



Jordan Youth Innovation Forum
الملتقى الأردني للإبداع الشبابي



3. Digital

3.1 General principles, mechanisms and logic underlying evolving digital technologies.

Jordan Youth Innovation Forum

Duration: 6.5 Hours



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Project Consortium

Coordinator:



Partners:



Jordan Youth Innovation Forum
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Project Details

Title: “Joint Development, Piloting, and Validation of Entrepreneurial Mindset and Key Skills Curricula and Training Materials for Third Countries”

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End Date: 31.12.2025

General Principles, Mechanisms, and Logic Underlying Evolving Digital Technologies

Training Aim

The aim of this training is to equip participants with a clear understanding of digital technologies and how they function. Through practical activities and case studies, they will learn to apply digital principles and stay updated on emerging trends. By the end of the training, participants will be able to confidently use digital tools and make informed decisions for implementing digital solutions in their ventures.



General Principles and Mechanisms of Emerging Digital Technologies

Learning Outcomes

In terms of **knowledge**:

- ✓ *Define digitalization and name evolving digital technologies.*

In terms of **skills**:

- ✓ *Analyze and apply digital information management techniques to retrieve data from reliable sources.*
- ✓ *Demonstrate understanding by adhering to the general principles and mechanisms of digital technologies.*
- ✓ *Evaluate and respect the logic behind the evaluation of digital technologies*

In terms of **attitudes**:

- ✓ **Respect** GDPR, data protection, and ethical standards when using digital technologies.
- ✓ **Demonstrate** confidence in practicing proper online etiquette and netiquette in digital interactions.
- ✓ **Apply** strategies to safeguard oneself and others from online threats and risks

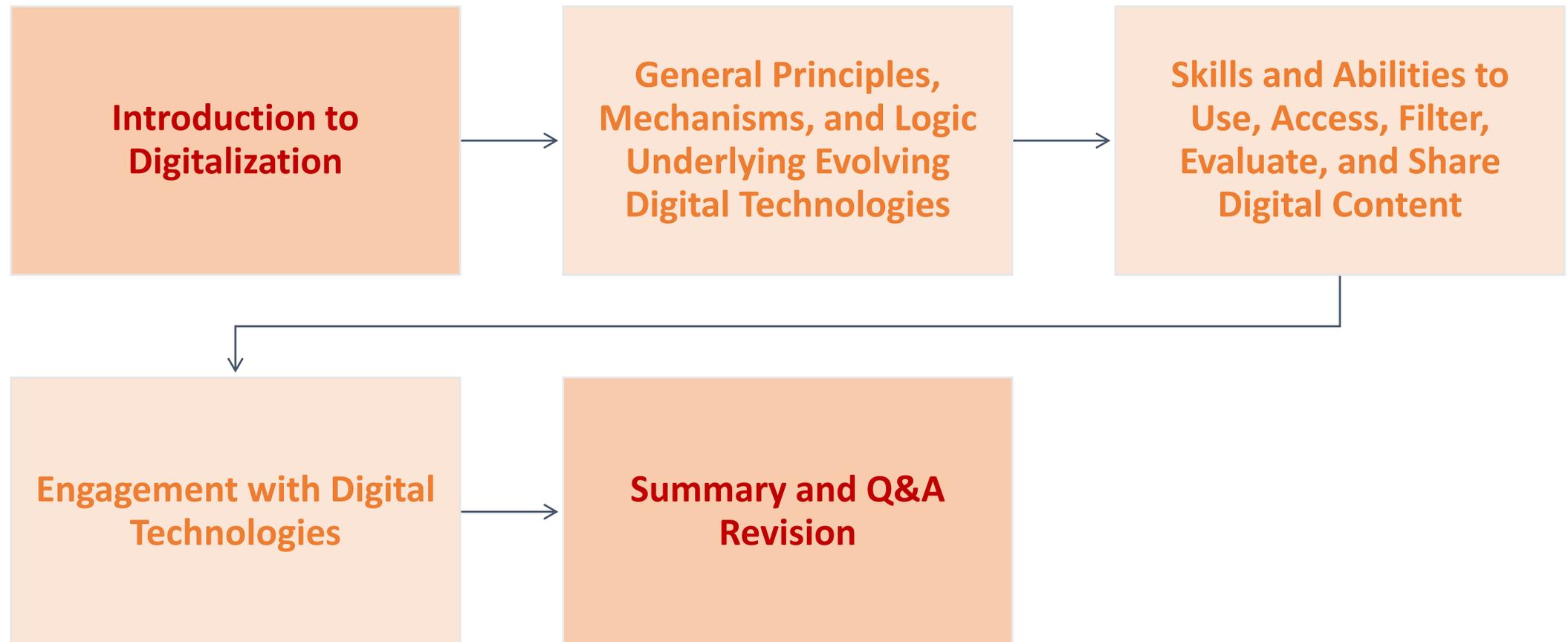
ERF: The European Reference Framework (Key Competences for Lifelong Learning)



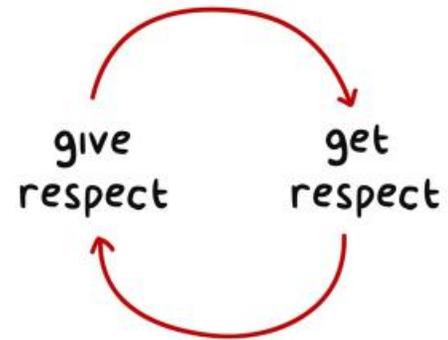
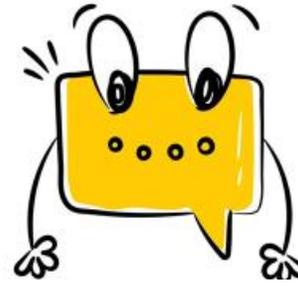
Digital competence is the ability to use digital technologies confidently and responsibly in personal and professional context. This course will cover this principle and mechanisms of digitalization, focusing on data protection and GDPR compliance. Participants will explore the evolving digital landscape and learn to apply digital management skills for data safety, accuracy, and ethical use.

What ERF competence is our training about?

Training Route Map



Training Rules



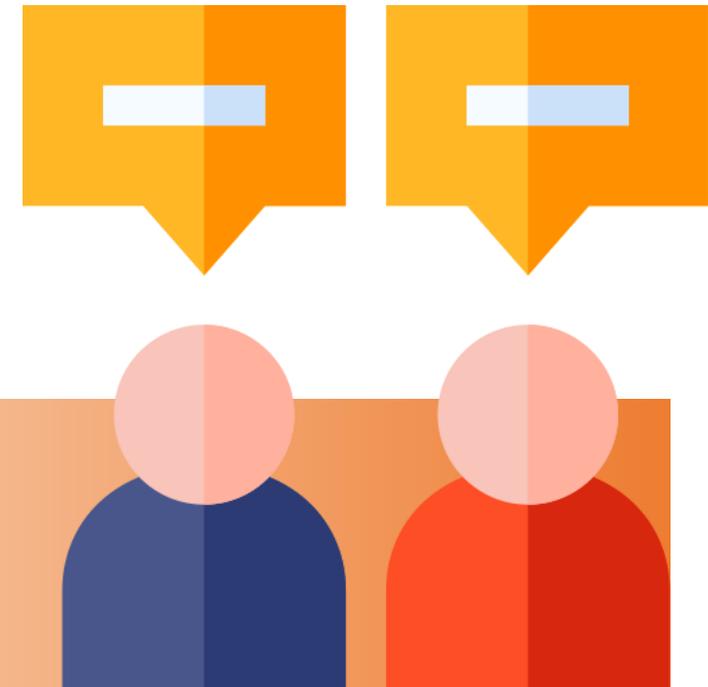
BREAK TIME



2 Facts and 1 Ambition



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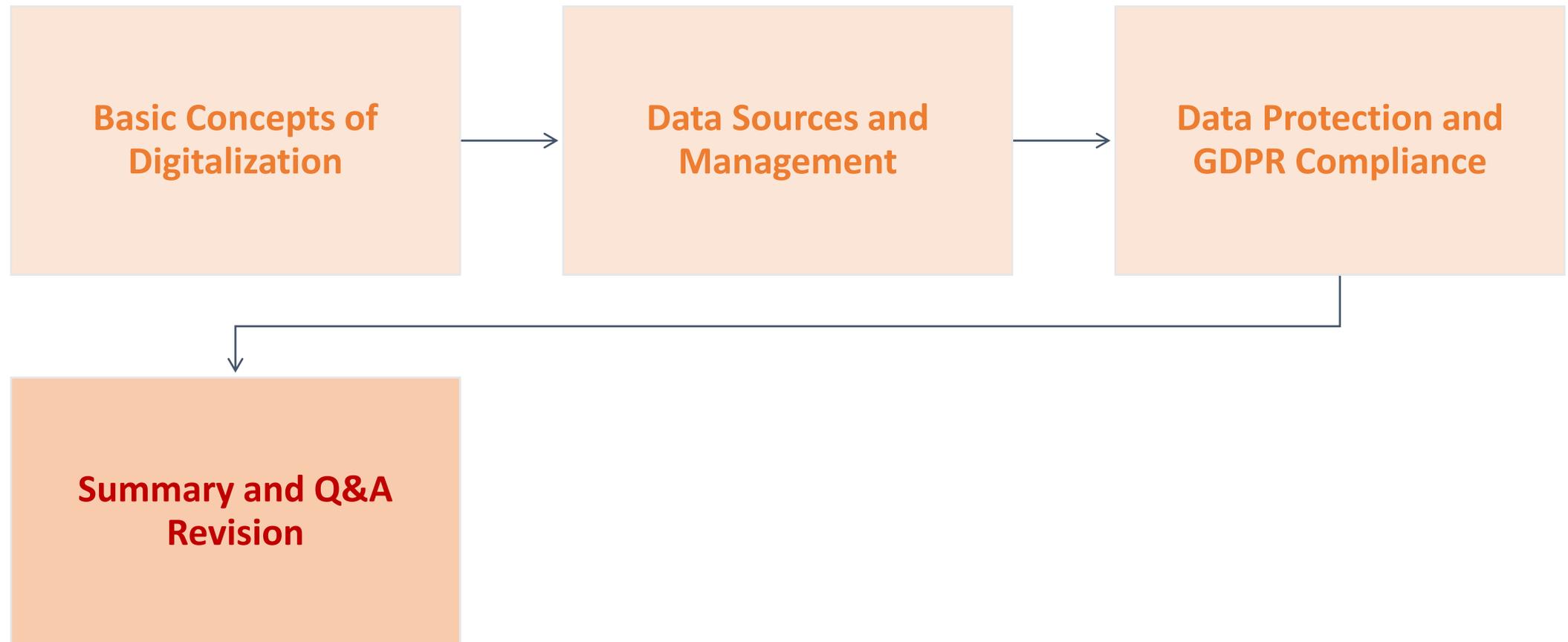
Introductions

Let's get to know each other!

“Technology is best when it brings people together.”

Matt Mullenweg, Founder of WordPress

Topic 1 Route Map



Topic 1: General Principles, Mechanisms, and Logic Underlying Evolving Digital Technologies

Introduction to Digitalization

- **Definition of Digitalization:**

Digitalization refers to the integration of digital technologies into everyday processes and activities, transforming how businesses, governments, and individuals operate. It involves converting information into a digital format, optimizing workflows, and enabling new ways of communication and service delivery. Digitalization extends beyond merely digitizing existing data—it reshapes entire business models, economic sectors, and societal functions by harnessing the power of digital technologies to create value, improve efficiency, and enhance experiences.





Aspects and Examples

- **Key Aspects:**

- **Automation:** Replacing manual tasks with automated digital processes, improving speed and reducing human error.
- **Data-Driven:** Leveraging digital data to make informed decisions, analyze trends, and predict future outcomes.
- **Connectivity:** Enhancing communication through networks and the internet, allowing real-time collaboration across geographic boundaries.
- **Innovation:** Digitalization enables the creation of new products, services, and even industries by utilizing technological advancements.

- **Examples:**

- **Healthcare:** Using digital patient records, telemedicine, and AI-driven diagnostics.
- **Retail:** E-commerce platforms transforming the way customers shop and interact with brands.
- **Education:** Online learning platforms providing access to education for students worldwide.

3.1.1 : Basic Concepts of Digitalization

Digital Buzzwords Unlocked

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“It’s not the strongest or the most intelligent who will survive, but those who can best manage change.” — Charles Darwin

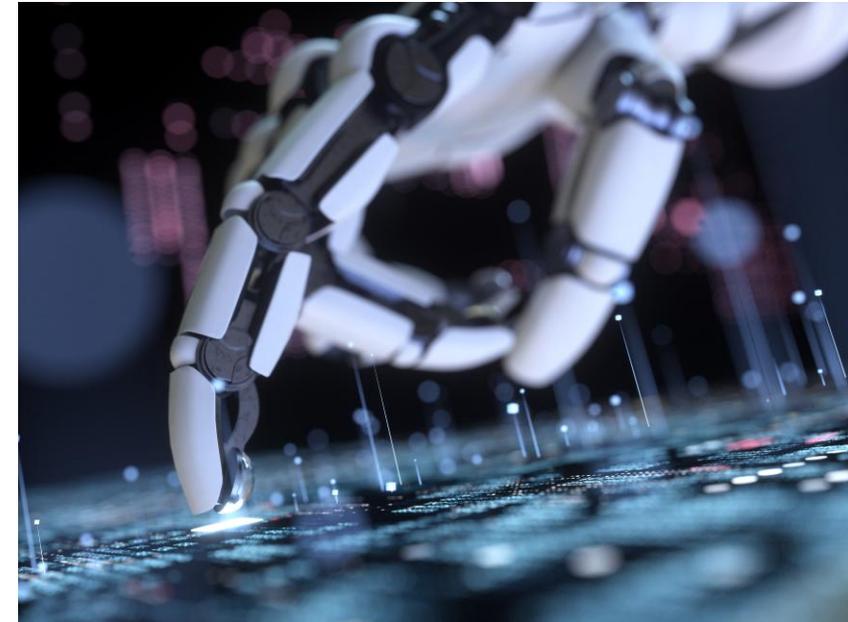
3.1.1 Basic Concepts of Digitalization

What is digitalization? Digitalization is the process of using digital tools and technologies to improve processes, create efficiency, and provide services. It is about transforming traditional methods into modern, tech-driven ones.

Why do we need digitalization? In today's fast-paced, technology-driven world, businesses need to adapt to stay relevant. Manual processes slow operations, increase costs, and fail to meet evolving customer expectations.

How Digitalization Helps:

- Streamlines Operations:** Automates tasks to save time and reduce delays. Tasks that once took hours can now be done in minutes.
- Enhances Customer Experience:** Enables personalized interactions, such as AI-driven recommendations, to better connect with customers.
- Cuts Costs:** Reduces reliance on physical infrastructure and manual labor. For instance, banks now manage customer accounts digitally, eliminating the need for in-person visits.



Digitalization Vs Digitization

Digitalization vs. Digitization:

•**Digitization** is the process of converting analog information into a digital format (e.g., scanning documents).

•**Digitalization** is the broader process of using these digitized assets and incorporating digital technologies into business processes to drive improvements and innovations.

Aspect	Digitization	Digitalization
Focus	Converting analog data into digital form	Using digital tools to transform processes
Scope	Limited to conversion	Broader scope that impacts business processes
Example	Scanning documents	Automating document management and workflow
End Goal	Digital representation of physical data	Improved efficiency, innovation, new business models
Type of Change	Static (format change)	Dynamic (process transformation)
Impact	Easier access to information	Increased efficiency, enhanced customer experience, and innovation

Digital or Digitalized?



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Challenges of Digitalization

Data Privacy and Security:

As more data is generated and stored digitally, the risk of cyber-attacks and data breaches increases. Protecting sensitive data and ensuring compliance with regulations like GDPR is crucial.

Digital Divide:

Not all regions or individuals have equal access to digital technologies, creating a digital divide between those who can benefit from digitalization and those who cannot.

Resistance to Change:

Organizations often face resistance to digital transformation due to the complexity of new technologies, the need for upskilling employees, and cultural shifts within the workplace.



Digitalization Impact

Society:

Communication: Real-time global communication through social media and messaging platforms.

Education: E-learning and remote education make knowledge more accessible.

Healthcare: Telemedicine improves access to care and patient data management.

Challenges: Digital divide, privacy concerns, and the rise of cyberbullying.

Economy:

Automation: Increases efficiency, reduces costs, and enhances productivity.

New Business Models: Gig economy, e-commerce, and digital entrepreneurship (e.g., Uber, Airbnb).

Global Market Expansion: Digital platforms allow businesses to reach global markets.

Data as an Asset: Companies leverage big data for personalized marketing and business insights.

Challenges: Job displacement due to automation, market monopolies, and regulatory concerns.

3.1.2 : Data Sources and Management

3.1.2 Data Sources and Management

What are Data Sources?

- Internal Data Sources:

- Data generated within an organization, such as sales figures, customer records, employee information, and product data.

- External Data Sources:

- Data that comes from outside the organization, including market research, social media data, competitor analysis, and data from government reports.

Examples:

Retail: Customer purchase history, online user behavior.

Healthcare: Patient records, treatment outcomes.

Finance: Transactional data, market trends.

Data Collection, Storage, and Organization



- **Data Collection Methods:**
- **Surveys:** Collect customer feedback/preferences.
- **Digital Transactions:** Track online purchases and behavior.
- **Sensors:** Gather environmental/operational data via IoT devices.
- *Example:* E-commerce platforms track customer purchases.
- **Types of Data Storage:**
- **Cloud Storage:** Online, scalable, and accessible (e.g., Google Cloud, AWS).
- **Physical Servers:** On-site storage with more control but higher maintenance.
- *Example:* Companies use cloud storage for scalability and cost reduction.
- **Data Organization:**
- **Structured Data:** Organized in rows/columns (e.g., SQL databases).
- **Unstructured Data:** Includes images, social media, emails (needs advanced tools).
- *Example:* Retailers use databases for real-time analysis.



Data Retrieval, Protection, and Security

How we handle Data:

- **Data Retrieval:** Access data efficiently using databases and metadata.
 - A. Example:** Retailers track inventory in real-time.
- **Data protection:** secure sensitive data with encryption and GDPR-compliant measures.
 - A. Example :** Banks protect accounts with multi-factor authentication

Key Takeaway:

GDPR compliance, efficient retrieval, and strong security measures ensure data is safe and legally protected.



Data Management Tools and Automation



- **Data Management Tools**
- **Databases:** Organize and find information easily.
 - *Example: Stores track stock and sales with databases.*
- **Cloud Storage:** Save and share files online anytime.
 - *Example: Teams use Google Drive for shared work.*
- **Big Data Tools:** Analyze large data for insights.
 - *Example: Social media suggests content based on your activity.*
- **Automation Benefits**
- **Fixes Mistakes:** Cleans data automatically (e.g., merging duplicate records).
- **Speeds Up Tasks:** Updates data in real-time (e.g., online store stock).
- **Predicts Trends:** Suggests actions based on past data (e.g., future inventory needs).
- **Key Takeaway:**
Tools and automation make managing data easier, faster, and smarter.

Data Management Tools and Automation

- **How Automation Helps with Data:**
 - 1. AI Cleans Data:** Finds and fixes errors automatically.
 - *Example:* Combines duplicate customer records into one.
 - 2. Machine Learning Analyzes Data:** Predicts trends and gives useful insights.
 - *Example:* Helps businesses understand what products customers want.
 - 3. Real-Time Processing:** Handles data instantly for faster decisions.
 - *Example:* Updates online store stock and prices during sales.
- **Key Takeaway:**

Automation makes data more accurate, provides smarter insights, and speeds up decision-making.



Case Study and Summary

Case study: Online Store Inventory Updates

An online store faced challenges keeping product availability updated during sales., Using automation, they implemented a real-time inventory system:

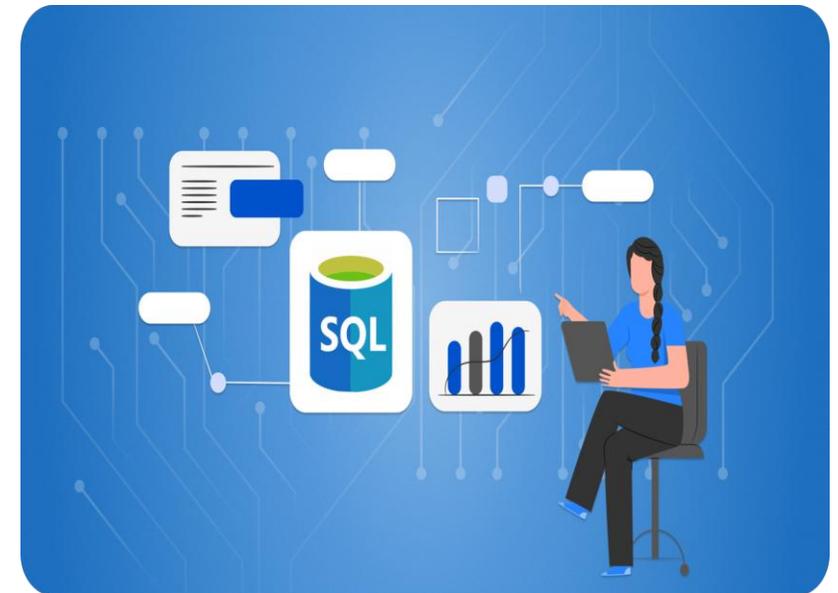
- **Problem solved:** Products would appear in stock online even when sold out, leading to unhappy customers.
- **Solution:** Automation updated stock levels instantly after each purchase.
- **Results:**
 - A. Accurate inventory tracking.**
 - B. Fewer customer complaints.**
 - C. Faster restocking decisions.**

Summary: Automation helps businesses by keeping data accurate through real-time updates, saving time with automatic tasks, and improving customer satisfaction by providing better information. It streamlines data management, making it faster, easier, and more reliable.



Common Data Management Tools

- 1. Spreadsheets (e.g., Excel):** Easy for tracking and analyzing small data sets.
 - *Example: Tracking monthly sales.*
 - 2. Databases (e.g., MySQL):** Manage large data efficiently.
 - *Example: Retail stores track inventory and orders.*
 - 3. Cloud Storage (e.g., Google Drive):** Store and share data online.
 - *Example: Teams collaborate on shared files remotely.*
 - 4. Big Data Tools (e.g., Hadoop):** Analyze huge data sets for trends.
 - *Example: Social media platforms improve recommendations.*
- **Key Takeaway:**
These tools simplify storing, organizing, and analyzing data for better decisions.



Common Data Management Tools

- 1. Data Visualization Tools (e.g., Tableau, Power BI):** Turn raw data into easy-to-read charts and graphs.
 - 1. Example: Create sales dashboards to track monthly performance.*
 - 2. File Management Systems (e.g., SharePoint):** Organize and manage documents in one place.
 - 1. Example: Teams store and retrieve project files from a shared system.*
 - 3. Customer Relationship Management (CRM) Tools (e.g., Salesforce):** Manage customer data and interactions.
 - 1. Example: Track customer purchases and communication history.*
 - 4. Data Backup Tools (e.g., Acronis):** Securely save copies of data to prevent loss.
 - 1. Example: Automatically back up company records daily.*
- **Key Takeaway:** Different tools like CRMs, visualization platforms, and file systems make it easier to manage, analyze, and secure business data effectively.

Common Data Management Tools

Big Data Platforms:

- **Purpose:**
Big data platforms are designed to handle and process massive datasets, especially unstructured data like social media feeds, sensor data, or large volumes of customer interactions.
- **Examples:**
 - **Hadoop:** An open-source framework that stores and processes big data across clusters of computers. It can handle both structured and unstructured data.
 - **Apache Spark:** A fast, in-memory data processing engine that works on large datasets. Often used for real-time analytics, machine learning models, and large-scale data processing.
- **Key Use Case:**
A social media company uses Hadoop to process petabytes of user-generated content, including comments, posts, and photos, to generate insights into trending topics and user behaviors.



Automation in Data Management

The Role of Automation in Data Management:

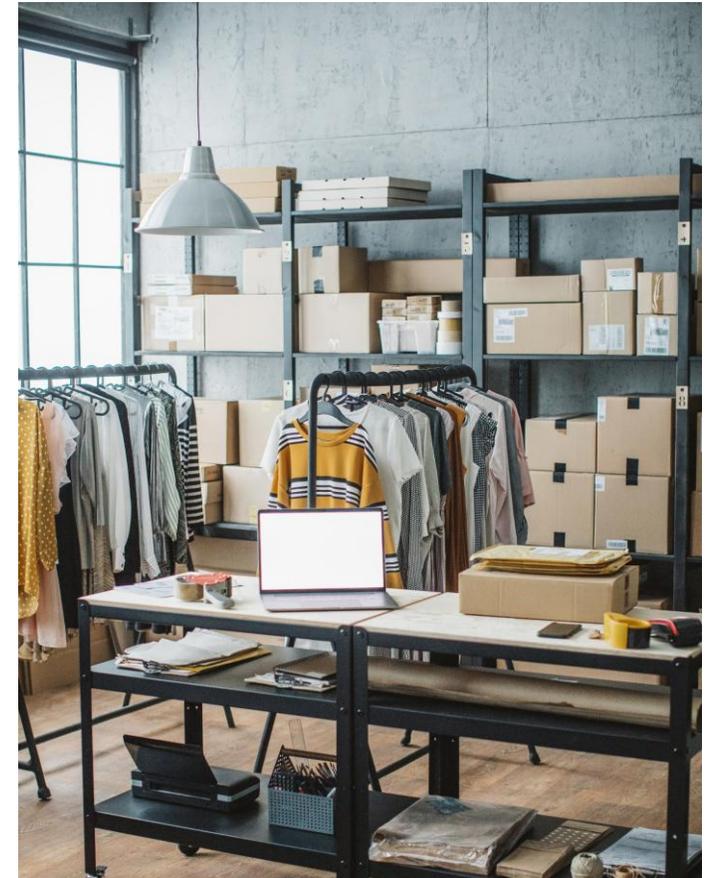
- Automation simplifies and speeds up routine tasks in data management, allowing businesses to focus on high-level strategic decision-making.
- Automation tools often involve **AI** and **machine learning**, which can identify patterns in data, correct errors, and predict future trends.

How AI and Machine Learning Automate Data Management:

- **AI-Powered Data Cleansing:**
AI algorithms can automatically identify and correct data inaccuracies, ensuring that data is clean and ready for analysis. This reduces manual effort and the chances of human error.
 - **Example:** An AI system used by a financial institution that automatically identifies duplicate or erroneous transaction records.
- **Machine Learning for Data Analysis:**
Machine learning models are trained to recognize patterns in data and make predictions. Over time, these models become better at identifying trends and anomalies.
 - **Example:** A retail company uses machine learning to predict customer behavior based on past purchase data, allowing them to create personalized marketing campaigns.
- **Real-Time Processing:**
Automated systems can process data in real-time, allowing companies to react quickly to changes in market conditions or customer behaviors.
 - **Example:** An online retailer automatically adjusts product pricing based on real-time demand using AI-driven tools.

Case Study - Data Management Transforming

- **Background:**
An e-commerce company struggled with slow customer service and frustrated clients due to a high volume of inquiries.
- **Solution:**
They implemented an AI chatbot to answer FAQs, track orders, and process refunds automatically, while forwarding complex issues to human agents.
- **Results:**
 - **Faster Responses:** 80% of inquiries were resolved instantly.
 - **Higher Satisfaction:** Positive reviews increased by 30%.
 - **Cost Savings:** Reduced support team costs by 40%.
- **Key Takeaway:**
Automation transformed customer service, delivering faster responses and happier customers while cutting costs.



3.1.3 : Data Protection and GDPR Compliance

3.1.3 Data Protection and GDPR Compliance

- **Definition:**

Data protection is the process of keeping personal and sensitive information secure from unauthorized access, loss, or corruption. It ensures data is only accessible to authorized individuals while maintaining its accuracy and availability.

- **The Key Pillars of Data Protection**

- 1. Confidentiality:**

1. Ensures sensitive data is private and only accessible to authorized individuals.
2. *Example:* Patient medical records are only accessed by doctors or authorized staff.

- 2. Integrity:**

1. Keeps data accurate and free from unauthorized changes or tampering.
2. *Example:* Online store transaction records remain accurate and unchanged.

- 3. Availability:**

1. Ensures data is available to authorized users whenever they need it.
2. *Example:* Bank customers can access their account details 24/7 through an app.



Key Takeaway: Data protection ensures data is safe, accurate, and available, building trust and ensuring smooth operations in today's digital world.

Importance of GDPR Compliance

- **Fines and Penalties:**
Non-compliance with GDPR can lead to fines up to €20 million or 4% of global annual revenue, whichever is higher. *Example:* A tech company was fined for improper data consent.
- **Building Customer Trust:**
Responsible data handling builds customer confidence. Transparent practices show respect for privacy, fostering loyalty and engagement.
- **Preventing Data Breaches:**
GDPR safeguards, like encryption and access controls, protect against data breaches, avoiding financial and reputational damage. *Example:* Companies with strict security measures are less likely to suffer breaches.

Key Takeaway: GDPR compliance not only avoids legal penalties but also fosters customer trust and reduces the risk of data breaches.

Information Reliability

Definition of Information Reliability:

- **Accuracy:** Data correctly reflects real-world scenarios.
- **Consistency:** Data remains uniform across systems and over time.

Why is Reliable Data Critical?

- **Business Decisions:** Accurate data leads to better decision-making (e.g., sales forecasting, inventory management).
- **Legal Compliance:** Industries like healthcare and finance require accurate data to meet regulatory requirements (e.g., GDPR, HIPAA).

Example:

A retailer using reliable sales data avoids overstocking or understocking products.



Challenges and Best Practices for Information

Challenges

- **Human Error:** Mistakes during manual data entry.
- **Inconsistent Data Collection:** Different departments using varied formats.
- **Outdated or Duplicated Data:** Records becoming outdated or existing in duplicate.

Example:

An incorrect customer address causes shipping delays.

Best Practices

- **Regular Audits:** Periodically reviewing data to identify and correct errors.
- **Automated Tools:** Using tools to validate and clean data (e.g., flagging duplicates).
- **Data Governance Policies:** Setting rules for data collection, storage, and processing to ensure consistency across departments.

Example:

A company using data validation tools reduces entry errors and ensures data quality.

Activity: GDPR Decision-Making Challenge



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Revision-Summary and Q&A

Revision-Summary

Recap of Key Points

- **Basic Concepts of Digitalization:**
 - Digitalization refers to the use of digital technologies to transform business operations and processes.
 - Key concepts such as automation, efficiency, and enhanced customer experience were discussed in detail.
- **Data Sources and Management:**
 - We explored various data sources (internal and external) and the importance of data organization and retrieval.
 - Key takeaways include understanding the role of cloud storage, structured vs. unstructured data, and ensuring data reliability through best practices like audits and governance.
- **Data Protection and GDPR Compliance:**
 - We discussed the importance of protecting personal data and the role of GDPR in ensuring privacy and compliance.
 - The session covered key GDPR principles, including consent, transparency, accountability, and data minimization, along with real-world case studies on data breach responses.

Q&A

Topics for Discussion:

- How to ensure ongoing GDPR compliance in different sectors (e.g., retail, healthcare, finance).
- Challenges in managing large datasets and ensuring data reliability.
- How digitalization impacts organizations and potential pitfalls in adopting digital technologies.

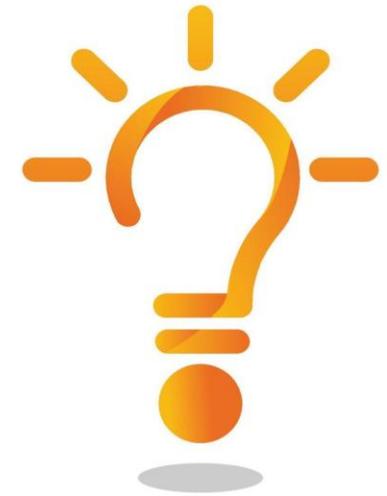
Individual Reflection Quiz



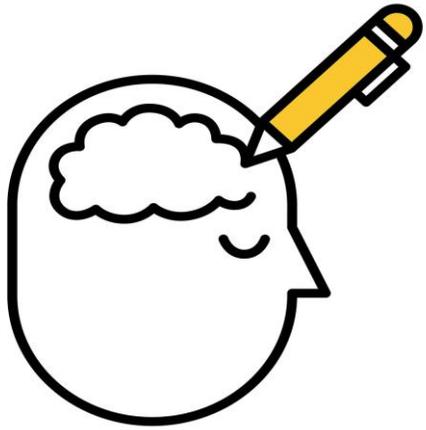
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- ✓ **General Principles of Digitalization:**
 - ✓ Digitalization: Enhances efficiency, automation, and customer experience.
 - ✓ Data Management: Importance of organizing and protecting data.
 - ✓ GDPR Compliance: Ensuring data protection, transparency, and accountability.



Do you have any questions?



What will you keep from
today's training?

Training Evaluation

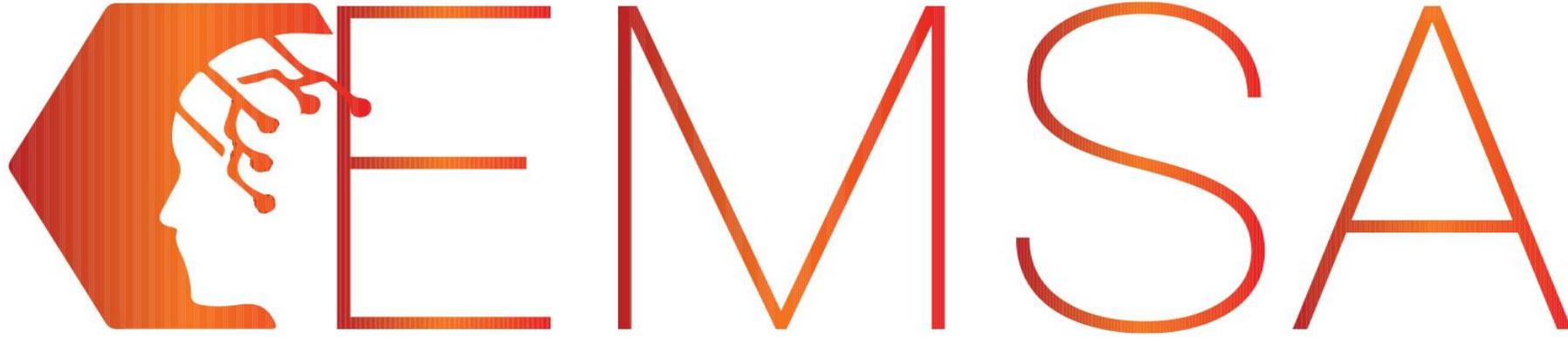


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4. **Westerman, G., Bonnet, D., & McAfee, A.** (2014). *Leading Digital: Turning Technology into Business Transformation*. Harvard Business Review Press. Available at: [Harvard Business Review](#)
5. **Kane, G., Palmer, D., Phillips, A., Kiron, D., & Buckley, N.** (2017). *Achieving Digital Maturity*. MIT Sloan Management Review. Available at: [MIT Sloan Review](#)

List of Suggested Resources for Self-Directed Learning

- **"Digital Transformation: Survive and Thrive in an Era of Mass Extinction"** – Thomas Siebel
Available at: [Amazon Link](#)
- **"The Fourth Industrial Revolution"** – Klaus Schwab
Available at: [World Economic Forum](#)
- **Coursera: *Digital Transformation Courses***
Available at: [Coursera](#)
- **"Digitalization and its impact on business models"** – McKinsey & Company
Available at: [McKinsey](#)
- **FutureLearn: *Introduction to Digitalization***
Available at: FutureLearn



Entrepreneurial Mindset and Key Skills for All

Thank you!



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