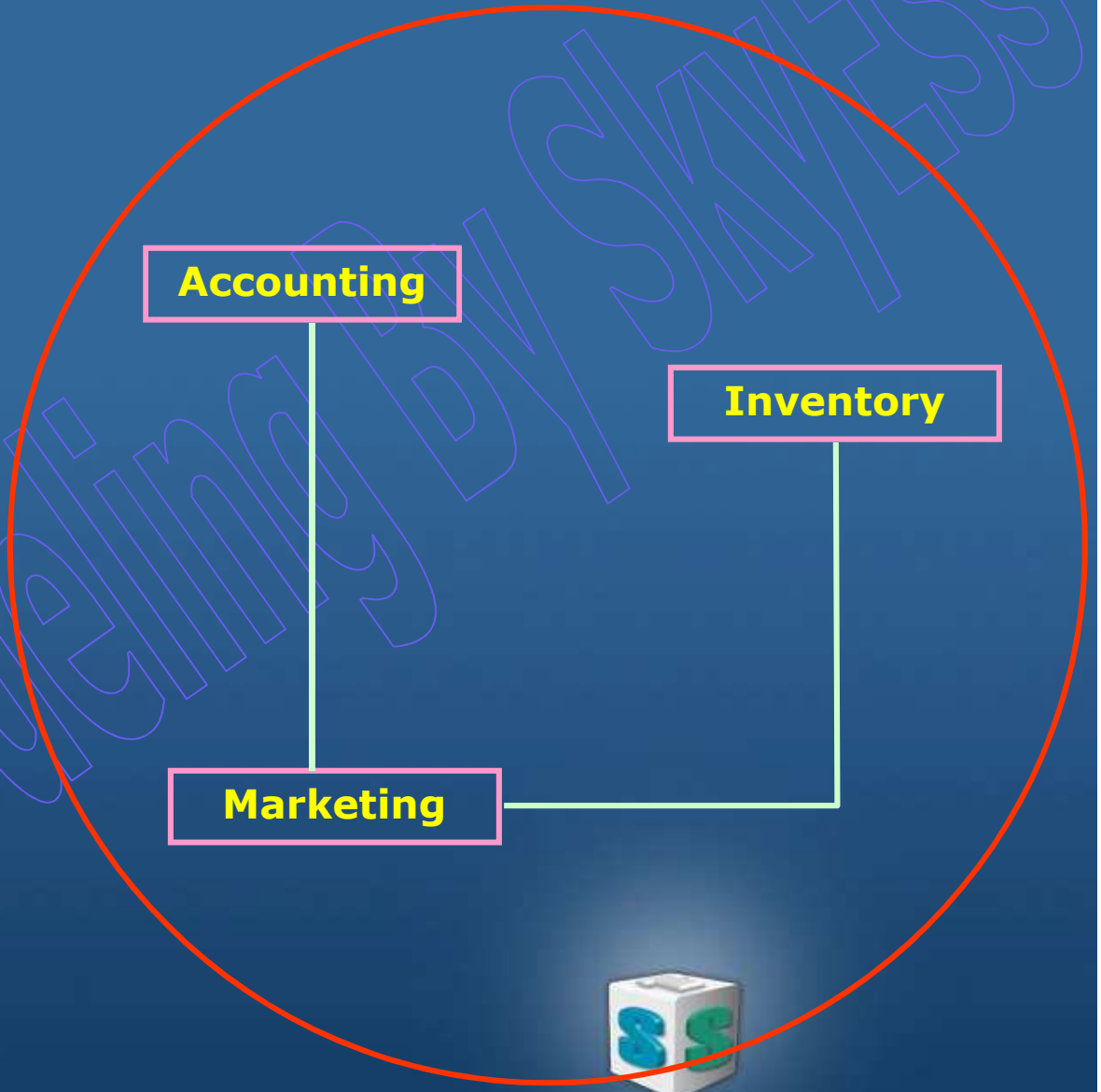
Accounting

Marketing

Inventory Control

Aggregation

Conceptual Data Model



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Basic Concepts of Logical Data Model

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- The Logical Data Model Which is Derived on The Context of Conceptual Data Model Represents The Information Requirements in The Form of Two-Dimensional Tables With Rows And Columns.
- The Logical Data Model Speaks About The Entity Names And The Corresponding Attributes And Standard Data Types, Constraints And Cardinalities That Will Be Encountered By The Database Developer. .
- The Logical Data Model is The Nearest Composition To The Physical State With Which The System Exists in The Context of Database Management System.
- Logical Data Model Also Covers Some Level of Aspect To The Normalization Standards That May Be Essential To Keep The System in Consistency.
- All The Key Columns And The Business Associations That Are Essential in The System Are Almost Identified And Confirmed in The Logical Data Model.
- Logical Data Model Gives Clarity To Both The End User And The Database Developer Regarding The Actual Components That Exist Finally in The System.
- The Logical Data Model May Serve As A Purpose of Communication Tool And Can Even Act As A Blue Print To The Database Developers, Database Administrators And The Database Architects At A Time..

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Visualizing The Logical Data Model

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External Data Model

Customer Number
Name
Street Address
City Name
State Name
Zip Code
Sale Number
Sale Date
Sale Total
Product ID
Unit Cost
Unit Price

Customer Number
Name
Phone Number
Sale Number
Sale Date
Sale Total
Product ID
Product Description
Number of Units

Aggregation

Name
Phone Number
Sale Number
Sale Date
Product ID
Number of Units
Shipment Method
Special Instructions

Logical Data Model

Customer

Customer Number
Name
Street Address
City Name
State Name
Zip Code
Phone Number

Product

Product ID
Product Description
Unit Cost
Unit Price
Number of Units

Sales

Sale Number
Sale Date
Sale Total
Shipment Method
Special Instructions

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Basic Concepts of Physical Data Model

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- A Physical Data Model Has Little Use As A Means of Communication Tool With The End Users OR Business Users.
- The Physical Data Model's Primary Purpose is To Act As A Blueprint For The Implementation of The Database Management System.
- The Details Contained in A Physical Data Model Are Beyond The Normal Comprehension of The End Users OR Business Users.
- The Physical Data Model Expresses Too Many Intricate Details of The Business System in The Criteria of The Database Management System Standards And Strategies.
- Physical Data Model Includes Considerations of The Particular Database Management System(DBMS) And The Hardware Environment in Which The Database System Gets Implemented.
- The Physical Data Model Represents The Information Requirements in Terms of
  - Database Tables
  - Relations And Constraints And Cardinalities
  - Indexes
  - Logical Tables Called Views
  - Files
  - Data Blocks
  - Records
  - Fields
- The Physical Data Model is A Representation At The Lowest Level of Abstraction With A Lot of Complex Details.

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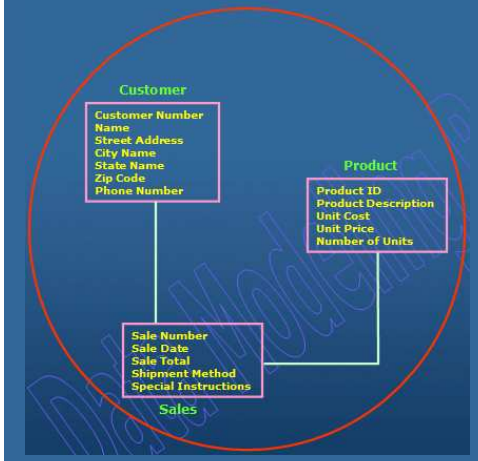
Logical Data Model



Physical Data Model

Customer

CustNum NUMBER(6)
Name VARCHAR2(15)
ST_Addr VARCHAR2(100)
City_Name VARCHAR2(30)
State_Name VARCHAR2(30)
Zip_Code CHAR(6)
PH_Number CHAR(13)

Product

Prod_ID NUMBER(6)
Prod_Desc VARCHAR2(200)
Unit_Cost NUMBER(10, 2)
Unit_Price NUMBER(10, 2)
Num_of_UNTS NUMBER(5)

Sales

Sale_Num NUMBER(6)
Sale_Date DATE
Sale_Total NUMBER(10, 2)
Ship_Method VARCHAR2(20)
SP_Inst VARCHAR2(200)

Logical Data Model

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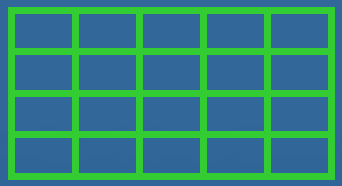
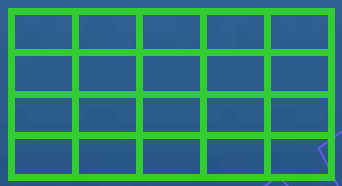
Logical Data Model

Relational Tables

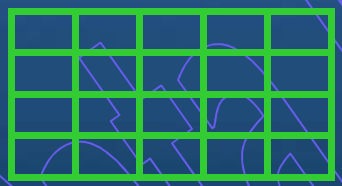
Customer



Product



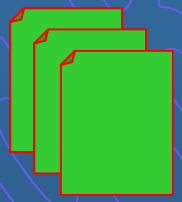
Sales



Physical Data Model

Database Storage

Files



Records

Fields

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