DALI Data Literacy Framework

Available in English, German, Spanish and Norwegian.

Data literacy is about the competences people need to engage with and use the data encountered in everyday life. It implies finding ways to make data informed decisions both in everyday life and in various contexts, according to personal or collective goals.

Data literacy includes understanding what data is and having an awareness and attitude towards non-neutrality/biased data (collection, etc.). It implies having the skills to collect, select, store, preserve and manage data; analyse, evaluate, interpret, critique, apply, use, and work with data; and represent, visualise, and communicate stories from data. It also encompasses having the competence to ask and answer questions from data sets through an inquiry process.

Furthermore, Data literacy means having the knowledge to critically make judgements and interrogate the claims accompanying data, including ethical and legal aspects that affect ones and other people's rights. It also includes the ability to use data as part of a design process, to solve problems, and to take decisions.

The DALI Data Literacy Framework describes the competences that characterise a data literate citizen. In particular, it specifies the knowledge & skills and the indicators of progressive levels of expertise (from basic to advanced) that can be addressed when developing courses, materials, or games for citizens.

The DALI Data Literacy Framework comprises three main elements:

(1) **Understanding Data**,

(2) **Acting on Data**

(3) **Engaging Through Data**

and a fourth transversal element (4) **Ethics & Privacy,** of which aspects can be found in each of the three main elements. Furthermore, it specifies the indicators of progressive levels of expertise for each of the three main components.
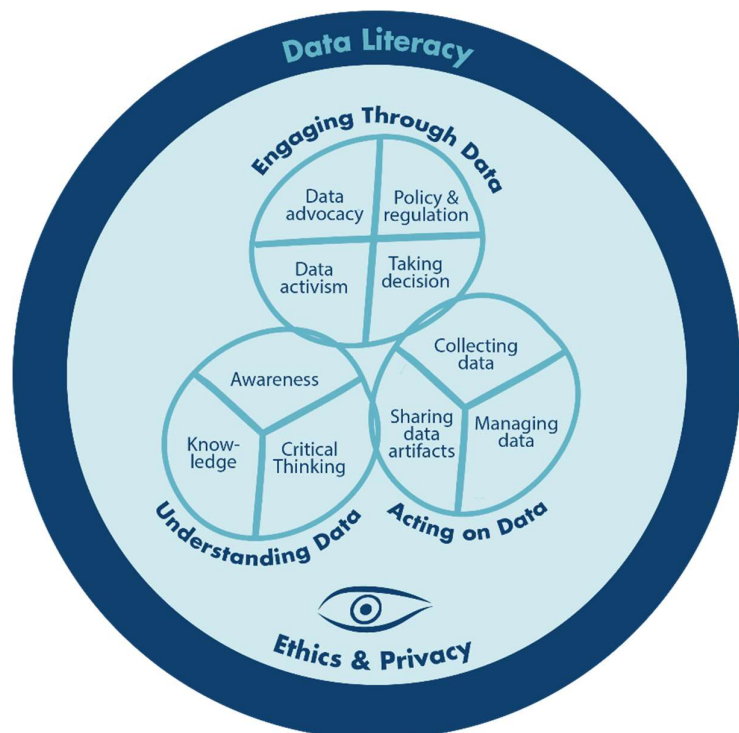
A data literate citizen is characterised by these competences related to data in everyday life. The DALI Data Literacy Framework was built based on a set of knowledge, skills and attitudes that were identified during a Delphi study. The following list of knowledge and skills can be drawn upon when developing courses, materials, or games in order to indicate which knowledge and skills citizens will develop through their use.

Understanding Data

This integrates three aspects of understanding data: Knowledge, Awareness & Critical Thinking.

Knowledge
Citizens will know:
- what data is, what form it takes and how it can be used in society (including personal data, institutional data, etc.)
- that data has different origins/sources (e.g., use of apps, tools, sensors, GPS), types (e.g., text data, audio data), and formats (e.g., MP4)
- how data can be collected from different environments/contexts
- there are technical/technological pre-conditions for data creation and use (e.g., how to connect devices, how to set device settings)
- that data is processed and manipulated by algorithms and apps
- that data is persistent and potentially stored
- the concept of data security
- the concept of data surveillance
- the concepts of big data and small data
- their data rights

Awareness
Citizens will be aware that:
- they generate data using apps, websites, driving their car, etc.
- there exists data about them in profiles (My Data)
- data is a representation of reality; it is not reality itself
- data is complex, and that there are variations in complexity of data
- there are potential and drawbacks of big data in different realms of society such as health, education, economics, security, etc.
- data is monetised (e.g., "data as the new oil")
- there are trade-offs when sharing your data (e.g., using social media provides data for data surveillance)

Critical thinking
Citizens will be able to carry out critical thinking about:
- the relationship between humans and data: the use automated processes vs human actions
- who is making the decision (the human or the algorithm)?
- how data tools work
- data being used for targeted advertisements
- the misrepresentation of data
- how data is monetised, for which purposes it is being collected

Acting on Data

Acting on data refers to the skills needed to take action on data. It has three sub-elements:

Collecting data
Citizens will have the skills to:
- configure privacy settings, revoke access, request to have their data erased
- use collected data to change their own behaviour (e.g., from a health app)
- make informed decisions when interacting with data-collecting actors (e.g. mobile apps, internet portals and employers)

Managing data
Citizens will have the skills to:
- organise data
- process, protect and store their own data (personal data management)
- move data from one application to another
- manipulate data
- evaluate the quality of data
- identify misrepresentation of data

Sharing data artefacts
Citizens will have the skills to:
- synthesise, visualise and represent data in different formats
- translate data into everyday language (e.g., tell a story about data)
- share their data through an open repository

Engaging Through Data

In this element, the ambition goes further; to take actions that affect individuals (I) and the world (the collective, C). Engaging Through Data has four sub-elements:

Policy and regulation
Citizens will have the knowledge and skills to:
- participate in data-based policy-making processes (C)
- interact with key stakeholders (e.g., data protection agencies) as needed for the resolution of issues related to data use (their own or other's data) (I & C)

Taking Decision
Citizens will have the knowledge and skills to:
- make their own decisions based on critical consideration of data (personal, professional, etc.) (I)
- understand the balance between individual and social benefits and the risks related to data use (I & C)
- be aware of their own role in acting on data from their different roles (professional, parent, citizen, etc.)

Data activism

Citizens will have the knowledge and skills to:

- use data as a basis or activism for data engagement (C)
- put their data rights into practice
- self-regulate their own data footprint

Data advocacy

Citizens will have the knowledge and skills to:

- communicate data meaning to stakeholders or to other peers (C)
- raise collective data awareness about the possibilities and challenges in data use (C)

Ethics & Privacy

An ethical perspective must underlie all the knowledge and skills and levels in the framework

DALI Data Literacy Framework Indicators

Element	Sub-elements	Level A	Level B	Level C
Understanding Data	Knowledge	What is data, how it is created	Where can you find data	What can you do with data. How can you engage through data.
	Awareness	Being aware; Knowing about the existence of data	Conceptualise & describe what data represents	Understand the implications of data
	Critical thinking	Knowing that data have a value; Knowing data can be used for multiple purposes	Being conscious of the way and reasons why your data is being used	Knowing ways to influence the use of your data; Knowing the way data can be used for collective purposes
Acting on Data	Collecting data	Use external devices or apps to collect data	Search & collect active data from repositories, apps and Internet portals	Create and store own data; Utilising specialised software for data collection and storage (databases)
	Managing data	Create, edit and store data in simple file formats (.txt or .xsl)	Manage data collected in apps and Internet portals	Manage data from diverse sources with specific software; Carry out complex operations with data (pivot tables, etc.)

Element	Sub-elements	Level A	Level B	Level C
	Sharing data artifacts	Share and communicate data sets that already exist under ethical considerations	Share data created by oneself in different formats (images, tables) using adequate repositories (open or ethically strong if it is needed)	Anonymise and/or Combine data sets (external and own creation) and share them in an open repository
Engaging Through Data	Policy and regulation	Understand how society shapes data use & influences policymaking	Apply policies and regulations to own data activity	Have a say on policy
	Taking Decision	Understand civil action / individual potential to use data	Be involved in civil action / use data for making individual decisions	Make decisions based on data; Lead civil action
	Data activism	Understand data activism movements and how these can change stakeholder's use of data	Participate, sign, or approve data activism initiatives initiated by others	Impacting society: take part, initiate organise, or lead data activism
	Data advocacy	Understand your influence on peers or stakeholders; help them understand the potentials and applications of data	Raising collective awareness about using data	Actively advocate that peers and stakeholders enact change through the use of data

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