READER

DIGITAL MANAGEMENT TOOLS

Co-funded by
the European Union

1 Digitalisation and Digital Transformation

1.1 Digitisation, digitalisation, digital transformation

Scientists agree that compared to all other innovations, digital technology has developed most rapidly throughout history. In the past twenty years, digital technology has reached approximately 50% of the developing world's population and contributed to the transformation of societies[1]. In order to start talking about modern technological developments, it is worth clarifying the basic terms related to digitalisation.

Digitisation: Digitisation is the process of converting non digital (analogue) data or information to digital format, such as scanning, transferring music to MP3 format or recording physical sound into a digital file. The data remains unchanged, the format changes to digital and will become easily transferable, storable and searchable. Digitisation is the first and basic step of digitalisation and digital transformation, it lays the foundation for data-driven businesses[2].

Digitalisation: Digitalisation is a broader, more ambiguous term, which refers to the processes of combining the use of digitised data and technological tools. Examples for digitalisation include uploading and sharing documents with the help of a file sharing system, such as Dropbox or Google Drive. Digitalisation makes digitised data easy to use in various applications and contributes to the automation of business processes. It is basically the second step towards a new and optimal business model[3].

---

[1] https://www.un.org/en/un75/impact-digital-technologies

[2] https://morethandigital.info/en/digitization-digitalization-and-digital-transformation-explained-understanding-differences-incl-examples/

[3] Ibid.

Co-funded by
the European Union

Digital transformation: Digital transformation refers to the use of new, digital technologies to transform business processes and create digital culture e.g. within a company. Digitalisation has fundamentally changed the way we work nowadays. By optimising workflows, it contributes to greater efficiency, better business decisions and the production of business revenue opportunities. It can cover several, nearly all, levels of business operation, such as business strategy, operational processes, customer services and provide new opportunities for employee development[4].

1.2 Drivers of digital transformation

According to a survey conducted in 2021, 56% of the EU enterprises reached basic level of digital intensity, which means applying at least twelve selected technologies, such as using artificial intelligence, employing an ICT specialist or having e-commerce sales accounting for at least 1% of total turnover[5].   Large enterprises performed better with 88%, while only 55% of SMEs reached a basic level of digital intensity. If enterprises want to increase their competitiveness, they need to keep up with current digital transformation trends. Digital transformation drivers are understood as the reasons why enterprises embark on introducing new digital technology into their business processes[6].

The most important drivers for digital transformation contributing to the economic resilience of the enterprises include[7]:

- **New business models** are most often introduced to improve organisational resilience or e.g. to have more concern for corporate social responsibility (e.g. reduce environmental impact and improve social outcomes).
- **Growing customer experience and expectations** necessitate better protection of users' data and technology anticipating user's behaviour.
- **Modernising IT infrastructure** and technology on a regular basis ensures that outdated mechanisms do not hinder usual business processes.
- **Operational efficiency** is reached by streamlining business practices and processes existing within an organisation.
- **Constantly upgraded employee skills** ensure a group of knowledgeable workers the company can rely on. If a company plans to undergo major digital transformation processes, it has to invest in the development of the employee's skills with trainings, seminars, etc.

---

[4] Ibid.
[5] https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20220826-1
[6] https://www.walkme.com/blog/drivers-for-digital-transformation/
[7] Ibid.

- **Data** used for decision making have to be accessible, accurate, measurable, secure and easily comparable.
- **Strong collaboration** with stakeholders has to be maintained even if it means sharing data and information with external partners.

1.3 Current digital transformation trends

Enterprises should closely follow the most recent digital transformation trends to stay competitive on the market. The most popular digital transformation areas focus on data, technology, people and processes[8]. Currently (2023) the following trends are shaping the digital universe[9]:

- **Low-code or no-code platforms**: they offer simplified solutions for application development, meaning that without any formal expertise on ICT basically anyone in the company can build applications. Such technology can not only lower development costs, but also contributes to reducing digital skills gap.
- **Increased migration to cloud technology**: cloud computing services are becoming increasingly popular as the offer fast and easy solutions to improve business efficiency by supporting remote work, reducing operational costs, increasing collaboration, ensuring accessibility of people and ensuring data security.
- **Automation** of company workflows cuts down on repetitive and manual work, reduces costs and improves productivity and efficiency.
- Use of **Artificial Intelligence (AI) and Machine Learning (ML)** remain to be one of the main technological trends in the future and are used to analyse interactions, help estimate demand for services and recognize changing patterns of consumer behaviour.
- **Blockchain** is a shared database that keeps a secure record of continuously expanding list of data blocks. It ensures an unalterable record of the transactions and makes data changes traceable.

1.4 Future digital transformation trends

Without a doubt, digital transformation will continue to be shaping business processes in the future and become a strategic priority for all enterprises. Combined reports of Pluralsight and The McKinsey Global Institute anticipate the following 10 technologies to transform the global economy in the future[10]:

---

[8] https://www.fdmgroup.com/blog/digital-transformation-trends/
[9] Ibid.
[10] https://www.pluralsight.com/blog/career/tech-in-2025

Co-funded by
the European Union

- Mobile internet: evolving interfaces, formats, sensors and apps
- Artificial Intelligence and Machine Learning
- Virtual and Augmented Reality
- Cloud technology
- Internet of Things
- Advanced robotics
- Biometric technology
- 3D printing
- Genomics
- Blockchain

With the Digital Decade policy programme[11], coming into force in January 2023, the European Commission set targets to guide the digital transformation processes in Europe. The programme supports the objectives and target numbers set out in the 2023 Digital Compass[12] . The Compass defines four key areas of development: skills, government, business and infrastructures. As regards businesses, by 2030 three out of four European companies should use cloud computing services, big data and artificial intelligence, and at least 90% of SMEs should reach at least a basic level of digital intensity. The progress towards the target numbers will be measured by key performance indicators based on the DESI index.

1.5 Useful links and further reading

Cognizant glossary of digital terms

Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme

Digital Economy and Society Index (DESI)

Digital Transformation Framework

European Digital Innovation Hubs Network (EDIHs)

Europe's Digital Decade: digital targets for 2030

What is digital transformation? Your top questions answered.

---

[11] Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme.

[12] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

Co-funded by
the European Union

2 Modern technologies for SMEs

2.1 Modern technologies A-Z

The following definitions provide a brief overview of some of the key concepts and technologies in the modern IT landscape. The IT field is rapidly evolving, so staying updated on these technologies is crucial for SMEs.

Artificial intelligence (AI), is a term used to describe computers' aptitude to mimic human abilities such as reasoning, knowledge representation, planning, learning, natural language processing, perception, robotics, social intelligence and general intelligence.

Augmented Reality (AR) uses a device placed between the person and their environment to provide an enhanced version of their surroundings by providing virtual elements in the field of vision.

Big data is a label that typically applies to extremely large and/or unstructured data sets. Many organizations have little differentiation between their approach to big data and to traditional data sets.

Blockchain is a decentralized and distributed digital ledger technology that records transactions across multiple computers. It ensures transparency, security, and immutability of data and is commonly associated with cryptocurrencies like Bitcoin.

Cybersecurity involves protecting computer systems, networks, and data from theft, damage, or unauthorized access. It includes measures like firewalls, encryption, multi-factor authentication, and security protocols.

Internet of Things (IoT) is the network of physical devices, vehicles, appliances, and other objects embedded with sensors, software, and connectivity, enabling them to collect and exchange data. It aims to create smart and interconnected environments.

Machine Learning is a subset of AI that involves training computer systems to learn from data and improve their performance over time without being explicitly programmed. It includes techniques like neural networks, decision trees, and clustering.

Virtual reality (VR) is using computer-simulated three-dimensional environments to provide the user with an immersive and interactive experience.[13]

---

[13] https://www.comptia.org/content/guide/information-technology-terminology

Co-funded by
the European Union

2.2 Importance for entrepreneurs

Using modern IT technologies can provide numerous benefits for SMEs, helping them enhance their operations, competitiveness, and growth potential. Some key benefits of incorporating modern IT technologies into SMEs include:

- **Efficiency and productivity**: IT technologies such as automation, workflow management software, and cloud-based tools help streamline processes, reduce manual tasks, and enhance overall operational efficiency.
- **Cost savings:** Cloud computing and virtualization enable SMEs to access advanced IT capabilities without the need for significant upfront investments in hardware and infrastructure. This leads to cost savings and predictable operational expenses.
- **Global presence:** The internet and digital platforms allow SMEs to reach customers beyond their local markets, expanding their reach and potentially increasing revenue.
- **Data management and analysis:** IT technologies enable SMEs to collect, store, and analyse large volumes of data. This data-driven approach can lead to better decision-making, improved customer understanding, and the identification of growth opportunities.
- **Improved customer engagement**: CRM (Customer Relationship Management) software and digital communication channels enable SMEs to engage with customers more effectively, providing personalized experiences and enhancing customer satisfaction.
- **Remote work and collaboration:** IT technologies support remote work arrangements and virtual collaboration, allowing SMEs to access a global talent pool and work efficiently across geographic boundaries.
- **Cybersecurity:** IT security solutions help protect SMEs from cyber threats and data breaches, ensuring the safety of sensitive information and maintaining customer trust.

2.3 Process and requirements of implementing modern technologies to empower businesses

Preparing your SME for the implementation of modern technological solutions involves strategic planning and execution. The following five steps can help the preparation process:

Co-funded by
the European Union

1. Define objectives and use cases

Clearly outline your objectives for implementing modern technological solutions. Identify specific areas in your business where these technologies can add value, such as customer service improvement, training enhancement, or process optimization.

2. Assess technical readiness

Evaluate your current technical infrastructure to ensure it can support modern technological solutions. Determine whether you have the necessary hardware, software, and network capabilities to implement and maintain these technologies.

3. Allocate resources

Budget for the implementation of modern technological solutions. Consider costs for technology acquisition, software development, training and ongoing maintenance. Allocate financial and human resources accordingly.

4. Select the right technology and partners

Choose the appropriate technology that aligns with your objectives. Research and select reliable vendors or partners who can provide the necessary hardware, software, and expertise.

5. Pilot Testing and Training

Start with a small-scale pilot project to test the chosen modern technological solution. Gather a pilot team to participate in the testing, provide feedback, and identify any challenges. Train your team on how to use the technology effectively.

2.4 Types of solutions available for enterprises

Implementing small-scale pilot projects involving modern technologies can be a great way for SMEs to explore the potential benefits before making larger commitments. The following small-scale pilot project ideas can inspire SMEs to try new technologies.

AI	AR/VR
✓ **Chatbot for Customer Support** Implement a chatbot on your website or messaging platform to handle common customer inquiries. Test its ability to provide accurate and timely responses, freeing up your customer support team's time.	✓ **AR Product Catalogue** Develop an AR app that allows customers to scan product images in a physical catalogue or on your website. This brings products to life in a virtual 3D space, enhancing their shopping experience.

**Co-funded by
the European Union**

✓ **Sales Forecasting with Predictive Analytics**
Use historical sales data to build a predictive analytics model. Test its accuracy in forecasting sales for a specific product or time period, helping you optimize inventory management and resource allocation.

✓ **Personalized Email Marketing Campaign**
Segment your email list and create personalized email content based on customer preferences and behaviour. Test whether these personalized emails lead to higher open rates, click-through rates, and conversions.

✓ **Virtual Training Simulation**
Create a VR training simulation for a specific task or process relevant to your industry. Test the effectiveness of VR training in enhancing employee skills and knowledge retention.

✓ **AR Interactive Marketing**
Launch an AR marketing campaign where customers can scan promotional materials with their smartphones to access interactive content, such as videos, games, or special offers.

Big Data

✓ **Customer Segmentation & Personalization**
Analyse your customer data to segment your audience based on demographics, behaviours, and preferences. Tailor marketing campaigns and offers to each segment to test whether personalized strategies lead to increased engagement and conversions.

✓ **Demand Forecasting**
Utilize historical sales data to build a demand forecasting model for a specific product or service. Test the accuracy of predictions to optimize inventory levels and supply chain management.

✓ **Social Media Analytics**
Gather and analyse social media data related to your brand or industry. Test whether insights from social media analytics can inform your marketing strategies and customer engagement efforts.

Cybersecurity

✓ **Employee Security Training**
Develop a cybersecurity training program for your employees. Test its effectiveness by educating them about phishing scams, password best practices, and overall cybersecurity awareness.

✓ **Multi-Factor Authentication Implementation**
Introduce Multi-Factor Authentication (MFA) for accessing sensitive systems or accounts. Test the implementation with a small group of employees to evaluate its impact on enhancing account security.

✓ **Vulnerability Assessment**
Conduct a vulnerability assessment of your network and systems. Test for common vulnerabilities and assess the effectiveness of your current security measures in identifying and addressing them.

Table 1: small-scale pilot project ideas for SME.

2.5 Useful links and further reading

Artificial Intelligence: The Future of Digital Transformation is Here
Big data is better data
Excellence and trust in artificial intelligence
How humans and AI can work together to create better businesses
How the blockchain is changing money and business
How to Implement AR/VR Solutions: Use Cases for Your Industry (7 Industries with Examples)
The basics of AI for business

3 Knowledge Management and Tools

3.1 Definition of knowledge management

Knowledge management (KM) is the systematic management of knowledge and information within an organisation. It includes the identification, organisation, analysis and storage of information. Knowledge management makes knowledge accumulated within an organisation easily accessible and contribute to streamlining organisational processes[14].

3.2 Importance for entrepreneurs

Effective knowledge management for an enterprise will contribute to enhanced business performance, consequently it is crucial for all organisations. Knowledge management systems will definitely improve work performance by contributing to the following[15] :

- **improved decision-making processes:** faster and better decision making, it also ensures that all employees within the organisation are aware of the company's goals and work towards the same objectives,
- **better skills identification:** skills and competency gaps within the company are easily identified and can be faster reacted to,
- **maintaining knowledge:** knowledge management systems contribute to maintaining knowledge on a long run built up within the enterprise and make sure that information is available for a wider circle of employees,
- **better communication:** knowledge management systems contribute to better communication towards and with employees and ease collaboration for the team members. They also make idea and feedback generation easier and more straightforward.
- **increased data security:** with the knowledge management systems it is possible to control or provide access to information for the selected team members who will then be equipped with the right amount of information necessary for their work. So it not only ensures safe access to knowledge stored within the company, but also contributes to better performance and efficiency of the team members.

---

[14] https://www.getguru.com/reference/what-is-knowledge-management
[15] Ibid.

Co-funded by
the European Union

3.3 Knowledge management process

Knowledge management processes should be integrated into existing and future business processes at the right time. The key components of the implementation process can be described in five steps[16]:

1. Discover: the first step of the process is defining already existing or new knowledge or information and aligning them with the goals of the company. The process includes checking already existing data, separating irrelevant information from necessary one, or creating new one. Knowledge discovery is advised to be done at three different levels
    a. individual level: e.g. know-how of employees, information recorded manually
    b. group level: e.g. methods and networks used, practical information used by a group of people working together,
    c. organisational level: e.g. the company's mission, values, culture and business processes

2. Capture: the next step is to collect the knowledge defined through the discovery phase. Information is to be collected internally and externally, and should include the examination of explicit knowledge (already articulated, stored and shared), implicit knowledge (acquired through the different processes and routines of the company), and tacit knowledge (lessons learned and experience gained).

3. Organise: once the relevant knowledge is collected, it has to be organised in a way that in the future it can be easily accessed, understood, used, retrieved and shared by the employees working with it. Knowledge management systems are used at this point of the process.

4. Assess: the information compiled this way has to be double checked and validated before making it public. Information assessment means filtering out incorrect or redundant pieces of information.

5. Distribute: making the knowledge public will result in enhanced communication and cooperation between team members. A good knowledge management system is easy to use, share and maintain and allows access only to restricted groups.

---

[16] https://tettra.com/article/knowledge-management-process-101/

3.4 Knowledge management maturity levels

Knowledge management systems are often introduced at companies following the results of different maturity assessments and models. Although opinions differ on the usefulness and necessity of such models, they are helpful tools for identifying the organisation's level of knowledge management, its challenges and opportunities.

One example: APQC, a leading authority in benchmarking, process and performance improvement and knowledge management, defines 5 levels of knowledge maturity[17]:

1. Initiate: basic level of maturity, lacking consistent processes and practices, characterised by random and informal knowledge sharing,

2. Develop: phase of establishing a knowledge management strategy which is linked to the organisation's strategic goals,

3. Standardize: managing the knowledge management strategy, embedding the knowledge management approaches into the daily workflow,

4. Optimize: expansion of knowledge management initiatives throughout the organisation, continuous communication of the strategies to a wider circle within the organisation,

5. Innovate: embedding the standard knowledge management methodologies in the business model, monitoring its functioning and make steps for improvement, if necessary.
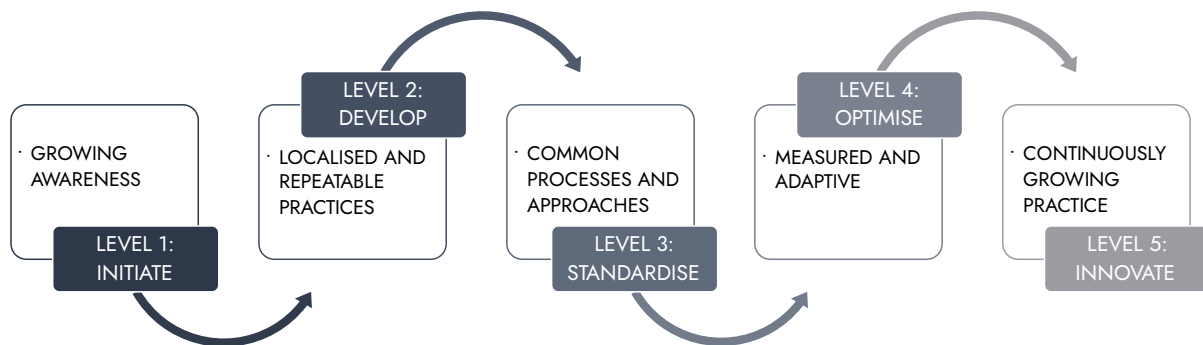

Figure 1: Five Levels of Knowledge Maturity; *Source: APQC's Levels of Knowledge Management Maturity.*

---

[17] https://www.apqc.org/system/files/resource-file/2019-11/K06126_APQC%27s%20Levels%20of%20KM%20Maturity%202019_0.pdf

3.5 Types of knowledge management tools

Some knowledge management tool types enterprises need to incorporate in order to streamline their business processes include the following[18]:

Knowledge base: A knowledge base is a freely accessible library of information where the end users can search information e.g. on the company, its product and service, or a certain topic. It is basically the final step of the knowledge management process when the data gathered is made available to the end user. With a self-service knowledge base the clients can resolve their queries on their own. It can include frequently asked questions, guides, description of processes and instructions for troubleshooting.

Learning management systems (LMS): Learning management systems are platforms designed for managing trainings or educational programmes. They can be software applications, but primarily they are web based and deliver online learning possibilities, or are used to combine different learning methods. With the use of LMS, enterprises can easily manage their workforce trainings.

Customer Relationship Management (CRM) Systems: CRM systems are a set of different applications to keep track of customer and client information, relationship and interaction. If customer data are collected systematically, businesses can analyse customer behaviour, react to customer needs more effectively and better market their products or services.

Content Management Systems (CMS): CMS platforms allow enterprises to create, manage and modify content of the company's website easily, without knowing any of the programming languages. They offer easy solutions to edit and manage content, offer different templates to choose from, allows collaboration for the management and modification of content and makes transportation of data problem-free.

3.6 Useful links and further reading

11 Absolutely Best Knowledge Management Tools for 2023 (Free & Paid)
Knowledge Management Maturity Models
The Complete Guide to Knowledge Management
What is knowledge management?

---

[18] https://www.getguru.com/reference/knowledge-management-tools

4 Workflow Management and Tools

4.1 Definition of workflow management

Workflow management is best described as a process for the creation, organisation and monitoring a set of any tasks which contribute to successful business management and thus enhanced productivity[19]. It is quite similar to, so it has to be distinguished from project management and business process management. *Workflow management*[20] is to be understood as the narrowest term, which is optimizing and streamlining particular task sequences. *Project management*[21] incorporates workflow management on a bigger scale: it is the planning and organisation of a company's tasks and resources to achieve project completion within a set timeframe and in line with the project's requirements. *Business process management*[22] refers to the discovery, modelling, analysis, measurement and optimalisation of business processes. The process is essential for the creation of a business strategy.

4.2 Importance for entrepreneurs

Efficiently managed workflows have multiple benefits. Cflow[23] collects 15 benefits for workflow automation, most of which can be used to describe the advantages of any workflow systems put in place at an enterprise:

- **Identification of inefficiencies**: with the help of workflow management systems, frequently occurring errors, delays, inconsistent processes and repetitions can be identified and eliminated.
- **Reducing costs:** Unnecessary steps that lengthen business processes contribute to loss of time and money. If the order of tasks is optimised with standardized processes, it will help getting the work done faster and in a more effective way. If the productivity of a team is enhanced, it will save cost for the company.
- **Increased visibility**: Streamlined workflows connect all parties concerned in delivering the task, establish a clear order of responsible parties, and make employees have a clear picture of who to turn to and with what questions. Using a workflow tool makes all the

---

[19] https://www.projectmanager.com/blog/what-is-workflow-management
[20] Ibid.
[21] Ibid.
[22] Ibid.
[23] https://www.cflowapps.com/undeniable-benefits-of-workflow-automation-for-your-business/

Co-funded by the European Union

tasks easily trackable and organised. Since the tasks are well delegated, everybody has a clear picture of the goals to be reached, and the necessary steps to be taken.

- **Improving communication and collaboration:** Streamlined workflows connect all parties concerned in delivering the task and define the communication channels to be used. Employees have a clear picture of who to turn to and with what questions. Clear communication will in all cases ease relations between the employees and result in better management procedures.

- **Increased productivity:** If workflow management systems become a practice built into the company culture, business operations are improved, resources can be better allocated, decision making is made easier. All in all, it contributes to overall business growth for a company.

4.3 Workflow management process

To create smooth and all-inclusive workflows, following the next steps are advised to be followed:[24]

1. **Identify:** collecting and identifying operating procedures to be inserted in the workflow and the people involved in the actual procedure. It is worth collecting all experience and information accumulated so far from people actually involved in the process.

2. **List the tasks:** get an understanding of the tasks to be performed. When structuring the workflow, linear, parallel, as well as conditional tasks (depending on the completion of another task) have to be considered.

3. **Find roles:** tasks follow each other automatically, or they are assigned to people with distinct responsibilities. All stakeholders for the different steps in the workflow have to be enlisted.

4. **Visualize:** workflow processes are best modelled and visualised by workflow diagrams. When setting up the visualisation of a workflow, consider the following logical order:
   - Defining the purpose of the diagram,
   - Gathering all necessary information (data, activities, steps to be taken),
   - Design the workflow process by using visual elements,
   - Analyse and optimize the end result.

5. **Test and optimise:** before putting in place, the workflow has to be tested in order to detect flaws in the process. Testing is best done with the involvement of the parties included in the workflow. Once their feedback is collected, the workflow can be optimised and is now ready to be tested real-time. All results will modify and further develop the workflow structure.

---

[24] https://kissflow.com/workflow/create-workflow-online-scratch/

Co-funded by
the European Union

4.4 Types of workflow management tools and software

Automated workflow management tools and software make the design of the workflow process easy. The Zapier report on the state of business automation concludes that 94% of workers perform repetitive and time-consuming tasks in their positions, 9 out of 10 found that automation has improved their lives at the workplace and 2 out of 3 people say that automation helped them become more productive[25]. Most of them are less stressed and would recommend automation to other workers.

Workflow management tools (software) have already defined templates or let users custom create their own templates. The workflow automation systems should be chosen in line with the specific task it will be used. Regardless of their functionality, their basic characteristic features include:[26]

- easy to use and build,
- cloud based,
- capable of integration with third party applications,
- flexible customization,
- easy visibility and security of data,
- mobile friendly.

Most commonly workflow management tools are used in the following fields[27]:

1. **Project management:** checking on work progress, assigning roles, planning and scheduling management, safe and easy access to project documentation, space for collaboration, customisable project templates;
2. **Sales and Marketing:** data management of customers, analytics, creating customized marketing content;
3. **Finance:** managing operations e.g. budget approvals, invoicing, orders, expense requests;
4. **Customer Service:** automatically interpreting incoming issues/problems, responding to customers (auto-replies to frequently asked questions), scheduling follow ups, etc.;
5. **Human Resource Management:** automated documentation submission, administrative tasks e.g. leave of absence, timesheets, surveys, performance reviews, onboarding and offboarding processes.

---

[25] https://zapier.com/blog/state-of-business-automation-2021/
[26] https://www.cflowapps.com/best-workflow-management-tools/
[27] https://www.cflowapps.com/best-workflow-management-tools/

Co-funded by
the European Union

4.5 Useful links and further reading

The 10 Best Workflow Management Software Reviewed
Workflow Management Basics: Workflow Components, Types and Best Practices
Workflow Management for Small Business
Workflow Management System Market Size, Share & Trends Analysis Report, 2023-2030

5 Enterprise Data Management and Tools

5.1 Definition of Enterprise Data Management

Although data is considered to be the new currency that fuel business operations, if not managed properly, enterprises will not be able to take advantage of is value. Businesses are facing an increasing pressure to implement Enterprise Data Management strategies. In a broad sense, Enterprise Data Management (EDM) is the process of inventorying and governing business data, which include integrating, governing, securing and disseminating data from various data streams[28]. EDM also means the transformation of corporate data into a smooth flow of information for further use. EDM processes let the information be shared with partners or customers in a secure way[29]. Enterprise data managers are most often database administrators, IT administrator or IT project managers.

5.2 Importance for entrepreneurs

The importance of Enterprise Data Management systems cannot be underestimated. The benefits most often include reduced risks, improved efficiency and customer service. According to Spiceworks, the most important benefits of Enterprise Data Management include the following[30]:

- Higher level of productivity: EDM systems make data easily accessible for employees working with it, this way increasing time efficiency and reducing the possibility of human errors. As more time can be spent on using data and not looking for it, the company experiences increased productivity

- Smoother workflows: as EDM systems allow smoother and more reliable workflows, and employees are able to respond to customers' needs in a quicker and more effective way.

---

[28] https://www.globalscape.com/blog/enterprise-data-management-what-you-need-know
[29] https://www.actian.com/what-is-enterprise-data-management/
[30] https://www.spiceworks.com/tech/big-data/articles/what-is-enterprise-data-management-edm-definition-importance-and-best-practices/#_003

Co-funded by
the European Union

- Decreased security risks: With the help of EDM system company data and sensitive information can be made secure and inaccessible for outsiders.
- Cost efficiency: if efficient EMD systems are put in place, incorrect client information, data duplication and incorrect data could be avoided.
- Reduced threat of data loss: EDM systems are designed to protect sensitive content and ensure that company data is secure and compliant under regulations.
- Improved decision-making processes: as all data come from a single and reliable source, decision makers can rely on accurate and up-to-date information and are able to make quicker and better business decisions.

5.3 Enterprise Data Management process and strategy

How one enterprise can develop its own EDM strategy and what concrete steps it has to take, depends on the actual state of its data management journey. Velvetech defines the following guideline to follow[31]:

1. **Assessment of the current situation**, which includes the examination of the data practices the organisation is following, defining the data is used, from what sources it arrives and which other sources could be used. This first step also includes the identification of the weak points.
2. **Definition of the current needs** and final objectives the organisation wants to reach. It is worth defining at this point what the priorities are, what kind of analytics are needed, how the data will be stored, who will be responsible for managing it, what KPIs are needed to reach success.
3. If the objectives are set, the **suitable tool has to be identified** to reach the planned goals. At this point the hardware and software infrastructure and requirements have to be examined. Decisions have to be made whether the development process is to be outsourced or handled by the internal IT team.
4. Once the **implementation of the data management solutions** is finished, extra focus should be put on monitoring and maintaining the tool to ensure its good performance.
5. **Data governance policies** have to be put in place with necessary standards and procedures which have to be followed by all parties within the organisation. These measures will ensure that the company does not experience any security issues or data loss.
6. As a last step, all relevant **staff of the organisation has to be trained** on the newly established data management strategy and the use of the new data management tool.

---

[31] https://www.velvetech.com/blog/enterprise-data-management-strategy/

Co-funded by
the European Union

5.4 Types of Enterprise Data Management Tools

The success of the data management of an enterprise largely depends on the tool used. As opposed to traditional data management tools which work on the clients' premises, modern data management tools are cloud based, which make them customizable and maintainable. Since different enterprises build different data management strategies, they require multiple tools for their objectives. Generally speaking, data management tools can be categorised according to the functions and objectives they serve[32], such as

- **Behavioural data management** tools are used to track user interaction of an organisation e.g. of websites,
- **Business intelligence data management** tools help transform data into business insights and with this they support business decisions,
- **Customer data management** tools provide information on user demographics and preferences and can be used to improve sales and marketing activities,
- **Data warehouse management** tools generate storage locations for the organisation's data,
- **Product analytics data management** tools provide information related to sales and focus on the production aspects of the data.

5.5 Digital ethics

The advancement of digital technology and the growing reliance on digital data oblige digital leaders to make ethics a priority in their business environment. Business leaders not only have to consider the productivity aims of the company, they also need to consider ethical concerns and find balance between these two imperatives[33]. Modern technologies, such as artificial intelligence, data analysis, process automation, which are increasingly used nowadays for example to improve customer experience, bring about questions of privacy rights. It is predicted that by 2024 annually more than 15 billion dollars will be spent on data protection and compliance technology[34]. As opposed to this, according to Deloitte annual report *State of Ethics and Trust in Technology*, most companies lack trustworthy and ethical principles specific to emerging new technologies[35].

---

[32] https://www.indeed.com/career-advice/career-development/data-management-tools
[33] https://digileaders.com/ethics-and-digital-transformation/
[34] https://www.gartner.com/en/newsroom/press-releases/2021-09-30-gartner-says-digital-ethics-is-at-the-peak-of-inflate
[35] https://www.prnewswire.com/news-releases/deloitte-survey-nearly-90-of-respondents-lack-ethical-guidelines-when-designing-and-using-emerging-technologies-301701462.html

Gartner defines *digital ethics* as the systems of values and moral principles to guide electronic interactions among people, organisations and things[36]. As collected in an article on ethical leadership[37], digital leaders should be prepared to

- perform ethical data stewardship and ensure that their organisation's data is created, used, stored, archived and deleted according to the defined data governance principles,
- support ethical artificial intelligence and automation procedures by ensuring that the new technology used is fair, accountable and transparent and by deliberately mitigating the risks of discrimination and unintended consequences,
- make sure to engage in partnerships/collaborations with stakeholders who share the same level of commitment to ethics concerning the development of digital technology.

According to Deloitte, Digital Ethics is not only about the legal use of data and technology, but also about their responsible management, which involves moral and conscious decision-making procedures[38]. Digital leaders must consider the compromises arisen by the responsible use of technology and are advised to take into account the following considerations when opting for the use of new technologies:

- how the customers and the public would react to using their data in return to get better products or services,
- whether all details of the new product would be freely discussed and made public,
- whether the product or service developers are aware of the ethical challenges,
- whether the data and algorithms are bias-free and would result in fair results.

Digital ethics is about building ethical considerations into the business strategy, procedures and behaviour and being prepared to account for any malfunctions in the system.

5.6 Useful links and further reading

30 questions to get your digital ethics governance right the first time
European data strategy: Making the EU a role model for a society empowered by data
Enterprise Data Management: Benefits, Elements, Strategy, Best Practices & Challenges
Deloitte. State of Ethics and Trust in Technology

---

[36] Ibid.

[37] https://www.linkedin.com/pulse/ethical-leadership-digital-age-navigating-challenges/

[38] https://www2.deloitte.com/content/dam/Deloitte/nl/Documents/risk/deloitte-nl-risk-digital-ethics-flyer.pdf

Co-funded by
the European Union

References

Ashatri, Hossein, *What Is Enterprise Data Management (EDM)? Definition, Importance, and Best Practices,* 2021, accessed 06 November, 2023, https://www.spiceworks.com/tech/big-data/articles/what-is-enterprise-data-management-edm-definition-importance-and-best-practices/#_003

Cook, Andy, 2023, *5 Steps of the Knowledge Management Process: How To Develop It,* accessed 06 November, 2023, https://tettra.com/article/knowledge-management-process-101/

Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme, 2022, OJ L 323

Deloitte Survey: Nearly 90% of Respondents Lack Ethical Guidelines When Designing and Using Emerging Technologies, 2022, PR Newswire website, accessed 06 November, 2023, https://www.prnewswire.com/news-releases/deloitte-survey-nearly-90-of-respondents-lack-ethical-guidelines-when-designing-and-using-emerging-technologies-301701462.html

Digital Ethics, Deloitte website, accessed 06 November, 2023, https://www2.deloitte.com/content/dam/Deloitte/nl/Documents/risk/deloitte-nl-risk-digital-ethics-flyer.pdf

Enterprise Data Management: What You Need to Know, 2022, Globalspace Technologies website, accessed 06 November, 2023, https://www.globalscape.com/blog/enterprise-data-management-what-you-need-know

Europe's Digital Decade: digital targets for 2023, accessed 06 November, 2023, https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

Fusaro, Francesco, 2023, *Digitization, digitalization and digital transformation explained — understanding differences incl. examples,* accessed 06 November, 2023, https://morethandigital.info/en/digitization-digitalization-and-digital-transformation-explained-understanding-differences-incl-examples/

Gartner Says Digital Ethics is at the Peak of Inflated Expectations in the 2021 Gartner Hype Cycle for Privacy, 2021, Gartner website, accessed 06 November, 2023, https://www.gartner.com/en/newsroom/press-releases/2021-09-30-gartner-says-digital-ethics-is-at-the-peak-of-inflate

How digitalised are the EU's enterprises?, European Commission Eurostat website, accessed 06 November, 2023, https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20220826-1

Co-funded by
the European Union

How to Create a Workflow Online From Scratch, 2023, Kissflow website, accessed 06 November, 2023, https://kissflow.com/workflow/create-workflow-online-scratch/

Hubert, Cindy and Lemons, Darcy, 2019, *APQC's Levels of Knowledge Management Maturity,* accessed 06 November, 2023, https://www.apqc.org/resource-library/resource-listing/apqcs-levels-knowledge-management-maturity

Indeed Editorial Team, 2023, *14 Data Management Tools To Implement in the Workplace,* accessed 06 November, 2023, https://www.indeed.com/career-advice/career-development/data-management-tools

IT Terminology – A Glossary of tech Terms for Beginners, CompTIA website, accessed 06 November, 2023, https://www.comptia.org/content/guide/information-technology-terminology#myself

Kariuki, Charles, Dr, 2023, *Ethical Leadership in the Digital Age: Navigating Challenges with Integrity*, accessed 06 November, 2023, https://www.linkedin.com/pulse/ethical-leadership-digital-age-navigating-challenges/

Key Elements of a Successful Enterprise Data Management Strategy, Velvetech website, accessed 06 November, 2023, https://www.velvetech.com/blog/enterprise-data-management-strategy/

Knowledge Management, Getguru website, accessed 06 November, 2023, https://www.getguru.com/reference/what-is-knowledge-management

Malsam, William, 2023, *Workflow Management Basics: Workflow Components, Types and Best Practices,* accessed 06 November, 2023, https://www.projectmanager.com/blog/what-is-workflow-management

Ochangco, Dani, 2019, *Ethics and Digital Transformation,* accessed 06 November, 2023, https://digileaders.com/ethics-and-digital-transformation/

Ovington, Tristan, 2023, *7 Key Digital Transformation Drivers in 2023,* accessed 06 November, 2023, https://www.walkme.com/blog/drivers-for-digital-transformation/

The Best Knowledge Management Tools to Use in 2023, Getguru website, accessed 06 November, 2023, https://www.getguru.com/reference/knowledge-management-tools

The Impact of Digital Technologies, United Nations website, accessed 06 November, 2023, https://www.un.org/en/un75/impact-digital-technologies

Top 5 Digital Transformation Trends for 2023, FDM website, accessed 06 November, 2023, https://www.fdmgroup.com/blog/digital-transformation-trends/

Technology in 2025: Prepare for the fourth industrial revolution, Pluralsight website, accessed 06 November, 2023, https://www.pluralsight.com/blog/career/tech-in-2025

What is Enterprise Data Management? Actian website, accessed 06 November, 2023, https://www.actian.com/what-is-enterprise-data-management/

Zapier Editorial Team, 2021, *Zapier report: The 2021 state of business automation,* Cflow website, accessed 06 November, 2023, https://zapier.com/blog/state-of-business-automation-2021/

15 Undeniable Benefits of Workflow Automation for Your Business, 2023, Cflow website, accessed 06 November, 2023, https://www.cflowapps.com/undeniable-benefits-of-workflow-automation-for-your-business/

18 Workflow Management Tools that You Must Consider for your Business, 2023, Cflow website, accessed 06 November, 2023, https://www.cflowapps.com/best-workflow-management-tools/

Co-funded by
the European Union