

BINF 303

Information and Communication architecture 1

Dr. Ayman Al-Serafi

Winter 2023

Course TAs:

- Aliaa Adel (B1.322) → Tuesday 2nd
Aliaa.adel@guc.edu.eg
- Farida Kamel (B1.322) → Sunday 2nd
Farida.salaheldin@guc.edu.eg
- Ali Midhat (B1.322) → Sunday 2nd
Ali.midhat@guc.edu.eg
- Mariam Ahmed (B1.320) → Monday 2nd
Mariam.adel-elemary@guc.edu.eg
- Hams Dorgham (B5.229) → Sunday 5th
Hams.wael@guc.edu.eg
- Amr Kasber (B5.229) → Monday 2nd
Amr.yasser@guc.edu.eg

Tutorial Outline:

- “Intro to BI” course recap
- Introduction to ICA
- Introduction to modelling
- Course assessment
- Semester plan

Quick Recap 😊

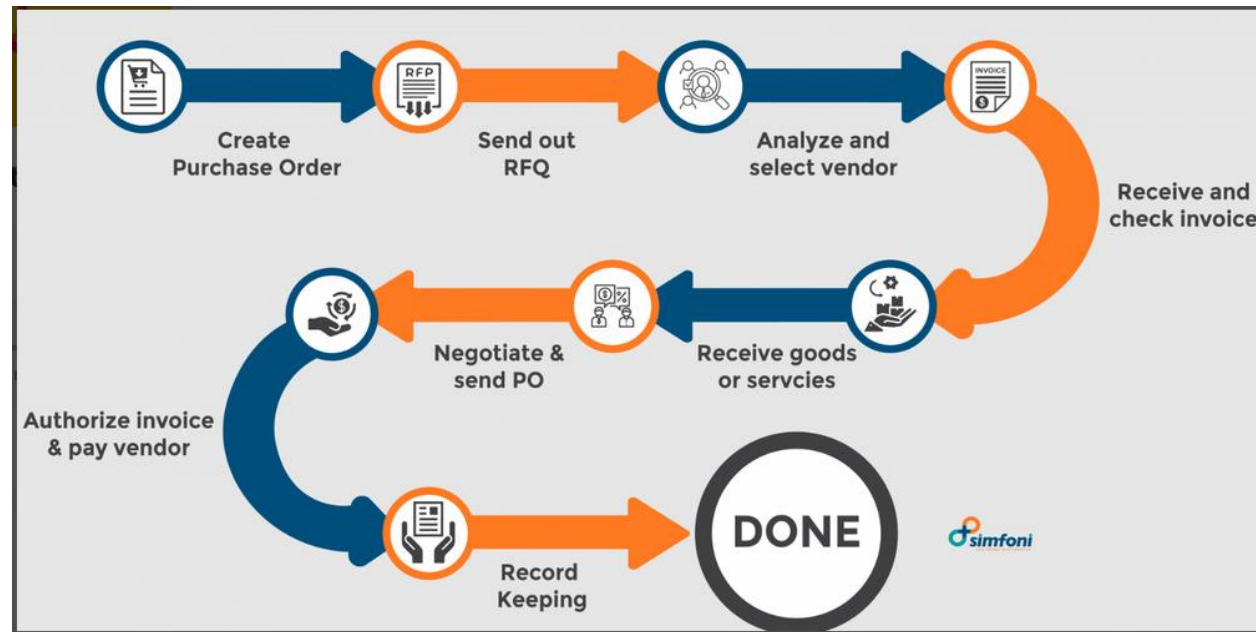
- What is a Business Process ?
- Digitalization and Information Systems
- BPM
- Databases and ERD design
- Enterprise Systems



Business Process

A collection of related tasks in which a specific sequence produces a product or a service.

Ex. Procurement and Fulfillment Process.

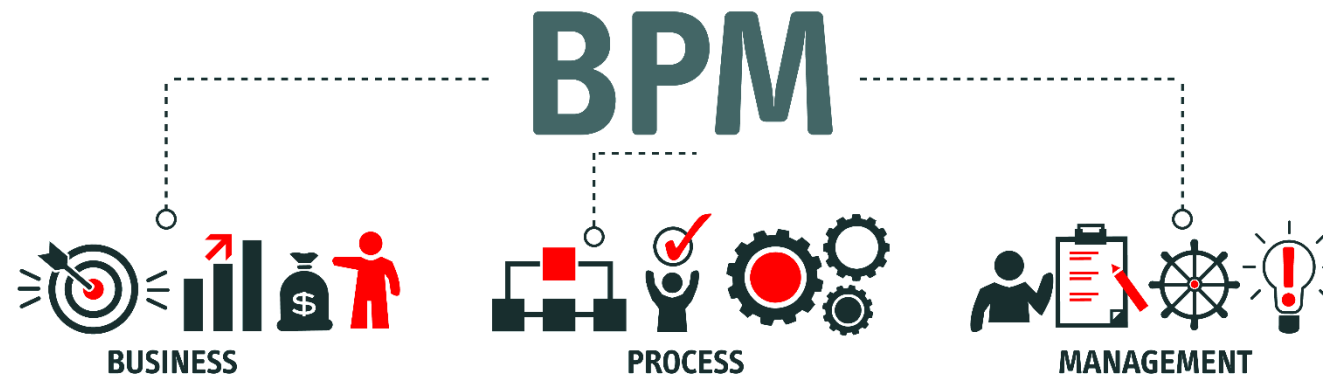


Digitalization and Information Systems

- ❑ Digitalization is converting information into a digital format
- ❑ Information Systems are a set of interrelated components that collect, process and distribute information to support decision making
- ❑ Digital IS are electronic systems that integrate software and hardware to enable communication between departments.

Business Process Management

- ❑ BPM is a discipline in which people use various methods to discover, model, analyze and automate business processes.



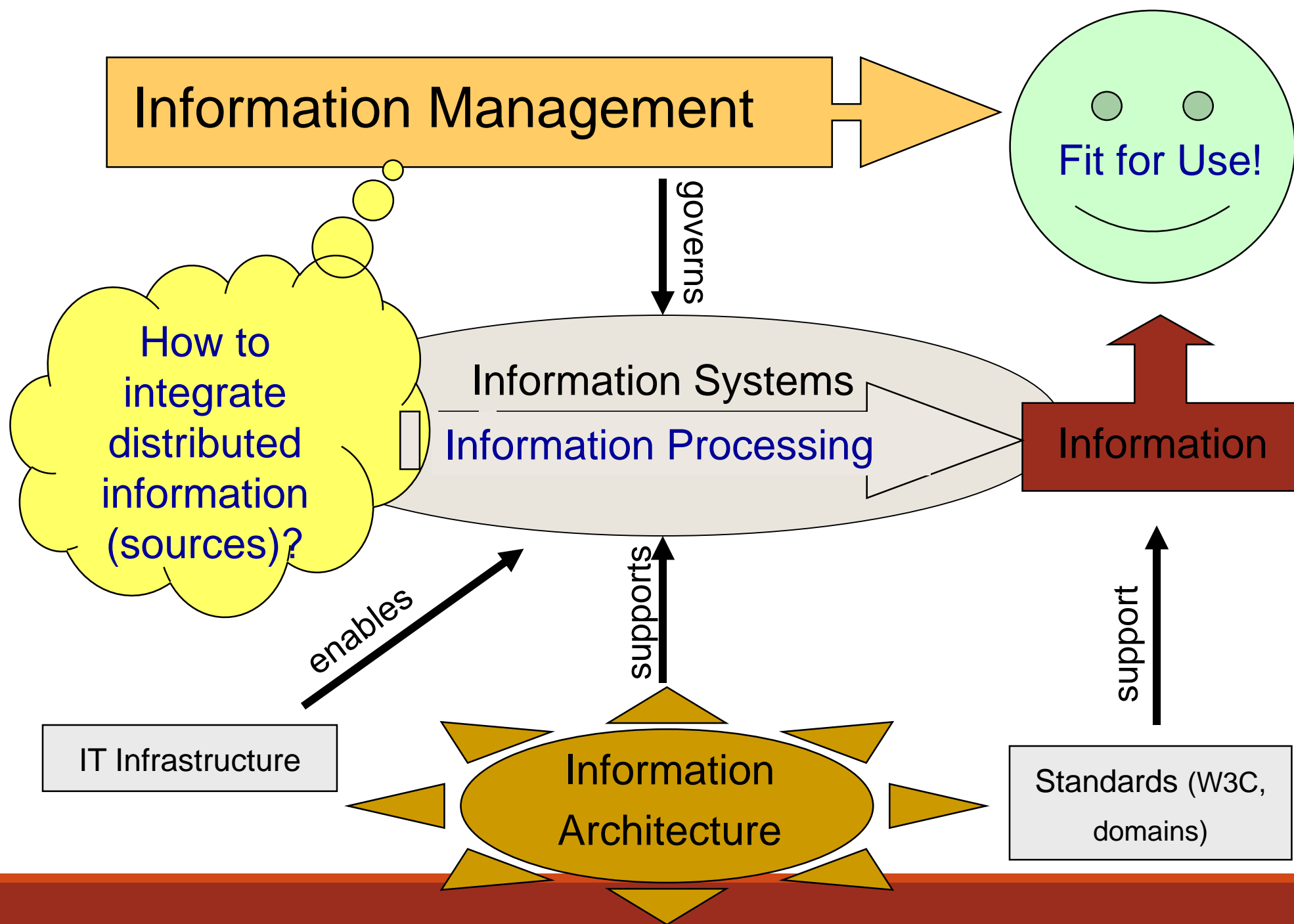
What is ICA?



- An in depth understanding of information and how the flow of information can be structured and supported through technology.
- How to build our information inside the system to have the best use out of it.
- Company information is regarded as assets, so I need a system to store these assets to support decision making process.

Course aim:

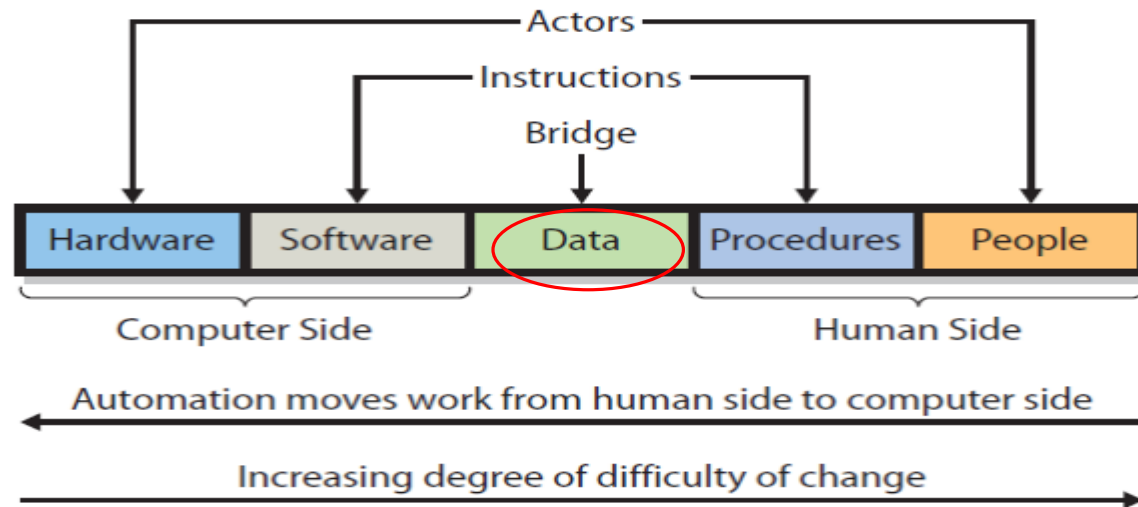
- To be able to develop business specifications and requirements for developers and programmers.
- To be able to understand the flow of information and communication that are structured and supported by the IT systems.
- To be able to manage, design and model different types of information in order to be implemented the DB.
- Discuss the role of IS department in planning and creating information and communication architecture.
- To know the importance of IM.



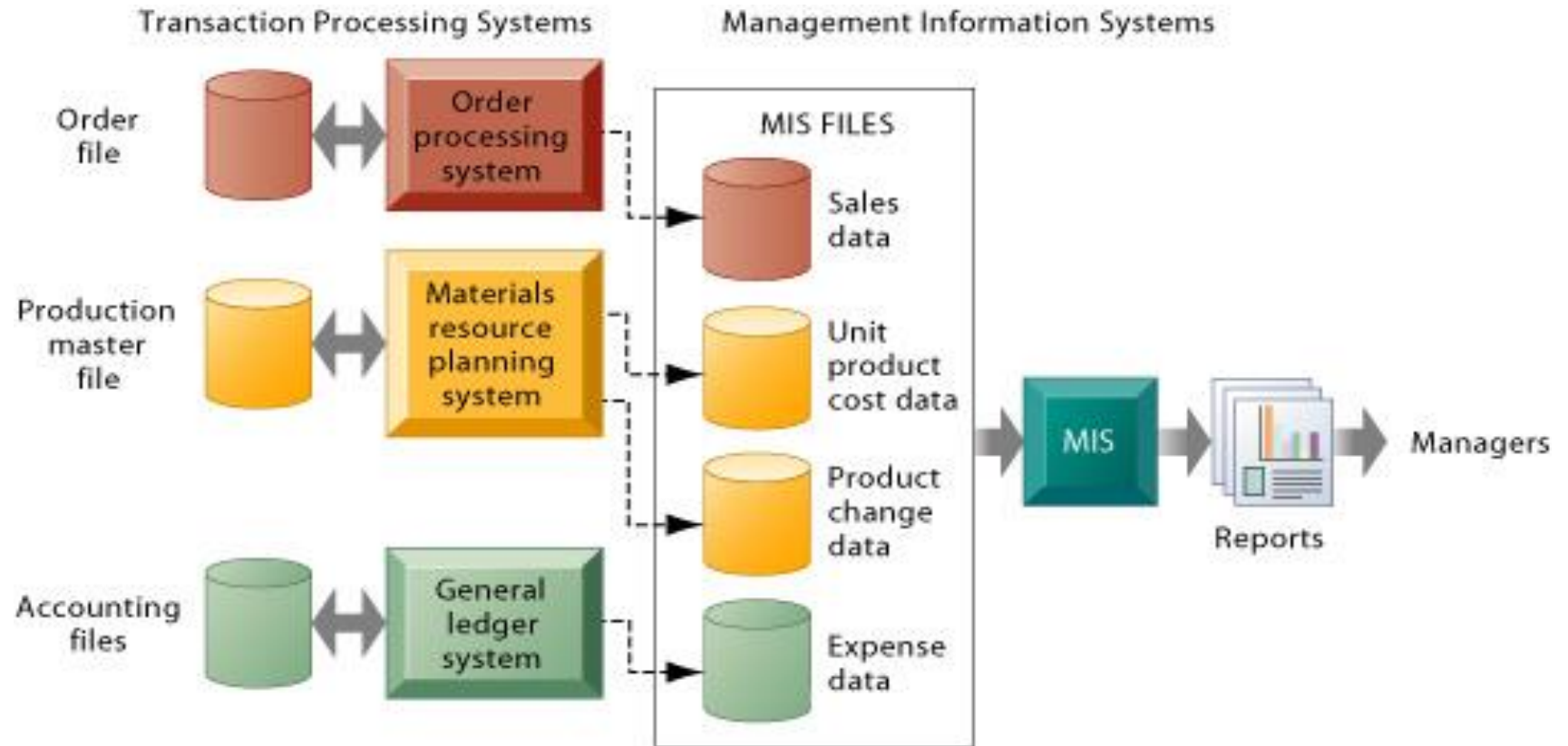
Perspectives of Information Systems

Information system:

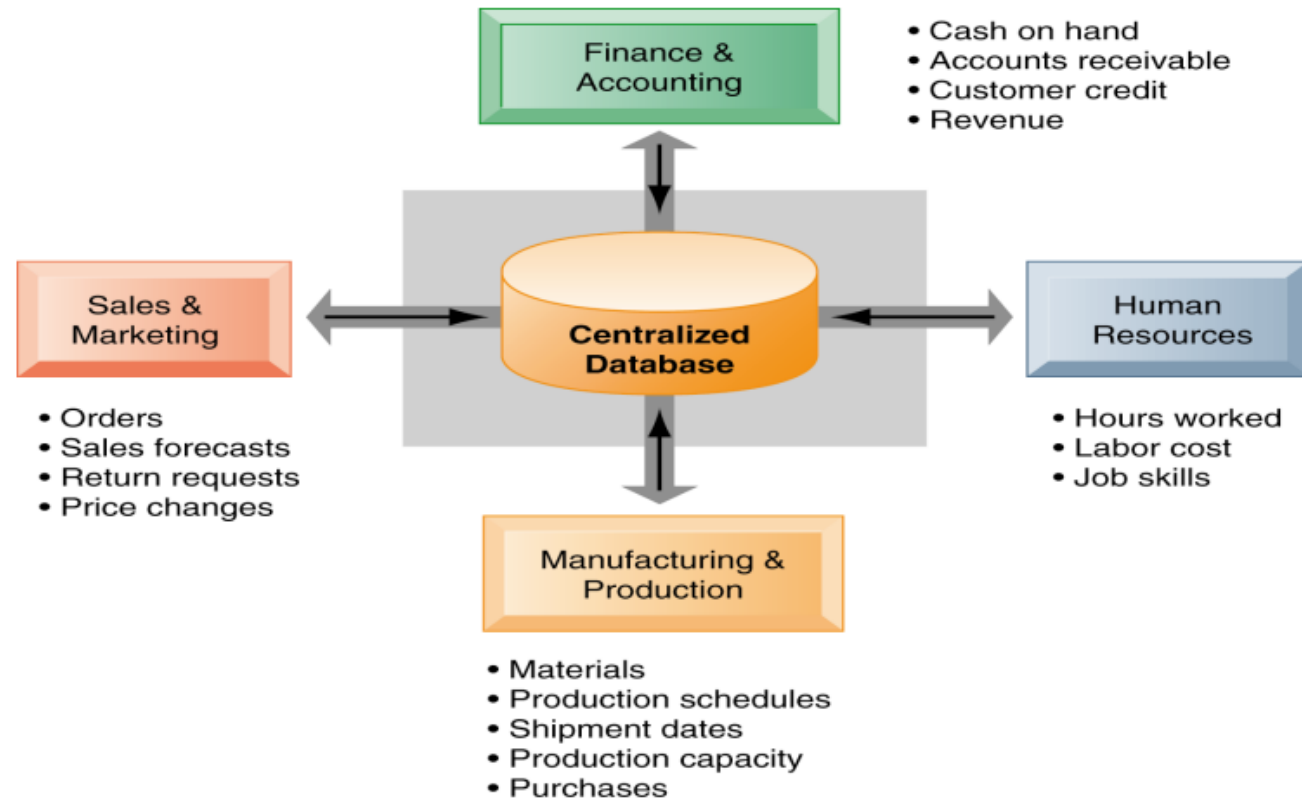
- Set of **interrelated components**
- Collect, process, store, and distribute information
- Support decision making, coordination, and control



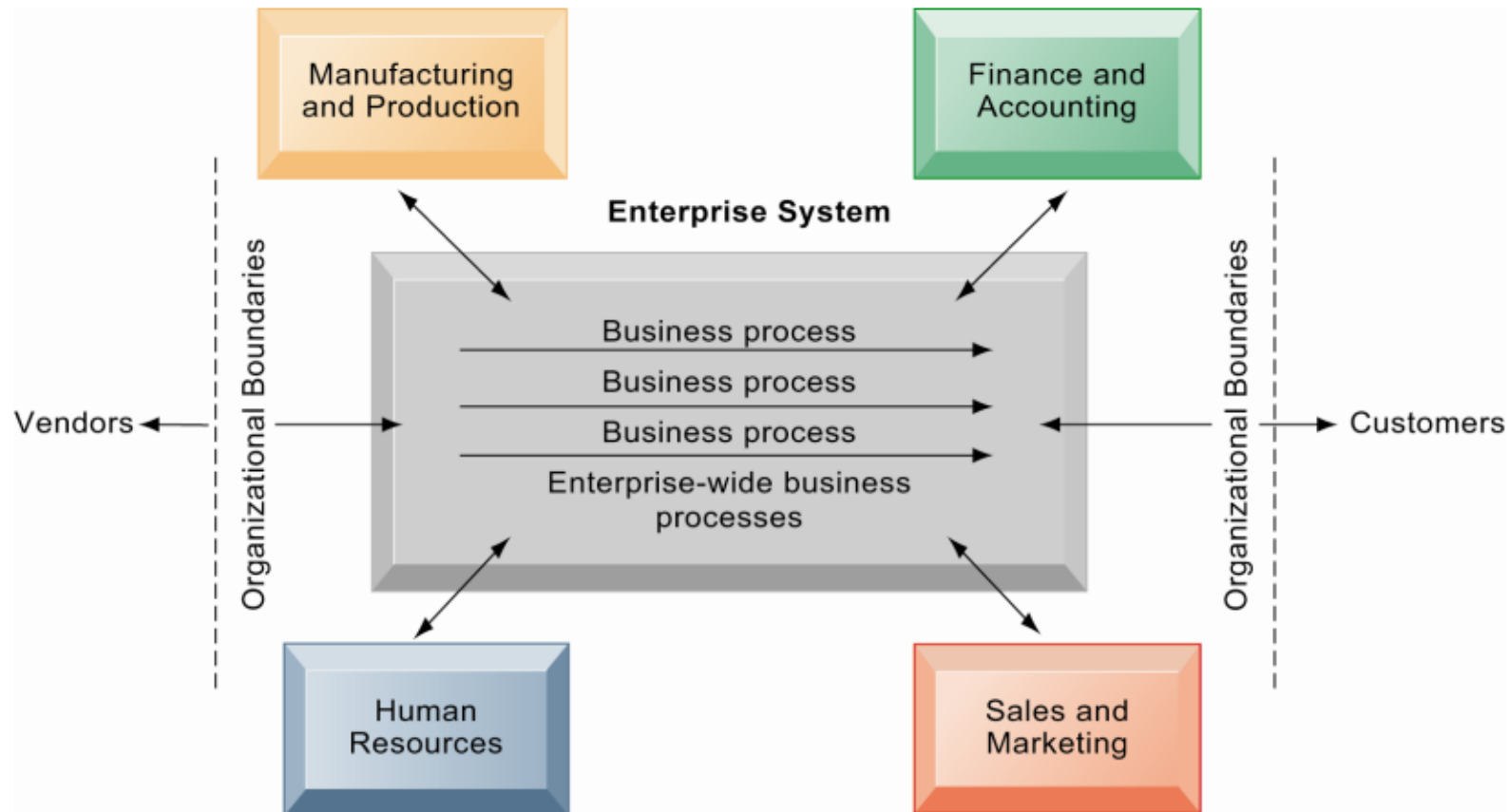
How Management Information Systems Obtain Their Data from the Organization's TPS ?



Enterprise Systems



Enterprise Systems



Types of modeling:

→ Structure/data modeling.

→ Behavior/process modeling.

Data Modelling

A **data model** describes conceptual structuring of data stored in database.

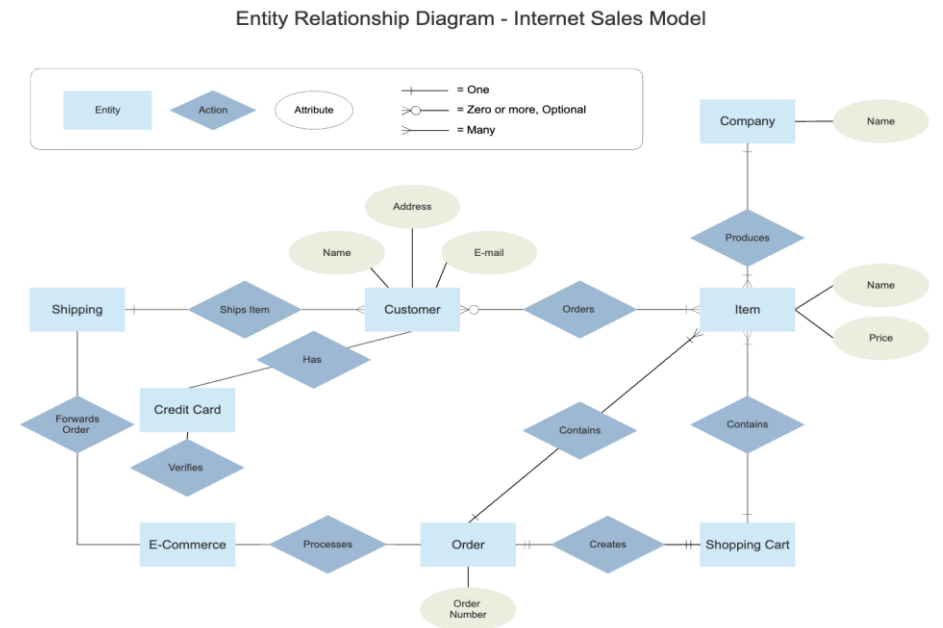
Data model provides a description of the database structure including:

- The data
- The relationships within the data
- The constraints on the data

An Entity is an abstract object of some sort.

GUC portal: Student, Course, Staff.

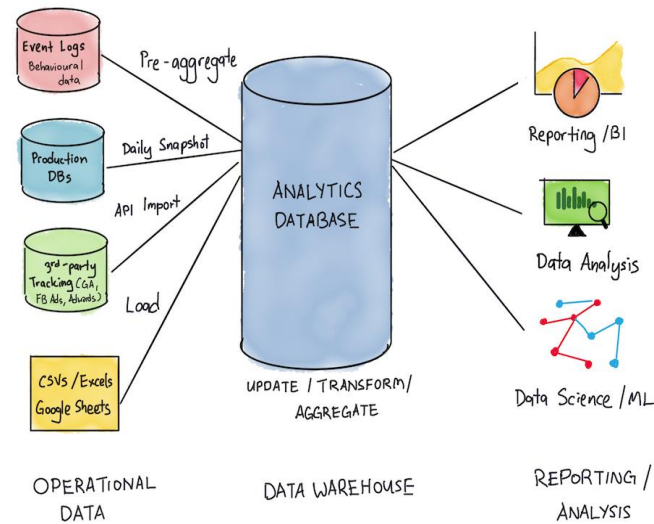
Airline system : Aircraft, Passenger, Flight, Airport.



Database VS Data Warehouse

Normalized

Current and daily operations



Denormalized

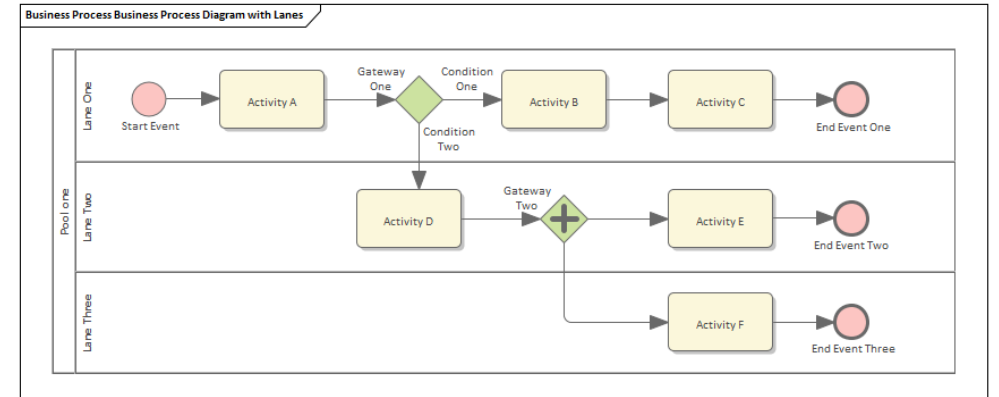
Historical

Process modelling

Modeling the organization's business process.

Purpose:

- Allows evaluating and improving the business process.
- It is used to map out an organization's current (or "as-is") processes to create a baseline for process improvements and to design future (or "to-be") processes with those improvements incorporated.
- This process design helps identify the business process activities to target or to tackle when implementing information systems for a business.



Q & A

The idea of using technologies to improve business operations and create new value for customers?

- ☐ Business Process Management
- ☐ Enterprise Systems
- ☐ Digitalization
- ☐ Information System

Q & A

The idea of using technologies to improve business operations and create new value for customers?

- ☐ Business Process Management
- ☐ Enterprise Systems
- ☐ Digitalization
- ☐ Information System

Answer: Digitalization

Q & A

Which of the following is a visual representation that helps in building databases?

- ☐ Process Model
- ☐ Information Architecture
- ☐ Database Models
- ☐ Entity Relationship Diagram

Q & A

Which of the following is a visual representation that helps in building databases?

- ☐ Process Model
- ☐ Information Architecture
- ☐ Database Models
- ☐ Entity Relationship Diagram

Answer: Entity Relationship Diagram

Q & A

A structured approach to improving the processes organizations is known as

- ☐ Information Management
- ☐ Enterprise Systems
- ☐ Business Process Management
- ☐ Information System

Q & A

A structured approach to improving the processes organizations is known as

- ☐ Information Management
- ☐ Enterprise Systems
- ☐ Business Process Management
- ☐ Information System

Answer: Business Process Management

Q & A

Enterprise systems helps in data integration among all functional areas in an organization.

- ☐ True
- ☐ False

Q & A

Enterprise systems helps in data integration among all functional areas in an organization.

- ☐ True
- ☐ False

Answer: True



System analyst

Job Description:

- Implement, maintain and support IT and IS to meet the business needs of the organization.
- Analyze and create tests.
- Develop specifications and requirements for developers and programmers.



System Analyst

[Apply Now](#) →

Introduction

At IBM, work is more than a job – it's a calling: To build. To design. To code. To consult. To think along with clients and sell. To make markets. To invent. To collaborate. Not just to do something better, but to attempt things you've never thought possible. Are you ready to lead in this new era of technology and solve some of the world's most challenging problems? If so, let's talk.

Your Role and Responsibilities

- As a Systems Analyst you need to support Talent Shared Services Service Delivery Teams through supporting the design process, creating innovative solutions, and deploying systems that are scalable, flexible and with minimal ongoing maintenance needs. The key responsibilities of the role include:
- Create and maintain scalable and flexible solutions with various technologies for individual teams up to a global audience consisting of 300k+ users
- Think creatively and provide innovative suggestions to improve process effectiveness and/or efficiency and overall solution design
- Support existing technology managed by the team
- Support special projects/requests within the team on an ad-hoc basis

PEPSICO

Data Management and Operations Assistant Analyst

PepsiCo · New Cairo, Cairo, Egypt

4 days ago · 57 applicants

[See who PepsiCo has hired for this role](#)[Apply](#)[Save](#)

Overview

PepsiCo operates in an environment undergoing immense and rapid change. Big-data and digital technologies are driving business transformation that is

[Show more](#)

Seniority level
Not Applicable

Job function
Management and Manufacturing

Employment type
Full-time

Industries
Food and Beverage Services and Manufacturing

Business analyst

Job Description:

- Conduct Market Analysis.
- Analyze product line and overall profitability of the business.
- Develop and monitor data quality metrics and ensure that business data and reporting needs are met.





RSA Security
New Cairo City

[Apply on Talent.com](#)

Full-time

AWS Business Analyst / Developer - Netwitness

As one of the most established cybersecurity companies in the world, we at NetWitness are hard at work every day helping our customers and partners better protect their organizations from cyberattacks.

Our products and incident response services are used within most large enterprises, governments and militaries for incident response and threat hunting.

Our Sales Professionals, Sales Engineers and Professional Services Consultants design and deliver solutions for potential and existing customers to enable better visibility, insight and action to prevent and defend against attacks.

NetWitness provides the unique ability to provide one single platform with a unified view across all attack surfaces including Network, Logs / SIEM, Endpoint and IoT combined with our AI-based User and Entity Behavioral Analysis (UEBA) and Security, Orchestration, Automation & Response (SOAR) capabilities.

Responsibilities :

- Capture reporting and analytical requirements for stakeholder use cases.
- Design / build data model in Amazon Web Services (AWS) environment.
- Design / build transformation layer in AWS Redshift , Glue and QuickSight.
- Support stakeholders' enhancements and iterate and use cases post go live.
- Uses standardized processes for requirements definition, analysis, design, construct, and test activities.
- Automate repeatable tasks to create efficiencies in our workflows and enable freedom for innovation.
- Development and support of multiple AWS solutions to support critical business applications.

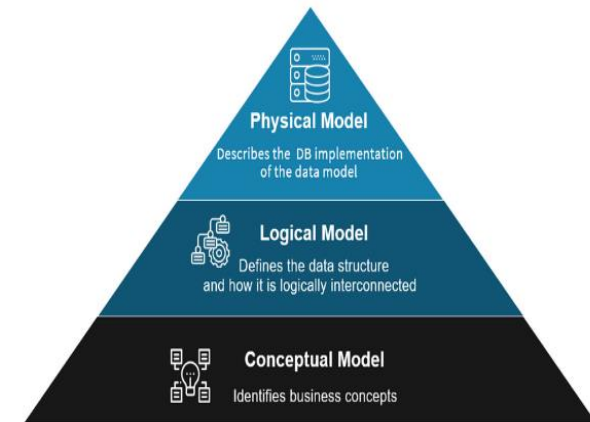
Required Skills & Experience :

- 6+ years' experience as a business analyst designing BI tools.
- 3-5+ years' experience with S3, AWS (Glue, QuickSight and Redshift) and any ETL tools.
- Resource must have in any ETL / ELT process, SQL / Postgresql, Python and AWS (S3, Glue, Redshift & QuickSight).
- Experience modelling data from and / or NetSuite.
- Experience with data analysis and data governance methodologies.
- Solid experience in complex data modelling, data governance, and data management practices.

Database Modeler

Job Description:

- Data modelers are responsible for developing data models, transform business information into models by engaging with business users.
- Refine conceptual, logical and physical models.





Data Warehouse Engineer

ITS - Kuwait City, Kuwait



Apply For Job

Job Categories:

Engineering - Telecom/Technology

Skills And Tools:

Data Warehouse Engineering Computer Science Computer Engineering Information Technology (IT) Banking Oracle SQL Sybase Database Software Engineering .Net JavaScript

Job Description

- 10+ years of IT experience in Development, Implementation of applications using SQL, PL-SQL, Oracle, Sybase ASE, Sybase IQ and Microsoft APS (Analytics Platform System)
- Good Experience in writing complex SQL Queries with good knowledge and hands on in Oracle/Microsoft APS (Analytics Platform System) Database like Database queries, Cursors, Stored Procedures, Functions, and Packages in PL/SQL.
- Good Knowledge to Data Warehousing Concepts and conceptual/physical data Model design
- Good Knowledge on different source system like Finacle, Phoenix, IMAL (path solutions), IFRS9, ACM and AMBIT FOCUS (FIS Solutions) as we extract data from mentioned source systems.
- Good Knowledge in Supporting & Developing Regulatory Reporting systems (like : XLerator Fintellix Application)
- Good Exposure on performance tuning of the database and SQL queries for different databases.
- Good competence in Analyzing and problem solving.
- Good knowledge on Finance domain (Core Banking).
- Capable of working independently and as well as part of a team.
- Good Knowledge in programming language such as Visual studio .net , Java Script.
- Good interpersonal, communication and fast learning skills.
- Highly adaptive to any type of work environment and technology.
- Good knowledge for Database (RDBMS) such as Oracle 11g and higher , Microsoft APS , SQL-Server and Sybase ASE & IQ
- Good knowledge of ETL/ELT tools such as Informatica PowerCenter 9.6.1 and higher
- Capable of writing BRD (Business Requirement Document) and FSD (Functional Specification Document)

Business Intelligence Consultant

Job Description:

- Examine company data to improve its efficiency decision making and overall performance.





Business Intelligence (BI) speci...

Johnson Controls - Nasr City, Cairo



Apply For Job

standards.

- Administer design of Business Intelligence projects and develop dashboards and operations for reports.
- Develop reports and dashboards on SQL servers.
- Prepare test cases and plans and perform tests on systems.
- Install and assist to configure various Business Intelligence tools.
- Perform troubleshoot on all Business Intelligence tools and assist in resolution.
- Monitor monthly release cycle and perform unit tests for Quality Assurance

Job Requirements

- Minimum 3-5 years of experience
- Bachelor's degree of computer technology or related fields
- Experience in in developing BI dashboards
- In-depth understanding in data warehouse design (e.g. dimensional modeling) and data mining
- In-depth understanding of database management systems, online analytical processing (OLAP) and ETL (Extract transform, load) framework
- Familiarity with BI technologies (e.g. Microsoft Power BI, Oracle BI)
- Experience with tier-one applications, databases, and data warehouses
- Hard knowledge of SQL queries, SQL Server Reporting Services (SSRS) and SQL Server Integration Services (SSIS)
- Strong understanding of relational database
- Strong ability to analyze user requirements and build front-end BI applications according to specifications structures
- Proven abilities to take initiative and be innovative
- Analytical mind with a problem-solving aptitude
- Understanding of Agile methodologies
- Knowledge & experience of UI.

Job Description

Job Summary:

BI specialist is specialize in manage BI , analytics solutions ,design and implement BI systems, including integration with databases and data warehouses. This includes selecting, blueprinting, gathering requirements, designing and rolling out BI solutions to end users. He/She is also responsible for ensuring high levels of BI availability through support functions and in-depth testing.

- Analyze user requirements and, based on findings, design functional specifications for BI front-end applications.
- Translate business needs to technical specifications
- Produce ETL design guidelines to ensure a manageable ETL infrastructure for the BI system.
- Design, build and deploy BI solutions (e.g. reporting tools)
- Create tools to store data (e.g. Tabular model)



Solution architecture

Job Description:

- Responsible for evaluating organization's business needs and determining how IT can support those needs.



Search

Solution Architect

What you'll be doing

- You'll have one or more target accounts, in partnership with the Account Executive, to develop a relevant, actionable account strategy and plan
- Actively work on the design, implementation and roll-out of solutions that meet your customer's challenges – so you'll need to see and assess your customer's 'as is' before you can provide them with their 'to be' solutions
- Inspire confidence in Teradata software and services through your professionalism and expertise to drive sales forward
- Provide technical leadership to the extended Teradata account team and ensure that other relevant SMEs are engaged at appropriate points throughout the sales cycle – you'll also work with the extended Teradata consulting team to scope projects and develop appropriate SOWs, project plans and risk analyses

Date	Lecture (Saturdays)	Tutorials (in same week)
Week 1 16 Sep. – 22 Sep.	Introduction to Information Management & Information + Communication Architecture	
Week 2/ Tut.1 23 Sep- 29 Sep	No Lecture (no teaching activities) Compensation on Wednesday Data, Information & Knowledge – Managing Corporate Information Resources <i>[textbook 1: <u>ch. 7</u>++]</i>	Intro. to modelling
Week 3/ Tut.2 30 Sep - 6 Oct	Holiday – Compensation on Thursday Database Modelling: Fundamental Concepts I <i>[textbook 3: <u>ch. 2</u>]</i>	Conceptual modeling → <i>Quiz 1 announcement</i>
Week 4/ Tut.3 7 Oct- 13 Oct	Database Modelling: Fundamental Concepts II <i>[textbook 3: <u>ch. 2</u>]</i>	Logical and physical modeling → <i>Assignment 1 announcement (in pairs-Data modeling)</i> → Quiz 1
Week 5/ Tut.4 14 Oct- 20 Oct	Data warehouse Modeling <i>[<u>t.b.a.</u>]</i>	Multidimensional modeling → <i>Quiz 2 announcement</i>
Week 6/ Tut.5 21 Oct- 27 Oct	Business Process Modelling: Intro [textbook 4, <u>ch. 4</u>]	Behavior/process modeling → <i>Assignment 1 submission</i> → <i>Quiz 1 feedback to students</i> → Quiz 2
28 Oct - 6 November	Midterm	
Week 7/ Tut.6 7 Nov- 13 Nov	Data warehouse Modelling: Analysis <i>[textbook 3: <u>ch. 5</u>]</i>	SAP Accounts + SAP BW exercise 1 → Assignment 2 announcement (Lab work) → Midterm feedback to student
Week 8/ Tut.7 14 Nov- 20 Nov	Business Process Modelling: BPMN [textbook 4, <u>ch. 4</u>]	SAP BW exercise 2 → Final project announcement
Week 9/ Tut.8 21 Nov- 27 Nov	Designing Information Architectures I <i>[textbook 2: <u>ch. 9</u>]</i>	SAP BW exercise 3 → <i>Quiz 3 announcement</i>

Date	Lecture (Saturdays)	Tutorials (in same week)
Week 10/ Tut.9 28 Nov - 4 Dec	Planning & Designing the Corporate IT Architecture [textbook1: ch 4+5] <i>Enterprise Information Management, Processing & Integration</i>	SAP BW exercise 4 → Quiz 3
Week 11/ Tut.10 5 Dec- 11 Dec	Supporting IT-Enabled Collaboration and Knowledge Work [textbook 1: ch 13 + 14] Strategic Uses of Information Technology	Final presentations (10% bonus, 5 per team → Assignment 2 submission (last day of tutorials for all)
Week 12/ Tut.11 12 Dec- 18 Dec	Revision + Final Exam announcements + Final Project Competition announcement	Final Presentations → Submit final project report
Week 13 26 Dec. – 14 Jan.	Finals	

Assessment	Weight of Final Grade
Final Exam	40%
Midterm Exam	20%
Assignment + Quizzes (3)	20%
Lab Report	10%
Final Project	10%
Total	100%

thank
you