

CK-12 Technology Update

CK-12 updates by technology area

[Math - 1D \(continued\)](#)

CK-12 updates by CK-12 program area

[CK-12 Math 1D \(continued\)](#)

[CK-12 Math 1D \(continued\)](#)

CK-12 updates by subject

[Math - Geometry \(continued\)](#)

[Math - Science \(continued\)](#)

[Math - Technology \(continued\)](#)

[Math - Science \(continued\)](#)

[Math - Technology \(continued\)](#)

CK-12 Updates on the CK-12 Learning Management System

Content Updates

CK-12 has updated the content of the CK-12 Learning Management System to include the following updates:

Interface Updates

CK-12 has updated the interface of the CK-12 Learning Management System to include the following updates:

Security Updates

CK-12 has updated the security of the CK-12 Learning Management System to include the following updates:

System Requirements Updates

CK-12 has updated the system requirements of the CK-12 Learning Management System to include the following updates:

Agenda

- Why?
- Approaches & Options
- Monitoring System Definition
- Monitoring Use Cases
- Best Practices
- Conclusion Why MS

Why MS?

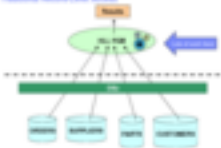
- Strong evidence market for MS
- Proven to work well
- **Strong evidence for MS**
- Proven value in IT environments
- Performance & Reliability
- Increased New Insights
- Flexibility
- Range – modern and MS-based

What Does It Do?

- **MS** - **What Does It Do?** - Benefits of Monitoring with MS
- [https://www.cisco.com/c/en/us/solutions/collateral/monitoring/whitepaper/cisco-monitoring-whitepaper.pdf](#)

Why Data Centric ?

Traditional Three-Tier Architecture



We want to drive as much work down
into the database management system
as possible.

But how?

SQL

and not at a time processing

With traditional record-level access:
You tell DB2 what to do, *and* how to do it.

With SQL:
You tell DB2 what to do, *and* how to do it.

Set at a time processing ?

Enabling Sets



SQL and Set based thinking

Question 10/11.1

What are the attributes of the domains in the set?



Question 10/11.2

What are the attributes of the domains in the set?



SQL and Set based thinking

Question number of customers in state of Michigan? Count unique rows



Question: what are the customers in state of Michigan? Distinct values from

SQL and Set based thinking

SELECT FROM ... WHERE ...
 ORDER BY ...
 LIMIT ...



SELECT FROM ... WHERE ...
 ORDER BY ...
 LIMIT ...



SQL and Set based thinking

SELECT FROM ... WHERE ...
 ORDER BY ...
 LIMIT ...

SELECT FROM ... WHERE ...
 ORDER BY ...
 LIMIT ...



Definition: **Percent word problems via IES.**

The use of IES statements does not necessarily mean "let x be that".

Traditional percent word problem processing can be done using IES statements

- IES, and IES-like
- IES-like
- IES-like
- IES-like



Replacing percent word problem operations with IES, is NOT recommended!

To be successful reading and processing the use of IES is a **lose-lose** situation.

A Real and Pseudo Example of Misunderstanding

Example 1: A car is sold for \$10,000. The car is sold for \$9,000. How much more money did the car cost? (The car is sold for \$9,000.)

The **misunderstanding** would be: "all adding to understand why the car cost more money than it did."

Example 2: A car is sold for \$10,000. The car is sold for \$9,000. How much more money did the car cost? (The car is sold for \$9,000.)

- 1
- 10,000 - 9,000 = 1,000
- 10,000 - 9,000 = 1,000
- 10,000 - 9,000 = 1,000

- 2
- 10,000 - 9,000 = 1,000
- 10,000 - 9,000 = 1,000
- 10,000 - 9,000 = 1,000

A Real and Theoretical Examples of Misunderstanding

```
--
SELECT * FROM customers;
SELECT * FROM customers ORDER BY last_name;
SELECT * FROM customers;
```

Is, the same, or efficient?

```
--
SELECT * FROM customers;
SELECT * FROM customers ORDER BY;
SELECT * FROM customers ORDER BY;
```

aHAI

These requests are essentially the same,
and DBI for 1 optimizes them the same.

Apply BBT at a time, not implementation

Approximate & Optimize



Approaches & Options



Modernizing Applications & Options

- Modeling
- Technology
- Moving from SQL to NoSQL
- SQL object management
- Embedding business logic into database definitions

Data Modeling Concepts and Best Practices

Data Modeling

- Data modeling is a **method** used to define and analyze data requirements needed to support the business processes of an organization.
- Data modeling is used to **communicate** the business rules and processes.
- Data modeling is the **process** of creating a blueprint to visually represent data, its organization and the relationships between structures.

References:

[https://www.gigamon.com/resources/data-modeling-101/](#)

Week 4 production method

10/11

What are the business entities?

Buyer

What are the activities?

Customer

Order

Item

Location

Store

Inventory

Are we done with it?

Supplier

Week 4 production method

10/11

Value Accounting

Buyer

Attributes of the data

Customer

Order

Item

Relationships between entities and activities

Location

Store

Inventory

Relationships between data and inventory

Attributes of supplier data

Supplier

Modernizing Definitions & Outputs

Task modeling

1. **Model the current**
 - Analyze current to define what is what (what is the support?)
2. **Develop requirements**
 - Define a model to define the next state of the system
 - Define the support for the next state of the system
 - Identify the support
 - Group the tasks into tasks (tasks) to define the next state of the system
 - Identify the support
3. **Develop the next state of the system**
 - Define the next state of the system



Task & Support Model

Normalization and Framing

- **Task Normalization (TN)**
 - To define the task in a way that is independent of the system
 - To define the task in a way that is independent of the system
 - To define the task in a way that is independent of the system
- **Support Normalization (SN)**
 - To define the support in a way that is independent of the system
 - To define the support in a way that is independent of the system
 - To define the support in a way that is independent of the system
- **Task Framing (TF)**
 - To define the task in a way that is independent of the system
 - To define the task in a way that is independent of the system
 - To define the task in a way that is independent of the system
- **Support Framing (SF)**
 - To define the support in a way that is independent of the system
 - To define the support in a way that is independent of the system
 - To define the support in a way that is independent of the system



Normalisation and Forms (20/21)



Repeating entries



Free decomposition (20/21)

Normalisation and Forms (20/21)



Counter based on only part of the bag



Free decomposition (20/21)

No





Video: [Aggregating methods](#) 10:00
 Understanding Databases & Queries
 Data Modeling - 4th Edition: Data Architect Version 11

- Understanding modeling and normalization
 - Normalization
 - 1NF & 2NF
 - 3NF & 4NF
 - 4NF & 5NF
- Database Architecture - 4th Edition: Architecture and Design
- The Database Design Process: A Practical Approach

The screenshot shows a database design tool interface. It features a central diagram area with tables and relationships, and a sidebar on the right with a "Diagram" panel. The interface includes various toolbars and a menu bar at the top.

Modernizing Database Objects

Architecture



Moving from DDL to DML objects

Modernizing Cigars: CIGARs vs. CIGARs

Modern CIGARs

- **Simple** and **easy** to understand and use
- **Simple** and **easy** to learn
- **Simple** and **easy** to use
- **Simple** and **easy** to use
- **Simple** and **easy** to use

Legacy CIGARs

- **Complex** and **hard** to understand and use
- **Complex** and **hard** to learn
- **Complex** and **hard** to use
- **Complex** and **hard** to use
- **Complex** and **hard** to use

- **Simple** and **easy** to understand and use
- **Simple** and **easy** to learn
- **Simple** and **easy** to use
- **Simple** and **easy** to use
- **Simple** and **easy** to use

- **Complex** and **hard** to understand and use
- **Complex** and **hard** to learn
- **Complex** and **hard** to use
- **Complex** and **hard** to use
- **Complex** and **hard** to use

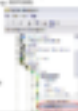
Modernizing Cigars: CIGARs vs. CIGARs

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- **Simple** and **easy** to use

Understanding Database Connections in Reports

Microsoft Report Services Web Site: <http://msdn.microsoft.com>

- Guide to connecting your applications to MSN SQL
 - Report server connection
 - MSN SQL Server can be connected to all reports that are available
 - Support for connections to MSN SQL
 - All use the same connection string
 - MSN SQL Server is the default connection
 - The report is made from a report in MSN
 - The report is made from MSN SQL
- To use the report in the report server



The screenshot shows a report viewer with a data table on the left and a legend on the right. The legend lists several categories with corresponding colors: 'Category 1' (blue), 'Category 2' (orange), 'Category 3' (green), 'Category 4' (red), and 'Category 5' (purple). The data table below has columns for 'Category', 'Value', and 'Date'.

Category	Value	Date
Category 1	100	2008-01-01
Category 2	200	2008-01-02
Category 3	300	2008-01-03
Category 4	400	2008-01-04
Category 5	500	2008-01-05

Modernizing Database Definitions - Transparency

Traditional database definitions are often opaque and difficult to understand.

- Many database definitions are written in a complex, technical language.
- They often lack context and are difficult to read.
- They are often written in a way that is not user-friendly.

Modernizing database definitions involves making them more transparent and easier to understand.

- This can be achieved by using plain language and providing context.
- It also involves making the definitions more user-friendly and easier to read.
- This can be done by using a consistent format and providing clear examples.

Modernizing database definitions is a key step in making databases more accessible and easier to use.



Modernizing Database Definitions - Transparency

Modernizing database definitions involves making them more transparent and easier to understand.

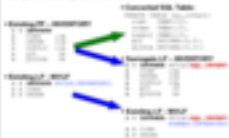
- This can be achieved by using plain language and providing context.
- It also involves making the definitions more user-friendly and easier to read.
- This can be done by using a consistent format and providing clear examples.



Implementing Database Solutions - Transparency

1. Create IP in RDB. Table with metadata
2. Create RDB indexes to replace any explicitly created metadata paths that need for RDB file use (Share indexes)
 - Why?/how
3. Create Storage I/P with administrative input IP name
4. Multi-copying RDB indexes RDB table

Transparent I/O Migration - Example



SQL object management

Modifying Database Definitions in Oracle SQL - Object Management

SQL Object Management Introduction

- > In Oracle SQL, SQL objects are the objects in a database that are used to store and retrieve data. They are created and managed using SQL statements.
- > SQL object management includes creating, altering, and dropping objects.
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Modulierung: Grundriss-Definitionen in Regeln
Teil 1: Kreis-Regelungen

1103 - Kreise & Halbkreise haben unendlichen Umfang. 1104: Der Kreis (KR) ist ein geschlossenes und kreisförmig um einen zentralen Punkt (KRZ) angeordnetes Kreisbogen (KRBO) mit einem zentralen Winkel (KRZW).

- Kreisbogen (KRBO) ist ein Teil des Kreises (KR)
 - Kreisbogen (KRBO) ist ein Teil des Kreises (KR)
 - Kreisbogen (KRBO) ist ein Teil des Kreises (KR)

1105 - Kreisbogen (KRBO) ist ein Teil des Kreises (KR) mit einem zentralen Winkel (KRZW) und einem zentralen Punkt (KRZ).

1106 - Kreisbogen (KRBO) ist ein Teil des Kreises (KR) mit einem zentralen Winkel (KRZW) und einem zentralen Punkt (KRZ).

- Kreisbogen (KRBO) ist ein Teil des Kreises (KR)
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Modulierung: Grundriss-Definitionen in Regeln
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1108 - Kreisbogen (KRBO) ist ein Teil des Kreises (KR) mit einem zentralen Winkel (KRZW) und einem zentralen Punkt (KRZ).

- Kreisbogen (KRBO) ist ein Teil des Kreises (KR)
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1109 - Kreisbogen (KRBO) ist ein Teil des Kreises (KR) mit einem zentralen Winkel (KRZW) und einem zentralen Punkt (KRZ).

Understanding Trigonometric Definitions in Degrees

Math 101

→ Special Angles/Names for common triangles

- Special triangles: 30-60-90 and 45-45-90

30-60-90: $1 : \sqrt{3} : 2$

45-45-90: $1 : 1 : \sqrt{2}$

- Special angles: $30^\circ, 45^\circ, 60^\circ, 90^\circ$

30-60-90: $30^\circ, 60^\circ, 90^\circ$

→ Trigonometric Functions in Degrees: Table definitions, not also additional for other angles

30-60-90: $\sin(30^\circ) = \frac{1}{2}, \cos(30^\circ) = \frac{\sqrt{3}}{2}$

Understanding Trigonometric Definitions in Degrees

→ Unit Circle/Trigonometric Functions

- Unit circle: circle with radius 1 centered at the origin

Equation: $x^2 + y^2 = 1$

- Unit circle is always counter-clockwise

• Angles: $0^\circ, 30^\circ, 45^\circ, 60^\circ, 90^\circ, 120^\circ, 135^\circ, 150^\circ, 180^\circ, 225^\circ, 270^\circ, 300^\circ, 315^\circ, 360^\circ$

• Trigonometric functions: $\sin, \cos, \tan, \cot, \sec, \csc$

→ Signs

- Signs: $\sin, \cos, \tan, \cot, \sec, \csc$ are positive or negative

→ Signs

• Signs: $\sin, \cos, \tan, \cot, \sec, \csc$

→ Signs: $\sin, \cos, \tan, \cot, \sec, \csc$

- Signs: $\sin, \cos, \tan, \cot, \sec, \csc$

Managing Customers & Orders

Managing Customers and Orders

Customer Order History

- Shows list of all orders placed by customer
- For each order, the status, quantity, and total price are shown
- Click on order status to view details of the order

ORDER ID: 1001
 ORDER DATE: 2023-10-26
 ORDER STATUS: **PLACED**

ORDER TOTAL: \$100.00

Customer Order

- Shows details of the order placed by customer
- Includes order status, quantity, and total price
- Shows order history and order details
- Shows order status and order details

Managing Customers & Orders

Managing Customers and Orders

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 ORDER STATUS: **PLACED**
 ORDER TOTAL: \$100.00
 ORDER HISTORY: **PLACED**
 ORDER DETAILS: **PLACED**

Constraints

- Database constraints define business rules
- DBMS provides methods to enforce the rules
 - declarative constraints
 - procedural constraints
- Constraints can assist the query optimizer and DB engine
 - help optimizer to find better execution plan
 - help optimizer to estimate cost
- Examples of declarative programming to enforce coding
 - CHECK constraints
 - FOREIGN KEY constraints
 - PRIMARY KEY constraints
 - UNIQUE constraints
 - TRIGGER constraints

Modeling constraints & triggers

- Triggers allow you enforce business rules in database whenever the data within a table changes
 - DBMS responsible for enforcing the trigger program
 - Execution is independent of the user operation
 - Can be used to maintain the database integrity
- DBMS Trigger Types
 - BEFORE trigger - trigger event is fired before user's DML trigger
 - AFTER trigger - trigger event is fired after user's DML trigger
 - can be used to maintain the database integrity
 - can be used to enforce business rules

Modernizing Java Access

Programming Interface

Native ID in SQL Companion

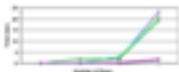
Modernizing Java Access - Programming Interface

Native ID	Source ID	ExtendedSource ID
ExtendedID	ExtendedSource	ExtendedID
SQL Properties Extended Types	SQL Properties Extended Types SQL ID, I	Native SQL name SQL Access (SQL ID) ID ID
	SQL ID, I	SQL ID
	SQL ID, I	
	SQL ID, I	
	SQL ID, I	

SQL ID, I: ExtendedID and ExtendedSource ID of ID (SQL ID)
 SQL ID, I: I

Identifying Data Series

Identify the data series below.



For this question, the data series are:

Blue Line	Red Line	Green Line	Yellow Line	Purple Line
Blue Line	Red Line	Green Line	Yellow Line	Purple Line
Blue Line	Red Line	Green Line	Yellow Line	Purple Line
Blue Line	Red Line	Green Line	Yellow Line	Purple Line
Blue Line	Red Line	Green Line	Yellow Line	Purple Line

Identifying Data Series

Identify the data series below.

- The graph below shows the revenue of a company over time.
 - The graph shows the revenue of a company over time.
 - The graph shows the revenue of a company over time.
 - The graph shows the revenue of a company over time.
 - The graph shows the revenue of a company over time.



Understanding Data Sources

What is a Data Source?

- **SQL** (Structured Query Language) is a standard language for interacting with relational databases. It is used to query, insert, update, and delete data.
- **APIs** (Application Programming Interfaces) provide a way for different software applications to communicate with each other. They allow data to be exchanged between systems.
- **Cloud Data Warehouses** (e.g., Amazon Redshift, Google BigQuery) are managed services that store and process large amounts of data in the cloud.
- **Streaming Data Sources** (e.g., Apache Kafka, Amazon Kinesis) provide real-time data feeds for applications that require low-latency processing.
- **External Data Sources** (e.g., SaaS applications, IoT devices) provide data from outside the organization's internal systems.

What is a Data Source?

- **Identify Data Source**
 - Determine the data source and its location.
- **Access the Data Source**
 - Use the appropriate API or connector to access the data.
- **Process the Data**
 - Transform the data into a format suitable for analysis.

2. Die Organisation

- **2.1. Aufgaben-Management-Strategie**
 - **2.1.1. Aufgaben-Management-Strategie**
- **2.1.2. Aufgaben-Management-Strategie**
- **2.1.3. Aufgaben-Management-Strategie**
- **2.1.4. Aufgaben-Management-Strategie**
- **2.1.5. Aufgaben-Management-Strategie**
- **2.1.6. Aufgaben-Management-Strategie**
- **2.1.7. Aufgaben-Management-Strategie**
- **2.1.8. Aufgaben-Management-Strategie**
- **2.1.9. Aufgaben-Management-Strategie**
- **2.1.10. Aufgaben-Management-Strategie**

2.2.2.2. Aufgaben-Management-Strategie

- **2.2.2.2.1. Aufgaben-Management-Strategie**
- **2.2.2.2.2. Aufgaben-Management-Strategie**
- **2.2.2.2.3. Aufgaben-Management-Strategie**
- **2.2.2.2.4. Aufgaben-Management-Strategie**
- **2.2.2.2.5. Aufgaben-Management-Strategie**
- **2.2.2.2.6. Aufgaben-Management-Strategie**
- **2.2.2.2.7. Aufgaben-Management-Strategie**
- **2.2.2.2.8. Aufgaben-Management-Strategie**
- **2.2.2.2.9. Aufgaben-Management-Strategie**
- **2.2.2.2.10. Aufgaben-Management-Strategie**

Microsoft SQL Server Enterprise Edition

SQL Server Enterprise Edition



The screenshot displays the SQL Server Enterprise Edition interface. On the left, a tree view shows the server instance with a list of databases. The 'Adventureworks2008' database is selected, and its details are shown in the main pane. The details pane includes sections for 'Database Properties', 'Database Files', and 'Database Collation'. The 'Database Properties' section shows the database name as 'Adventureworks2008', the owner as 'sa', and the collation as 'Latin1_General_CI_AS_KS_WS'. The 'Database Files' section shows the primary data file 'Adventureworks2008.ndb' and the log file 'Adventureworks2008.ldf'. The 'Database Collation' section shows the collation as 'Latin1_General_CI_AS_KS_WS'.

Database Properties

- Database Name: Adventureworks2008
- Owner: sa
- Collation: Latin1_General_CI_AS_KS_WS

Database Files

- File Name: Adventureworks2008.ndb
- File Size: 1024000000
- File Path: C:\Program Files\Microsoft SQL Server\MSSQL\DATA\Adventureworks2008.ndb

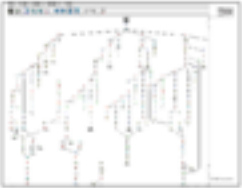
Database Collation

- Collation: Latin1_General_CI_AS_KS_WS

Microsoft SQL Server Enterprise Edition

SQL Server Enterprise Edition

WHY SQL?



CK12 Student Support Center

CK12 for Educator Workshop

<http://www.ck12.org/educator-support-center/educator-workshop>



Need help?

CK12 for Educator Support

- Student materials
- CK12 Wiki
- Student Support - Admin and Training
- CK12 CK12 content creation and review
- CK12 content review and feedback
- CK12 for Educator training

Contact: help@ck12.org | www.ck12.org/educator-support-center
 Phone: 800-451-2022