MODULE 5

Implementing Business Intelligence

Business Intelligence Platform

A business intelligence platform is a software solution that enables organizations to gather, analyze, and visualize their business data to gain valuable insights. It provides a centralized repository for storing data from various sources and offers tools for data analytics, reporting, and data visualization. With a business intelligence platform, businesses can make data-driven decisions, monitor key performance indicators, and identify trends and patterns to optimize their operations and drive growth.

Business Intelligence Platform Capability Matrix

A capability matrix for a business intelligence platform provides an overview of the features and functionalities it offers.

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Components of BI Capability Matrix

Data Integration

Data extraction from various sources
Data transformation and cleansing
Data loading into a centralized repository

Data Modeling

Data Analysis and Reporting

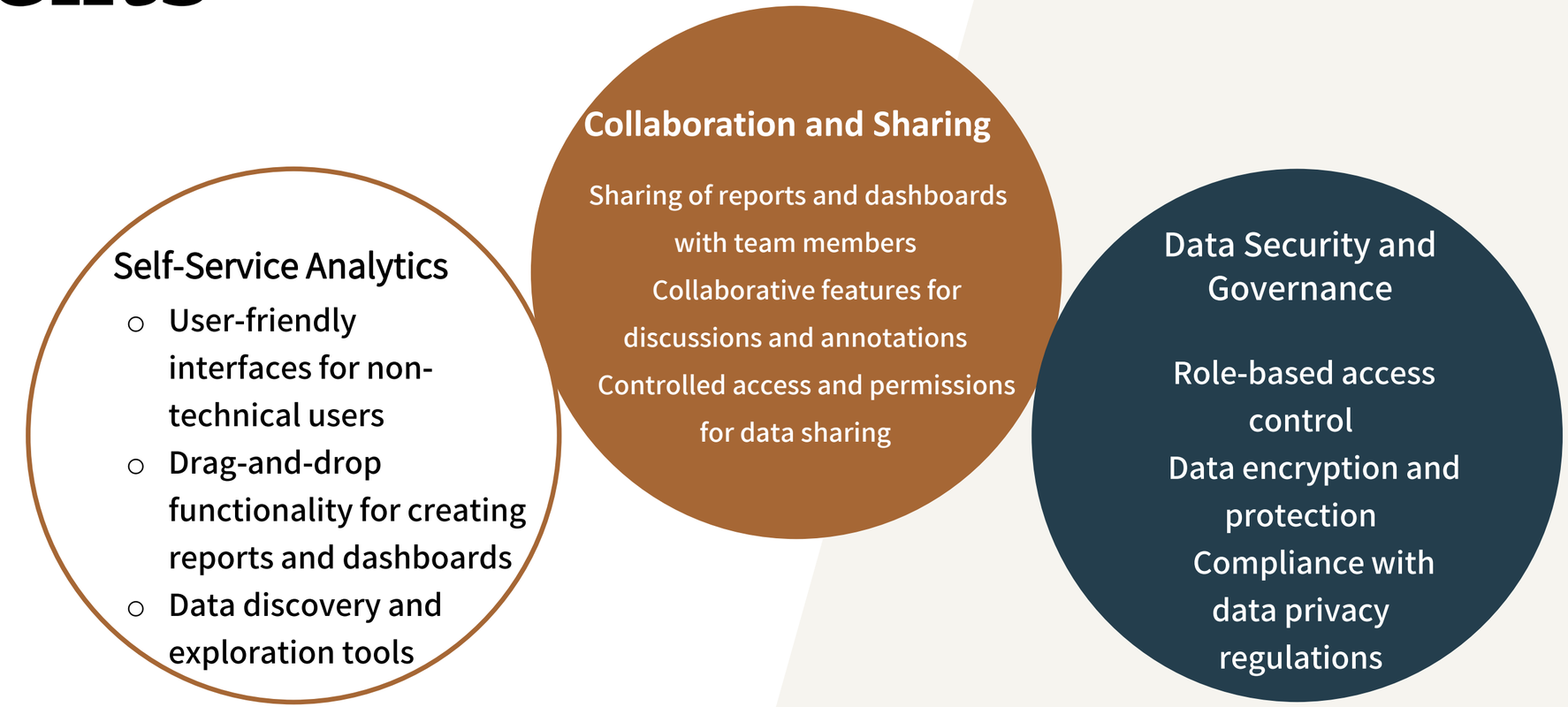
Creation of data models for efficient data storage and retrieval
Design and implementation of data structures for analysis and reporting

Ad-hoc querying and data exploration
Interactive dashboards and visualizations
Advanced analytics and statistical modeling
Scheduled and automated report generation

Data Visualization

Rich visualizations, such as charts, graphs, and maps
Interactive and customizable dashboards
Drill-down and filtering capabilities for deeper insights

Components


Self-Service Analytics
User-friendly interfaces for non-technical users
Drag-and-drop functionality for creating reports and dashboards
Data discovery and exploration tools
Collaboration and Sharing
Sharing of reports and dashboards with team members
Collaborative features for discussions and annotations
Controlled access and permissions for data sharing
Data Security and Governance
Role-based access control
Data encryption and protection
Compliance with data privacy regulations

Components of BI Capability Matrix

Scalability and Performance

- Ability to handle large volumes of data
- Efficient data processing and query optimization
- High availability and reliability

Integration and Connectivity

Mobile and On-the-Go Access

Integration with various data sources and systems
API support for data integration with external applications
Connectivity to cloud-based services and databases

Mobile-friendly interfaces and responsive design
Access to reports and dashboards on mobile devices
Offline capabilities for data access in remote locations

BI Target Databases

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Types of BI Target Databases

Relational Databases:

Traditional relational databases like Oracle, Microsoft SQL Server, MySQL, and PostgreSQL are widely used for BI.

They provide structured data storage and offer robust querying capabilities.

Relational databases are suitable for handling large volumes of data and complex data relationships.

Data Warehouses:

Data warehouses are specifically designed for BI and analytics.

They integrate data from various sources and provide a consolidated view for reporting and analysis.

Popular data warehouse platforms include Snowflake, Amazon Redshift, and Google BigQuery.

Online Analytical Processing (OLAP) Databases:

OLAP databases are optimized for multidimensional analysis.

They store pre-aggregated data to enable fast querying and slicing and dicing of data.

Examples of OLAP databases include Microsoft Analysis Services, Oracle OLAP, and IBM Cognos TM1.

Columnar Databases

Columnar databases store data in a column-wise format, enabling efficient compression and fast query performance.

They are suitable for analytical workloads and data-intensive BI applications.

Popular columnar databases used in BI include Amazon Redshift, Google BigQuery, and Apache Cassandra.

Types of BI Target Databases

NoSQL Databases

NoSQL databases, such as MongoDB, Cassandra, and HBase, are non-relational databases that offer flexible data models.

They can handle unstructured and semi-structured data and support high scalability and performance.

NoSQL databases are often used in BI for handling big data and real-time analytics.

In-Memory Databases:

In-memory databases store data in the computer's main memory for faster data access and processing.

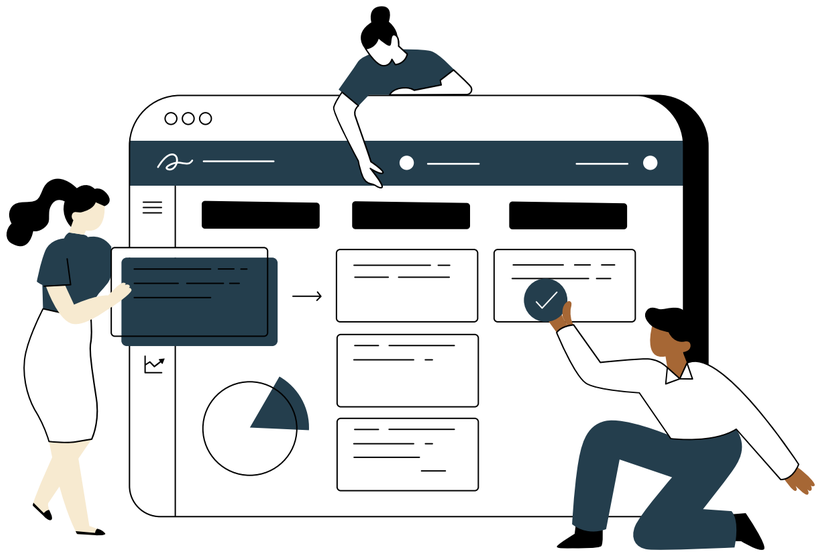
They are suitable for real-time analytics and interactive data exploration.

Examples of in-memory databases used in BI include SAP HANA, Oracle TimesTen, and Apache Ignite.

BI Products and Vendors

BI Products

- BI products encompass a wide range of software tools and platforms designed to collect, analyze, and visualize data for business insights.
- These products offer features such as data integration, data modeling, ad-hoc querying, reporting, data visualization, and advanced analytics.
- BI products can be on-premises software, cloud-based solutions, or hybrid models, providing flexibility in deployment options.



Common Features

- BI products typically include functionalities like data connectors to various data sources, data transformation and cleansing capabilities, and data modeling tools.
- They offer interactive dashboards, reports, and visualizations for data exploration and analysis.
- Advanced analytics features, such as predictive analytics, machine learning, and data mining, may also be available in some BI products.

Vendor Differentiation

A

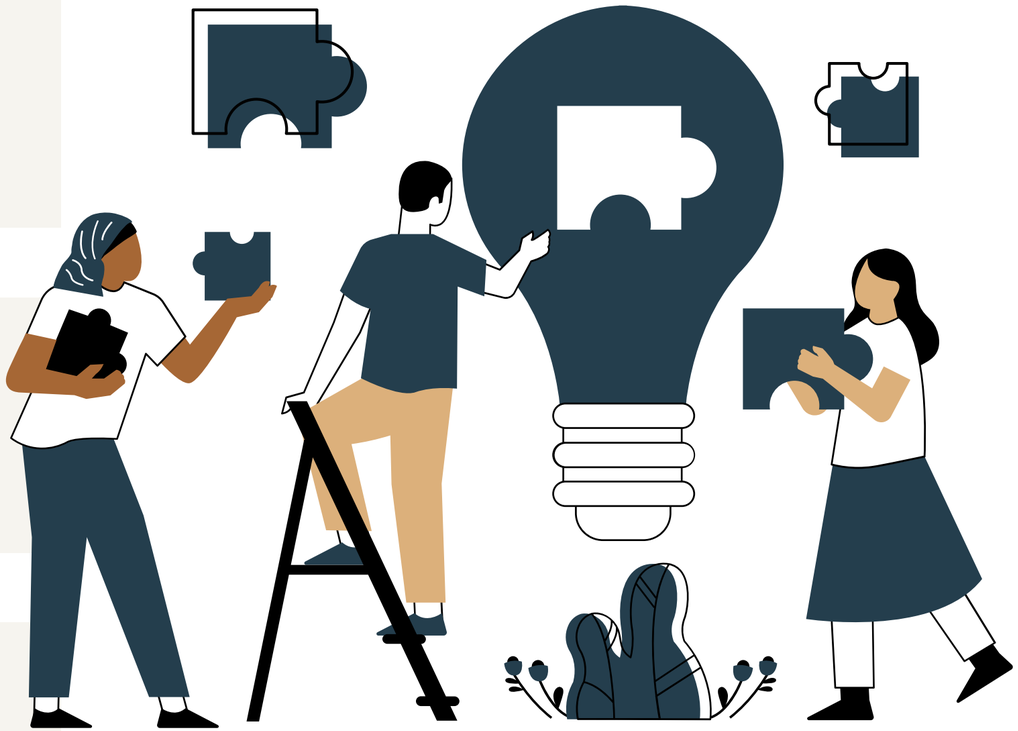
Each BI vendor has its own strengths and focuses on different aspects of BI, such as ease of use, data visualization capabilities, advanced analytics, or integration with specific data sources.

B

Vendors may also offer additional services, such as consulting, training, and customer support, to help organizations effectively implement and utilize their BI products.

C

When selecting a BI product, organizations should consider factors like their specific business requirements, scalability, ease of use, integration capabilities, pricing models, and vendor support.



Popular BI Vendors

- Several well-established vendors dominate the BI market, including: Microsoft Power BI
- Tableau
- QlikView
- IBM Cognos
- SAP BusinessObjects
- MicroStrategy
- Oracle Analytics Cloud
- Salesforce Einstein Analytics
- SAS Business Intelligence

The Big Four Business Intelligence vendors

The Big Four Business Intelligence (BI) vendors refer to the four major players in the BI market that have a significant presence and market share. These vendors are known for their comprehensive BI solutions and widespread adoption across industries

Microsoft Power BI

It provides intuitive data visualization, interactive dashboards, and self-service analytics capabilities.

Power BI integrates well with other Microsoft tools and technologies, such as Excel and Azure.

Power BI is a widely used and highly regarded BI platform offered by Microsoft.

Qlik

- Qlik offers a robust BI platform known for its associative data model and data discovery capabilities.
- It enables users to explore data intuitively, make associations across multiple data sources, and uncover insights.
- Qlik provides self-service analytics, powerful data visualization, and collaboration features.

Tableau

- Tableau is renowned for its user-friendly and powerful data visualization capabilities.
- It allows users to create visually appealing and interactive dashboards and reports.
- Tableau supports advanced analytics and offers a range of data connectivity options.

SAP BusinessObjects

- SAP BusinessObjects is a comprehensive BI suite offered by SAP, a leading enterprise software company.
- It provides a range of tools and applications for reporting, ad-hoc analysis, data visualization, and data exploration.
- SAP BusinessObjects integrates with other SAP products and offers extensive enterprise-level capabilities.

BI Components and Architecture

Data Sources

Various data sources, such as databases, data warehouses, cloud services, and external systems, provide the raw data for business intelligence.

Data Integration

Data integration processes extract, transform, and load (ETL) data from different sources into a unified format suitable for analysis and reporting.

Data Storage

The data storage component includes data warehouses, data marts, or data lakes where the integrated and transformed data is stored for efficient retrieval and analysis.

Data Modeling

Data modeling involves creating logical and physical data models that define the structure and relationships of the data for analysis purposes.

Business Intelligence Tools

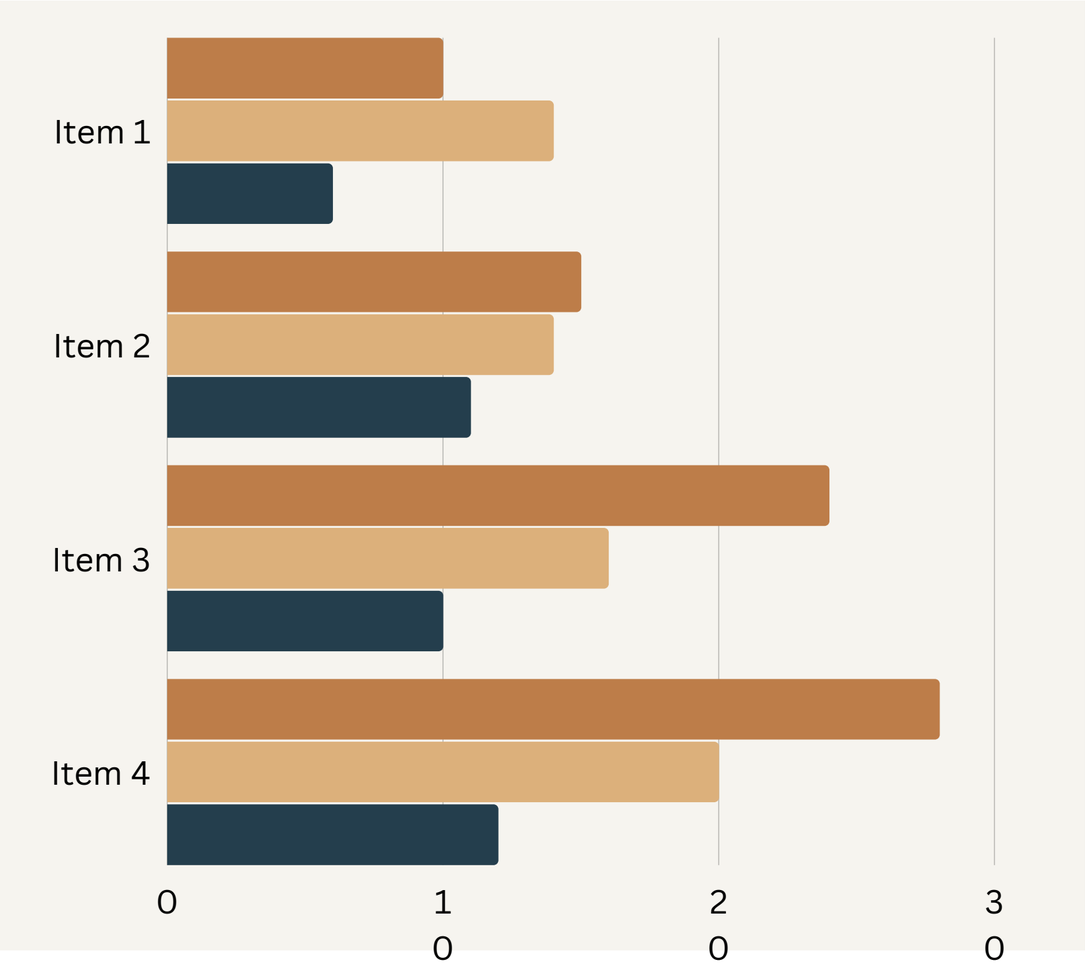
BI tools provide a user interface for interacting with the data, conducting analysis, and creating visualizations, reports, and dashboards.

These tools can include data discovery and exploration tools, reporting tools, data visualization tools, and self-service analytics platforms.

Analytics and Reporting

Analytics capabilities enable users to perform complex calculations, statistical analysis, and predictive modeling on the data.

Reporting features allow the generation of predefined or ad-hoc reports based on the analyzed data.



Data Presentation:

Data presentation components focus on visualizing the analyzed data through interactive dashboards, charts, graphs, and other visual elements.

These components make it easier for users to understand and interpret the insights derived from the data.

Collaboration and Sharing:

Collaboration features enable users to share insights, reports, and dashboards with others, fostering collaboration and knowledge sharing within the organization.

Security and Governance:

Security and governance components ensure that data is protected, access is controlled, and compliance with regulations and policies is maintained.

These components include user authentication, data encryption, data privacy measures, and data governance frameworks.

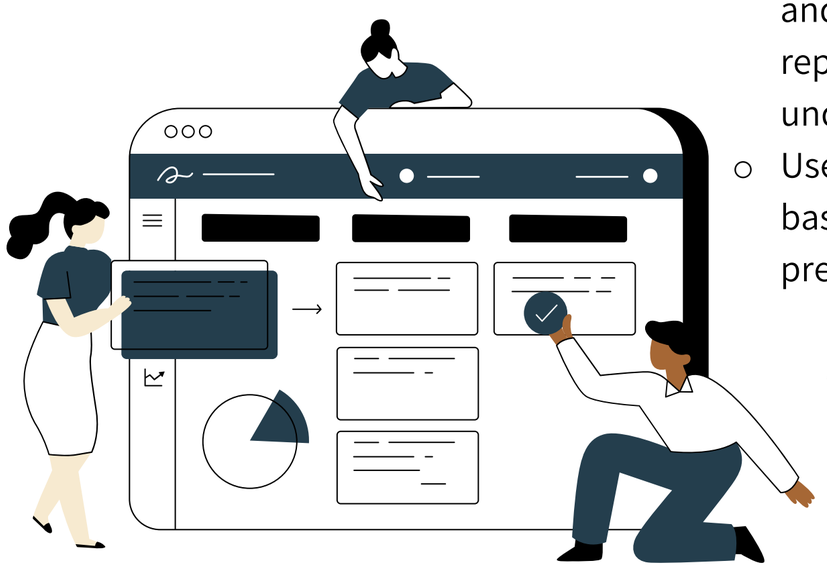
Functional areas of BI Tools

Data Integration

BI tools facilitate data integration by connecting to various data sources, extracting data, transforming it into a unified format, and loading it into a data warehouse or data mart for analysis.

Data Modeling and Design

BI tools provide capabilities for creating logical and physical data models, defining relationships between data elements, and designing the structure of the data for efficient analysis and reporting.



Data Visualization and Reporting

- BI tools enable users to create visually appealing and interactive dashboards, charts, graphs, and reports to present data in a meaningful and understandable way.
- Users can customize the visualizations and reports based on their specific requirements and preferences.

Ad-Hoc Query and Analysis

- BI tools offer ad-hoc query capabilities that allow users to explore data and perform on-the-fly analysis.
- Users can create queries, apply filters, drill down into data, and perform calculations to gain insights and answer specific business questions.

Predictive Analytics and Data Mining

A

Some advanced BI tools provide predictive analytics and data mining functionalities.

B

Users can apply statistical models, machine learning algorithms, and data mining techniques to uncover patterns, trends, and predictive insights from the data.

Performance Management and Scorecards:

BI tools support performance management by providing scorecards, key performance indicators (KPIs), and performance monitoring capabilities.

Users can track performance metrics, set targets, and monitor progress towards organizational goals.

Collaboration and Sharing:

BI tools enable collaboration and sharing of insights by allowing users to share dashboards, reports, and analysis results with others.

Users can collaborate, annotate, and comment on shared content, fostering teamwork and knowledge sharing.

Mobile BI:

Many BI tools offer mobile support, allowing users to access and interact with BI content on mobile devices.

Users can view dashboards, reports, and visualizations on the go, enabling real-time decision-making and analysis.

Data Governance and Security:

BI tools include features for data governance, ensuring data quality, consistency, and security.

Administrators can define access controls, user permissions, and data governance policies to protect sensitive data and comply with regulations.

Data Exploration and Discovery:

Some BI tools provide data exploration and discovery capabilities, allowing users to uncover hidden insights and patterns in data through interactive exploration and data discovery techniques.