



موسسه
پژوهش و آموزش
همکاران سیستم

دوره طراحی و SQL Server DBA

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github.com/hamidfaghedi/SQLClass

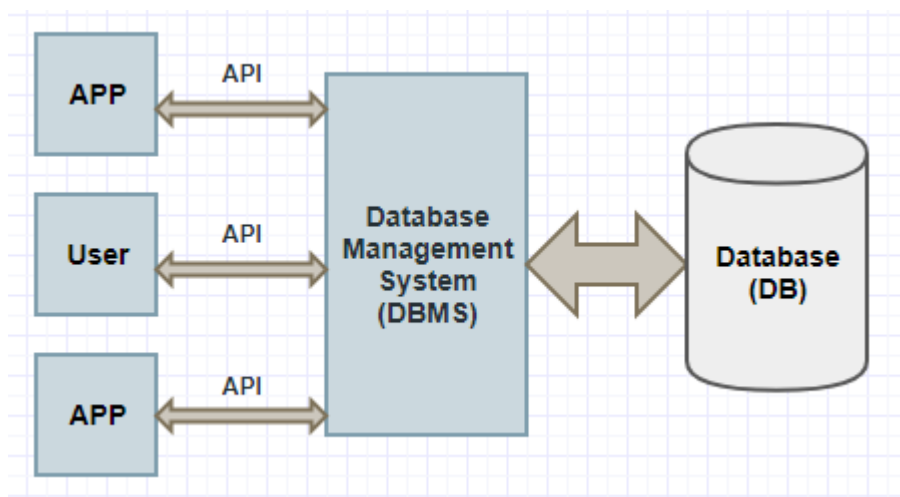


جلسه اول

مفاهیم مقدماتی

- مفهوم پایگاه داده
- تاریخچه پایگاه داده
- پایگاه داده رابطه‌ای (RDBMS)
- SQL
- ACID
- Instance
- Collation
- سرویس‌های SQL Server
- نصب

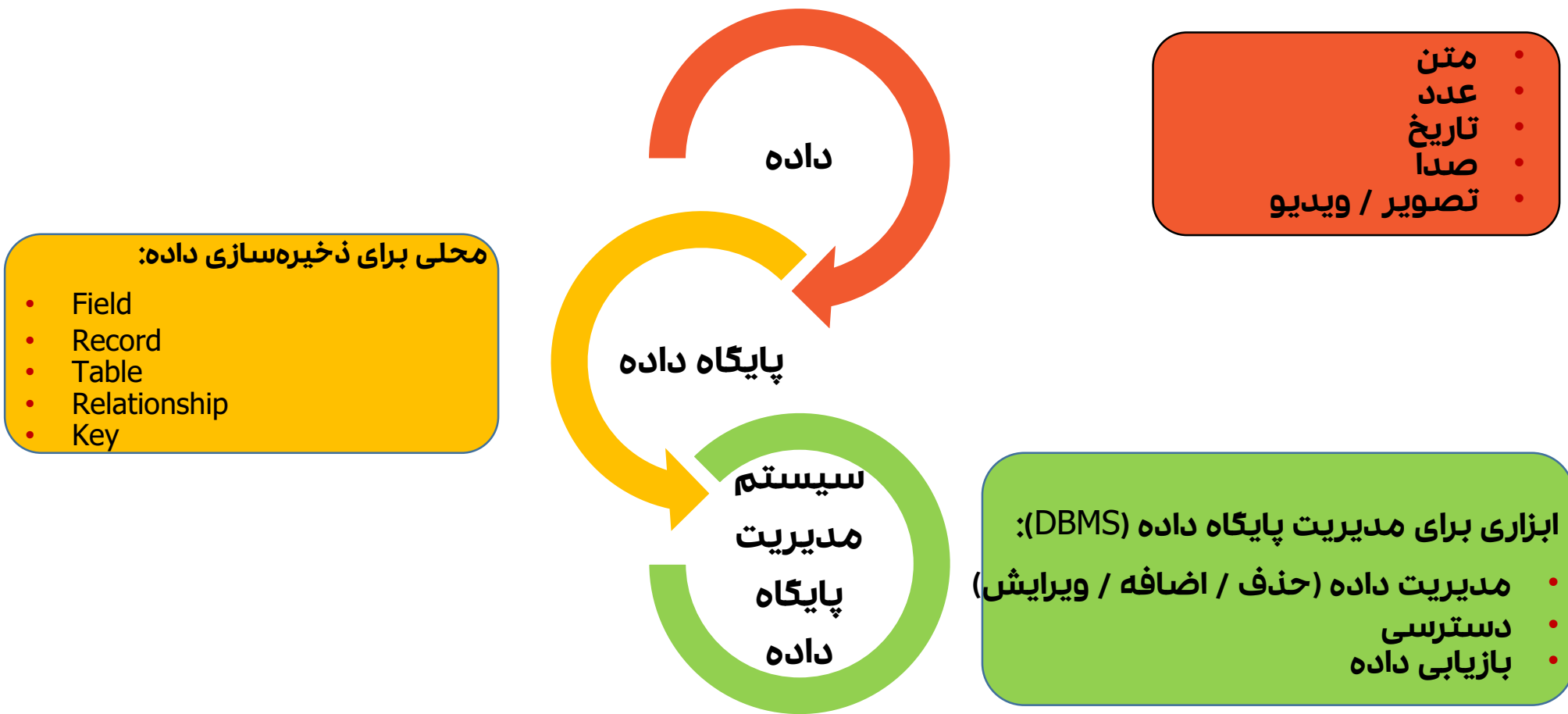
پایگاه داده چیست؟



- ذخیره‌سازی سازمان‌یافته اطلاعات
- به هم مرتبط
- غیرتکراری
- مبتنی بر یک مدل داده‌ای (Data Model)
- تحت کنترل یک سیستم متمرکز
- قابل استفاده به صورت اشتراکی و همزمان توسط چند کاربر

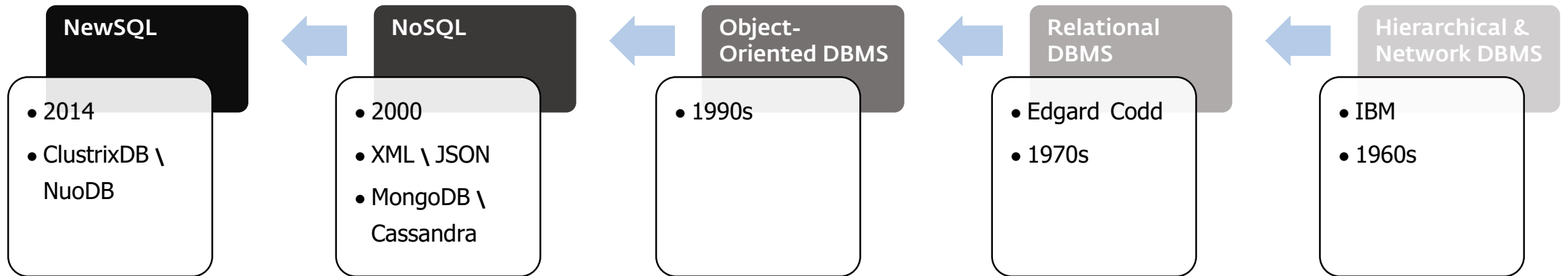


مفهوم پایگاه داده





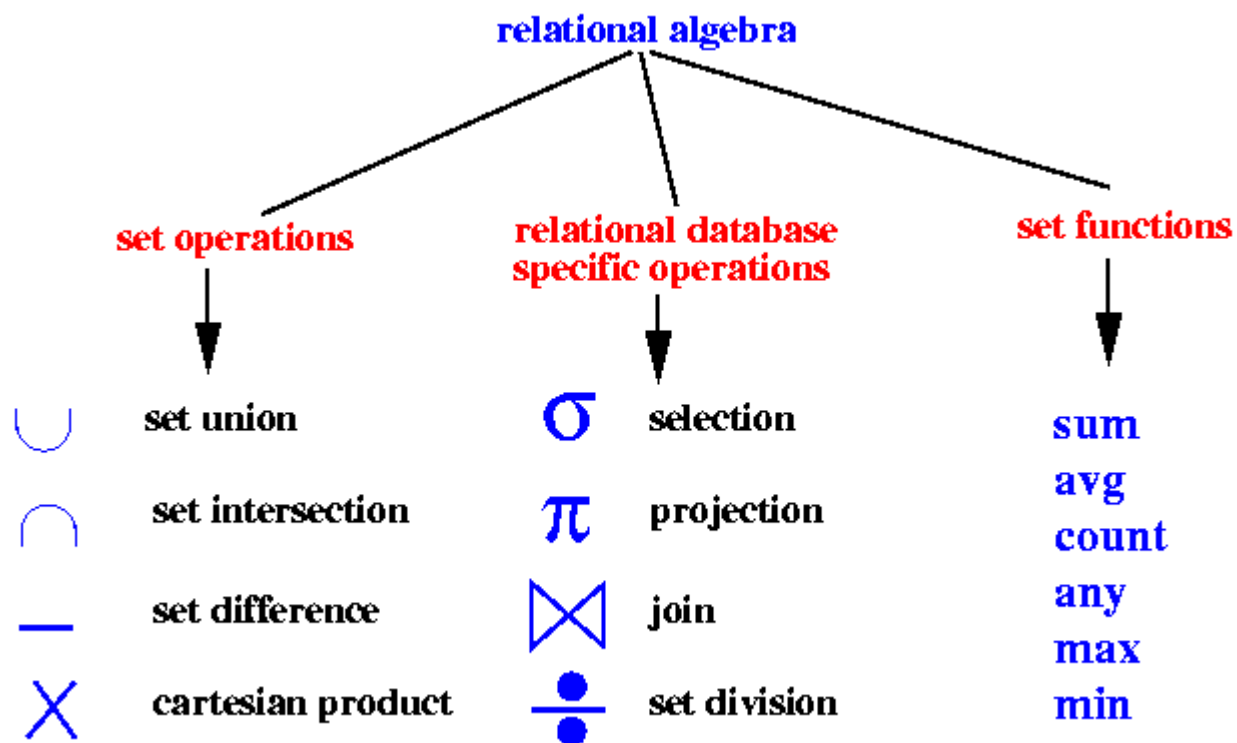
تاریخچه سیستم‌های مدیریت پایگاه داده (DBMS)





■ تئوری مجموعه‌ها (Set theory)

■ جبر رابطه‌ای (Relational Algebra)





پایگاه داده رابطه‌ای

نمونه‌های پایگاه داده رابطه‌ای

Enterprise



☐ Microsoft SQL Server

☐ Microsoft Access

☐ Oracle

Open Source



☐ MySQL

☐ PostgreSQL

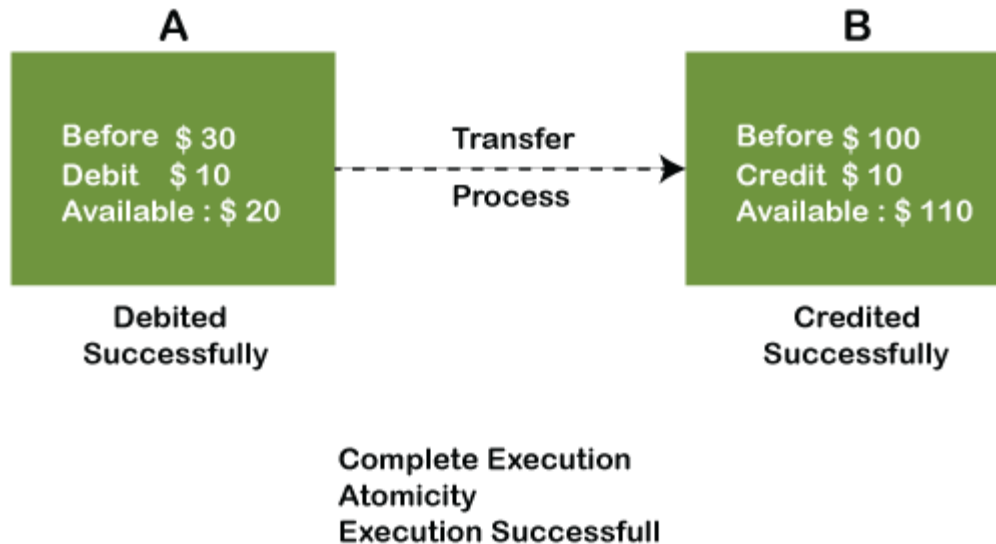
☐ SQLite



ACID

- **Atomicity**

- It means if any operation is performed on the data, either it should be performed or executed completely or should not be executed at all.

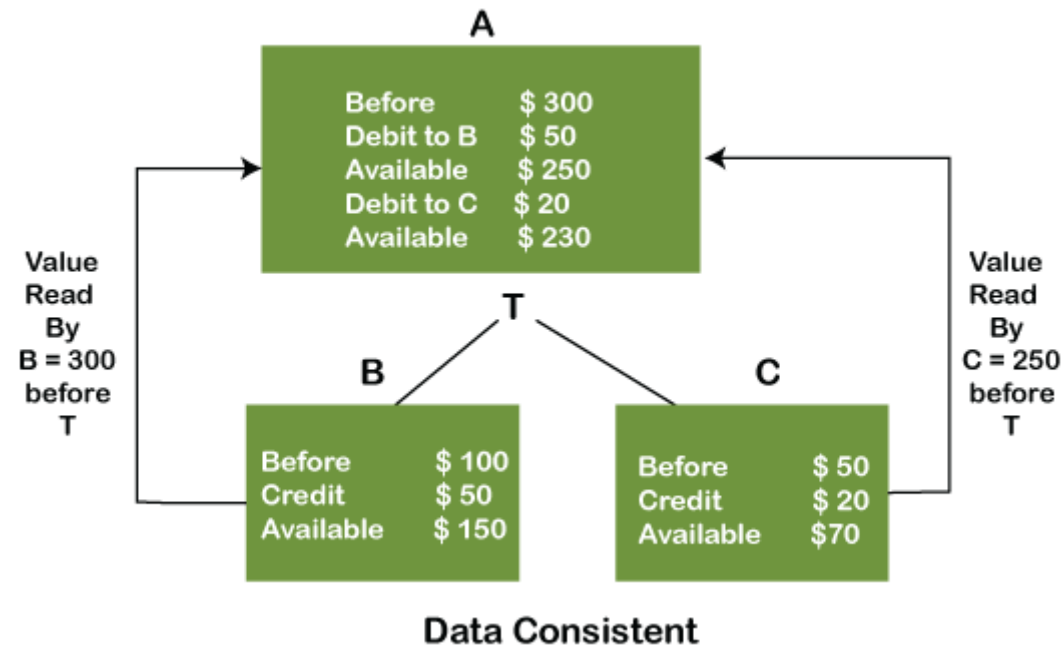




ACID

- Consistency

- Data is in a consistent state when a transaction starts and when it ends.

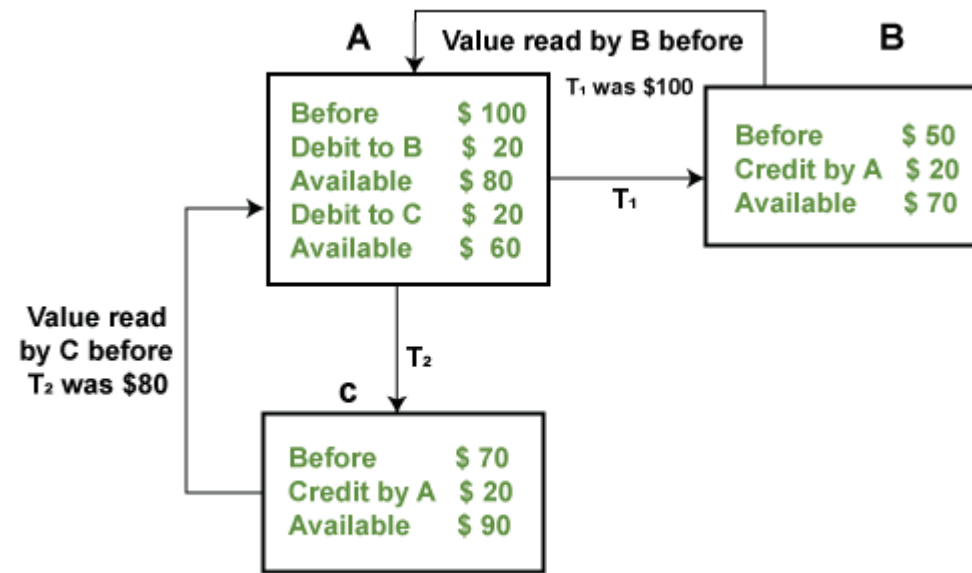




ACID

■ Isolation

- Any changes that occur in any particular transaction will not be seen by other transactions until the change is not committed in the memory



Isolation - Independent execution of T₁ & T₂ by A



ACID

- **Durability**
 - ensures that the data after the successful execution of the operation becomes permanent in the database



Structured Query Language (SQL)

- For Querying RDBMS
- IBM by Donald D Charmberch, Reymond G Boyce
- Declarative
- Structured English Query Language (SEQUEL)
 - “Bring me a soda from the refrigerator.”
the object comes before the location
- 1986 - ANSI & ISO —→ 2016
- DDL / DQL / DML / DCL



Structured Query Language (SQL)

RDBMS

Language



☐ Microsoft SQL Server

☐ Transact-SQL (T-SQL)

☐ Oracle

☐ PL/SQL

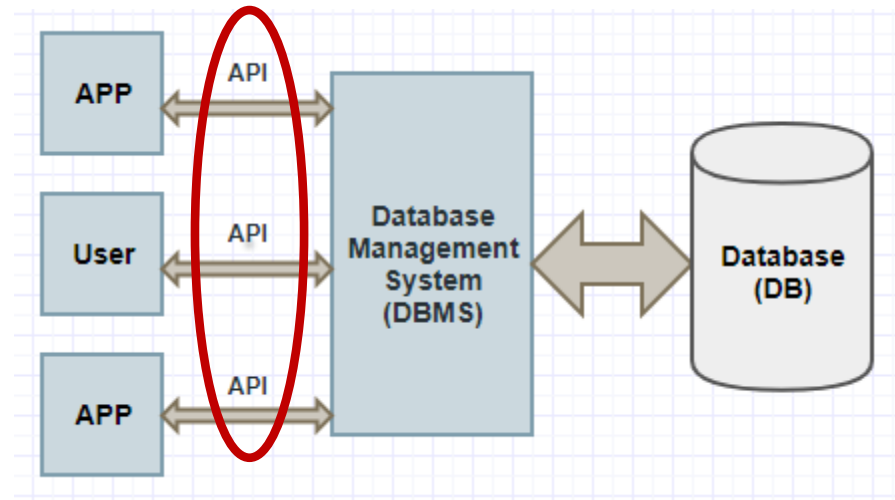
☐ MySQL

☐ SQL/PSM



IDE

SQL Server Management Studio (SSMS)





نسخه و ورژن‌های SQL Server

- Enterprise
- Standard
- Web
- Express
- Developer



Instance



Collation

- به معنی تطبیق دست خط

- تعیین الگوی مرتب سازی اطلاعات کاراکتری در داخل جداول و ایندکس ها

- ویژگی

SQL_Latin_1256_CI_AS

Persian_100_CI_AI

- Case Sensitive

- Accent Sensitive

- Kana Sensitive

- Width Sensitive

- به ازای

- Instance

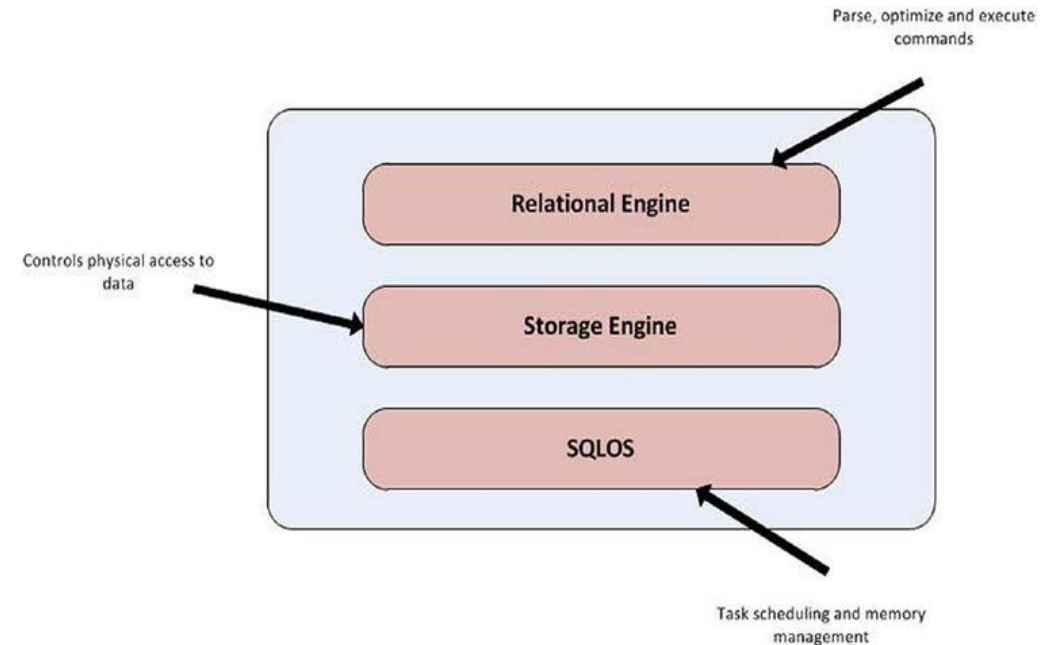
- Data Base

- Field



سرویس‌ها و امکانات Microsoft SQL Server

- **Database Engine:** is the core service
 - **SQLOS**
 - **Storage Engine**
 - **Relational Engine**





سرویس‌ها و امکانات Microsoft SQL Server

- Machine learning services
 - R
 - Python



سرویس‌ها و امکانات Microsoft SQL Server

- **PolyBase Query Service:**

Query data with T-SQL directly from SQL Server, Oracle, Teradata, MongoDB, Hadoop clusters, Cosmos DB without separately installing client connection software.



سرویس‌ها و امکانات Microsoft SQL Server

- **Analysis Services:**
 - Multidimensional and data mining
 - Tabular
 - PowerPivot for SharePoint



سرویس‌ها و امکانات Microsoft SQL Server

- **Data Quality Client:**

Allows you to administer DQS as well as perform data-matching and data-cleansing activities.

DQS and MDS along with the rest of the SQL Server platform enable organizations to capture, integrate and distribute data that is credible, reliable, and accurate to support daily operations and to derive meaningful insights.



سرویس‌ها و امکانات Microsoft SQL Server

- **Client Connectivity Tools:**

Client Connectivity Tools is a set of components for client/server communication. This includes the OLEDB, ODBC, ADODB, and OLAP network libraries.



سرویس‌ها و امکانات Microsoft SQL Server

- **Integration Service:**

From 2012

Used For ETL

Scale out:

Scale out master: The Scale Out Master is responsible for Scale Out management and receives package execution requests from users.

Scale out workers: The Scale Out Workers pull execution tasks from the Scale Out Master and run the packages



سرویس‌ها و امکانات Microsoft SQL Server

- Client Tools Backward Compatibility:



سرویس‌ها و امکانات Microsoft SQL Server

- Client Tools SDK

Installing the Client Tools SDK provides the SMO (Server Management Objects) assemblies. This allows you to programmatically control SQL Server and Integration Services from within .NET applications.

*SDK (software development kit)



- **Distributed Replay Controller:**
 - Distributed Replay has a lower impact on resources than Profiler, meaning that the servers you are tracing run less risk of suffering performance issues while the trace is running.
 - Distributed Replay allows you to capture workloads from multiple servers (clients) and replay them on a single host.
 - Within a Distributed Replay topology, you need to configure one server as the controller. It is the controller that will orchestrate the work against the client(s) and the target server.



سرویس‌ها و امکانات Microsoft SQL Server

- **Master Data Services:**

Is a Microsoft product for developing MDM solutions that is built on top of SQL Server database technology for back end processing

MDM: So many of the problems that organizations have with their IT applications are due to the struggle with data, in the absence of overall organization-wide control and supervision of data and its progress through the various parts of the organization. Master data management (MDM) offers a solution to the many data woes by controlling data change, It does it in an analogous way to Version Control, so that changes are cleansed, checked, tracked and audited, and any named version can be published to other services . Now Microsoft has an implementation as part of the data platform

Master Data Services enables you to manage a master set of your organization's data. You can organize the data into models, create rules for updating the data, and control who updates the data. With Excel, you can share the master data set with other people in your organization.



سرویس‌ها و امکانات Microsoft SQL Server

- Reporting Service



نصب