DAPHNE

Report on Data Journalism and Data Communication

Universidad de Alcalá
WP2



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Executive Summary (English)

This document presents the results of the research phase and the associated tools, in accordance with the methodology defined by UAH for guiding the development of Deliverable D2.1 – Report on Data Journalism and Data.

It begins with a desk research phase, where existing references, frameworks, and best practices are analysed to establish an initial competency profile. In fact, in Phase 1, project partners were asked to identify and introduce training programmes and courses related to Data Journalism and Data Communication (DJDC). Subsequently, all the skills and competences addressed within these educational and training programmes were extracted and analysed.

In the next step, the extracted skills were reviewed in detail and compared according to their operational, technical, analytical, and functional similarities. Since many competences referred to comparable abilities using different terminology, semantically related skills were harmonised and unified under common labels, referred to as Core Competences. This process contributed to reducing redundancy and establishing a more coherent competency framework for the DJDC profile.

Following this harmonisation process, the identified Core Competences were further organised into broader Competence Domains. The grouping process was based on criteria such as similarity of professional application, technical orientation, functional objectives, and role within data-driven communication workflows. In other words, competences that contributed to related activities, shared common methodological approaches, or belonged to similar professional practices were classified within the same domain.

As a result, the final framework provides a structured overview of the key competences required in the field of DJDC across Higher Education (HE), Vocational Education and Training (VET), and Labour Market perspectives. The framework not only highlights the interdisciplinary nature of the field, but also supports the identification of competency gaps, emerging skill needs, and potential directions for future curriculum and training development.

Details of the final results are available at https://zenodo.org/records/21376018.

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Resumen ejecutivo (Español)

Este documento presenta los resultados de la fase de investigación y las herramientas asociadas, de acuerdo con la metodología definida por la UAH para guiar el desarrollo del Entregable D2.1 – Informe sobre Periodismo de Datos y Datos.

Comienza con una fase de investigación documental, donde se analizan las referencias, los marcos y las mejores prácticas existentes para establecer un perfil de competencias inicial. De hecho, en la Fase 1, se pidió a los socios del proyecto que identificaran y presentaran programas de formación y cursos relacionados con el Periodismo de Datos y la Comunicación de Datos. Posteriormente, todas las habilidades y competencias abordadas dentro de estos programas educativos y de formación fueron extraídas y analizadas.

En el siguiente paso, las habilidades extraídas se revisaron en detalle y se compararon en función de sus similitudes operativas, técnicas, analíticas y funcionales. Dado que muchas competencias se referían a habilidades comparables utilizando diferente terminología, las habilidades relacionadas semánticamente se armonizaron y unificaron bajo etiquetas comunes, denominadas Competencias Básicas. Este proceso contribuyó a reducir la redundancia y a establecer un marco de competencias más coherente para el perfil del Periodismo de Datos y la Comunicación de Datos.

Tras este proceso de armonización, las Competencias Básicas identificadas se organizaron a su vez en Dominios de Competencia más amplios. El proceso de agrupación se basó en criterios como análisis de la similitud, la orientación técnica, los objetivos funcionales y el papel dentro de los flujos de trabajo de comunicación basados en datos. En otras palabras, las competencias que contribuían a actividades relacionadas, compartían enfoques metodológicos comunes o pertenecían a prácticas profesionales similares se clasificaron dentro del mismo dominio.

Como resultado, el marco final proporciona una visión general estructurada de las competencias clave requeridas en el campo del Periodismo de Datos y la Comunicación de Datos desde las perspectivas de la Educación Superior (HE, por sus siglas en inglés), la Educación y Formación Profesional (VET) y el Mercado Laboral. El marco no solo destaca la naturaleza interdisciplinaria del campo, sino que también respalda la identificación de brechas de competencias, necesidades de habilidades emergentes y posibles direcciones para el desarrollo futuro de planes de estudios y formación.

Los detalles de los resultados finales están disponibles en inglés en:
https://zenodo.org/records/21376018.

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Sintesi Esecutiva (Italiano)

Questo documento presenta i risultati della fase di ricerca e gli strumenti associati, in conformità con la metodologia definita dall'UAH per guidare lo sviluppo del Deliverable D2.1 – Rapporto sul Data Journalism e sui Dati.

Inizia con una fase di ricerca documentale, in cui vengono analizzati i riferimenti, i framework e le migliori pratiche esistenti per stabilire un profilo di competenze iniziale. Infatti, nella Fase 1, è stato chiesto ai partner del progetto di identificare e presentare programmi di formazione e corsi relativi al Data Journalism e alla Comunicazione dei Dati. Successivamente, sono state estratte e analizzate tutte le abilità e le competenze affrontate all'interno di questi programmi educativi e di formazione.

Nel passaggio successivo, le abilità estratte sono state riviste in dettaglio e confrontate in base alle loro somiglianze operative, tecniche, analitiche e funzionali. Poiché molte competenze si riferivano ad abilità paragonabili utilizzando terminologie diverse, le abilità semanticamente correlate sono state armonizzate e unificate sotto etichette comuni, definite "*Competenze Fondamentali"*. Questo processo ha contribuito a ridurre la ridondanza e a stabilire un quadro di competenze più coerente per il profilo del Data Journalism e della Comunicazione dei Dati.

A seguito di questo processo di armonizzazione, le Competenze Fondamentali identificate sono state ulteriormente organizzate in Domini di Competenza più ampi. Il processo di raggruppamento si è basato su criteri quali la somiglianza dell'applicazione professionale, l'orientamento tecnico, gli obiettivi funzionali e il ruolo all'interno dei flussi di lavoro di comunicazione basati sui dati. In altre parole, le competenze che contribuivano ad attività correlate, condividevano approcci metodologici comuni o appartenevano a pratiche professionali simili sono state classificate all'interno dello stesso dominio.

Di conseguenza, il framework finale fornisce una panoramica strutturata delle competenze chiave richieste nel campo del Data Journalism e della Comunicazione dei Dati dalle prospettive dell'Istruzione Superiore (HE), dell'Istruzione e Formazione Professionale (VET) e del Mercato del Lavoro. Il framework non solo evidenzia la natura interdisciplinare del settore, ma supporta anche l'identificazione di lacune nelle competenze, necessità di abilità emergenti e potenziali direzioni per lo sviluppo futuro dei curricula e della formazione.

I dettagli dei risultati finali sono disponibili su https://zenodo.org/records/21376018.

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Resumo Executivo (Português)

Este documento apresenta os resultados da fase de investigação e as ferramentas associadas, de acordo com a metodologia definida pela UAH para orientar o desenvolvimento do Entregável D2.1 – Relatório sobre Jornalismo de Dados e Dados.

Inicia-se com uma fase de investigação documental, na qual as referências, estruturas e melhores práticas existentes são analisadas para estabelecer um perfil inicial de competências. De facto, na Fase 1, foi solicitado aos parceiros do projeto que identificassem e apresentassem programas de formação e cursos relacionados ao Jornalismo de Dados e à Comunicação de Dados. Posteriormente, todas as competências e aptidões abordadas nesses programas educativos e de formação foram extraídas e analisadas.

Na etapa seguinte, as competências extraídas foram analisadas detalhadamente e comparadas de acordo com suas similaridades operacionais, técnicas, analíticas e funcionais. Uma vez que muitas competências se referiam a capacidades comparáveis utilizando terminologia diferente, as habilidades semanticamente relacionadas foram harmonizadas e unificadas sob rótulos comuns, denominados Competências Essenciais. Este processo contribuiu para reduzir a redundância e estabelecer um quadro de competências mais coerente para o perfil de Jornalismo de Dados e Comunicação de Dados.

Após esse processo de harmonização, as Competências Essenciais identificadas foram organizadas em Domínios de Competência mais amplos. O processo de agrupamento baseou-se em critérios como similaridade de aplicação profissional, orientação técnica, objetivos funcionais e papel dentro dos fluxos de trabalho de comunicação baseados em dados. Em outras palavras, as competências que contribuíam para atividades relacionadas, compartilhavam abordagens metodológicas comuns ou pertenciam a práticas profissionais semelhantes foram classificadas no mesmo domínio.

Como resultado, a estrutura final apresenta uma visão geral estruturada das principais competências necessárias na área do Jornalismo de Dados e da Comunicação de Dados a partir das perspetivas do Ensino Superior (ES), Ensino e Formação Profissional (EFP) e Mercado de Trabalho. A estrutura não apenas destaca a natureza interdisciplinar da área, mas também apoia a identificação de lacunas de competências, necessidades de habilidades emergentes e direções potenciais para o futuro desenvolvimento de currículos e programas de formação.

Os detalhes dos resultados finais estão disponíveis em https://zenodo.org/records/21376018.

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Σύνοψη (Ελληνικά)

Αυτό το έγγραφο παρουσιάζει τα αποτελέσματα της φάσης έρευνας και τα σχετικά εργαλεία, σύμφωνα με τη μεθοδολογία που καθορίστηκε από το UAH για την καθοδήγηση της ανάπτυξης του Παραδοτέου D2.1 – Έκθεση για τη Δημοσιογραφία Δεδομένων και τα Δεδομένα.

Ξεκινά με μια φάση έρευνας γραφείου (desk research), όπου αναλύονται οι υπάρχουσες αναφορές, τα πλαίσια και οι βέλτιστες πρακτικές για τη δημιουργία ενός αρχικού προφίλ ικανοτήτων. Στην πραγματικότητα, στη Φάση 1, ζητήθηκε από τους εταίρους του έργου να εντοπίσουν και να παρουσιάσουν εκπαιδευτικά προγράμματα και μαθήματα σχετικά με τη Δημοσιογραφία Δεδομένων και την Επικοινωνία Δεδομένων. Στη συνέχεια, όλες οι δεξιότητες και οι ικανότητες που εξετάζονται σε αυτά τα εκπαιδευτικά και καταρτιστικά προγράμματα εξήχθησαν και αναλύθηκαν.

Στο επόμενο βήμα, οι δεξιότητες που εξήχθησαν εξετάστηκαν λεπτομερώς και συγκρίθηκαν σύμφωνα με τις επιχειρησιακές, τεχνικές, αναλυτικές και λειτουργικές ομοιότητές τους. Δεδομένου ότι πολλές ικανότητες αναφέρονταν σε συγκρίσιμες δεξιότητες χρησιμοποιώντας διαφορετική ορολογία, οι σημασιολογικά σχετικές δεξιότητες εναρμονίστηκαν και ενοποιήθηκαν κάτω από κοινές ετικέτες, οι οποίες ονομάζονται Βασικές Ικανότητες. Αυτή η διαδικασία συνέβαλε στη μείωση του πλεονασμού και στη δημιουργία ενός πιο συνεκτικού πλαισίου ικανοτήτων για το προφίλ της Δημοσιογραφίας Δεδομένων και της Επικοινωνίας Δεδομένων.

Μετά από αυτήν τη διαδικασία εναρμόνισης, οι προσδιορισμένες Βασικές Ικανότητες οργανώθηκαν περαιτέρω σε ευρύτερους Τομείς Ικανοτήτων. Η διαδικασία ομαδοποίησης βασίστηκε σε κριτήρια όπως η ομοιότητα της επαγγελματικής εφαρμογής, ο τεχνικός προσανατολισμός, οι λειτουργικοί στόχοι και ο ρόλος στις ροές εργασίας της επικοινωνίας που βασίζεται στα δεδομένα. Με άλλα λόγια, οι ικανότητες που συνέβαλαν σε σχετικές δραστηριότητες, μοιράζονταν κοινές μεθοδολογικές προσεγγίσεις ή ανήκαν σε παρόμοιες επαγγελματικές πρακτικές ταξινομήθηκαν στον ίδιο τομέα.

Ως αποτέλεσμα, το τελικό πλαίσιο παρέχει μια δομημένη επισκόπηση των βασικών ικανοτήτων που απαιτούνται στον τομέα της Δημοσιογραφίας Δεδομένων και της Επικοινωνίας Δεδομένων μέσα από τις προοπτικές της Τριτοβάθμιας Εκπαίδευσης (ΗΕ), της Επαγγελματικής Εκπαίδευσης και Κατάρτισης (VET) και της Αγοράς Εργασίας. Το πλαίσιο δεν υπογραμμίζει μόνο τη διεπιστημονική φύση του τομέα, αλλά υποστηρίζει επίσης τον εντοπισμό κενών σε ικανότητες, αναδυόμενων αναγκών για δεξιότητες και πιθανών κατευθύνσεων για τη μελλοντική ανάπτυξη προγραμμάτων σπουδών και κατάρτισης.

Λεπτομέρειες για τα τελικά αποτελέσματα είναι διαθέσιμες στο https://zenodo.org/records/21376018.

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Abbreviations

DJDC: Data Journalism and Data Communication

WP: Work Package

AI: Artificial Intelligence

Cedefop: European Centre for the Development of Vocational Training

ESCO: European Skills, Competences, Qualifications and Occupations

EU: European Union

EURES: European Employment Services

GA: Grant Agreement

GDPR: General Data Protection Regulation

HE: Higher Education

HEI: Higher Education Institution

ICT: Information and Communication Technology

ISCED: International Standard Classification of Education

ISCO: International Standard Classification of Occupations

LLM: Large Language Model

NLP: Natural Language Processing

NGO: Non-Governmental Organization

OJA: Online Job Advertisement

OVATE: Online Vacancy Analysis Tool for Europe

VET: Vocational Education and Training

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1. Introduction

This section provides an overview of the general context of the project and the role of Work Package 2 (WP2) within the DAPHnE framework. In particular, it presents the Context of the Project, the Project Objectives Allocated to WP2, and the Main Sub-tasks of WP2.

1.1 Context of the Project

The rapid expansion of digital data across all sectors of society has significantly transformed the fields of journalism, media production, and professional communication. In recent years, Data Journalism and Data Communication (DJDC) have emerged as strategic domains within European higher education and professional training, driven by the increasing demand for evidence-based storytelling, data interpretation, and digital communication practices. While many media organizations have established specialized units dedicated to data journalism, higher education institutions and professional training systems still face difficulties in preparing professionals who possess the interdisciplinary, scientific, and systematic competencies required to work effectively in data-driven and AI-enhanced communication environments.

In response to this challenge, the DAPHnE Project has been designed to strengthen multidisciplinary cooperation between higher education institutions, vocational training providers, and professional stakeholders to foster innovation in teaching and learning within the fields of DJDC. The project addresses current educational gaps by promoting knowledge exchange and by developing flexible learning pathways that combine academic rigor, professional applicability, and digital accessibility.

The project is structured around several complementary objectives. First, it aims to define a clear professional profile for Data Journalism and Communication by identifying the competencies, knowledge areas, and technical skills required in contemporary data-driven communication environments (WP2). Second, it seeks to develop modular and flexible educational units in the form of short learning modules (“learning pills”) that can be integrated into higher education programs and professional upskilling pathways (WP3). Third, the project introduces a qualification and competency assessment framework, including internationally recognized digital certification opportunities through University of Alcalá as an official ICDL testing centre (WP4).

In addition, the project provides open and accessible online education through MOOCs and digital learning resources hosted on a dedicated platform (WP5), pilots an advanced ISCED-7 educational pathway at master’s level (WP6) and adapts its modular content to vocational education through an ISCED-5 short-cycle VET program (WP7). These educational pathways will be validated through pilot implementations carried out within a collaborative academic-business ecosystem to ensure alignment with the needs of graduates, vocational learners, journalists, corporate communicators, and data-oriented professionals.

Within this broader framework, Work Package 2 (WP2), coordinated by University of Alcalá, represents a foundational phase in the development of the project results, as it establishes the empirical and conceptual basis for the subsequent educational design. WP2 is organized into three interconnected subtasks: (1) the development of the research protocol and associated methodological tools; (2) the implementation of needs analysis, collection of best practices, and construction of the competency framework; and (3) the synthesis of findings into the final research report.

All project partners contribute actively to WP2 by sharing institutional expertise and comparative data related to course organization, curriculum design, content structures, duration, and assessment practices in both European and non-European educational contexts.

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This collaborative research process aims to define sectoral needs, identify the competencies required for professional work with data in journalism and communication, and establish a robust evidence base for the design of two complementary curricula: one oriented toward graduate students and another tailored to professionals already active in the labour market, including journalists, corporate communicators, and communication specialists working in European enterprises and institutions.

Through this research-driven approach, WP2 ensures that the educational outputs of the project are grounded in real labour-market needs, pedagogical innovation, and international best practices, thereby contributing to the development of a new generation of professionals capable of producing meaningful, ethical, and data-centered communication in increasingly complex digital environments.

1.2 Project Objectives Allocated to WP2

As previously explained, the objectives can be summarized as follows:

- Defining the needs analysis.
- Identifying the competencies required for working with data in Journalism and Communication, including the Data Journalist profile and related skill set.
- Producing the WP2 report, which will serve as the foundation for designing the structure and format of the two curricula—one for graduate students, and one for professionals in the job market (traditional journalists, corporate communicators, and communication specialists in EU enterprises and institutions).

This WP is aligned with the following specific objective of the project:

- SO1: Research the core competencies of a data journalist professional profile and design common training course programs.

1.3 Main Sub-tasks of WP2

According to the approved GA, WP2 is structured into three complementary tasks that together guide the research phase from methodological preparation to evidence generation and reporting.

1.3.1 Task T2.1

'Development of the Protocol for the Research Phase and Related Tools (M3–M6)'

Task T2.1 marks the operational starting point of WP2 and focuses on establishing the common methodological framework for all subsequent research activities. The objective of this task is to ensure coherence across partner contributions by developing shared guidelines, templates, and instruments for both desk research and field research.

Under the coordination of University of Alcalá, an internal research protocol is developed and distributed among all project partners. This protocol includes five main components: (1) a template for desk research defining chapters, thematic areas, keywords, and examples of relevant good practices; (2) methodological guidelines and leading questions to support documentary analysis; (3) a structured online questionnaire addressed to project stakeholders; (4) interview scripts for expert consultations; and (5) a clear definition of partner responsibilities and expected contributions throughout the research process.

The protocol serves as the common operational reference for data collection in all participating countries and ensures methodological comparability across institutional contexts.

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1.3.2 Task T2.2

'Set up the Need Analysis and Best Practices (M3–M9)'

Task T2.2 focuses on conducting the empirical research phase and establishing the evidence base for the competency framework. This task aims to involve relevant stakeholders from the beginning of the project and to deepen the consortium's understanding of current practices, educational offers, and professional needs in the field of DJDC.

The need analysis combines two complementary research dimensions:

- Desk research, consisting of a structured literature review and documentary analysis on:
- existing higher education, vocational education, and private training courses related to data journalism and data communication;
- organizational models of these courses, including face-to-face, blended, and e-learning formats;
- competence assessment and validation approaches;
- professional competencies required for data journalists and related profiles;
- examples of innovative practices in data discovery, data visualization, and data storytelling.

Field research, consisting of online questionnaires and expert interviews conducted across partner countries.

The questionnaire is developed in multiple languages (Italian, Portuguese, Greek, and Spanish) to ensure accessibility and broad stakeholder participation. Academic and VET partners are responsible for collecting 60 responses from higher education students, VET learners, and educational professionals, while business partners collect 60 additional responses from journalists, communicators, and professionals working in European enterprises and institutions, resulting in a total target of 120 responses.

In parallel, each partner conducts expert interviews in the field of DJDC, with an expected minimum of 20 interviews across the consortium. These interviews provide qualitative insight into emerging professional requirements, pedagogical innovations, and labour-market expectations.

1.3.3 Task T2.3

'Analysis of the Results and Elaboration of the Report (M6–M9)'

Task T2.3 synthesizes all research outputs generated through Tasks T2.1 and T2.2 into a structured comparative report that will serve as the conceptual basis for subsequent project work packages.

At the first stage, academic partners — University of Rome Tor Vergata, NOVA University Lisbon, Aristotle University of Thessaloniki, and University of Alcalá — prepare national reports presenting country-level findings. Each national report has a maximum length of 30 pages and includes analysis of educational provision, competencies, and identified needs within the national context.

In the second stage, University of Alcalá conducts a comparative analysis of all national reports and consolidates the findings into the final WP2 deliverable entitled:

D2.1 Report on Data Journalism and Data Communication – including the definition of the Data Journalist profile and the related competence framework

D2.1 report is expected to be delivered in month 9. This report represents the principal research output of WP2 and forms the basis for:

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- the design of the DAPHnE curricula in subsequent work packages,
- the development of modular learning content,
- and the competence assessment framework under WP4.

According to the proposal, the report is structured into eight main sections:

1. Introduction (executive summary)
2. Methodology
3. Data Journalism and Data Communication across the EU (and beyond)
4. Competences of Data Journalism and Data Communication in higher education students
5. Competences for the labour market
6. Competences in vocational education and training
7. Final considerations
8. References

2. Methodology

This section presents the overall Release of the Research Protocol and Tools and implementation process adopted in Work Package 2 to achieve the defined research tasks and deliver the expected outputs of the DAPHnE Project.

To ensure a structured and evidence-based development of the competency framework and professional profile in DJDC, the research process is organized into three main phases:

- Phase 1: Desk Research
- Phase 2: Survey Analysis
- Phase 3: Interview Analysis

This phased methodological design enables a progressive refinement of the research outputs through iterative validation and stakeholder feedback. As illustrated in Figure 1, the output generated in each phase contributes directly to improving and refining the professional profile developed for roles in DJDC.

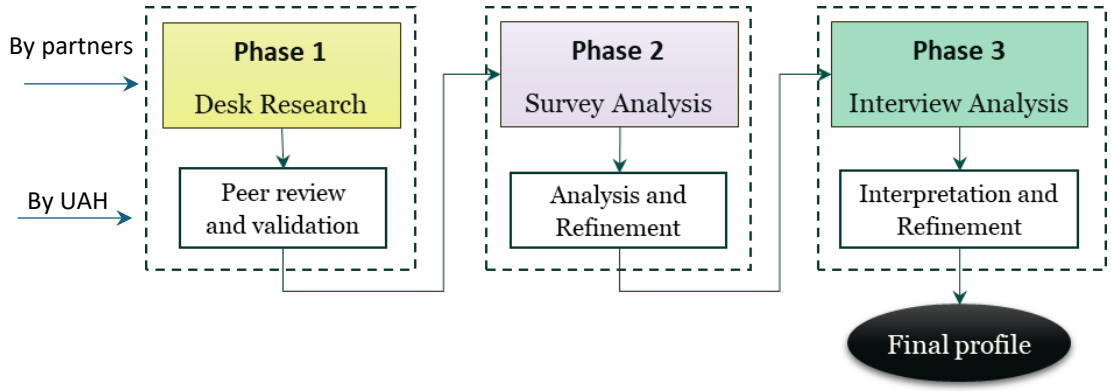


Figure 1 Main phases of the methodology

The research methodology follows a sequential, multi-phase workflow Figure 1 designed to progressively refine and validate the Data Journalism and Data Communication (DJDC) professional profile. Each phase builds directly upon the previous one: foundational insights gathered through desk research (Phase 1) inform the quantitative survey design (Phase 2), which is subsequently complemented by qualitative expert interviews (Phase 3). This iterative approach ensures that the consolidated profile reflects both academic evidence and real-world labour market expectations, establishing a robust framework for subsequent work packages.

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The following sections explain the specific objectives, implementation steps, and tools utilized in each phase in detail.

2.1 Phase 1: Desk Research

Phase 1 constitutes the initial analytical stage of WP2 and is designed to establish the preliminary competency basis for the definition of the DJDC professional profile. This phase is divided into two main components: the first is based on partners' contributions across the consortium, while the second is conducted by the University of Alcalá (UAH) research team. As illustrated in Figure 2, both components are complementary and together provide the first evidence-based version of the target occupational profile.

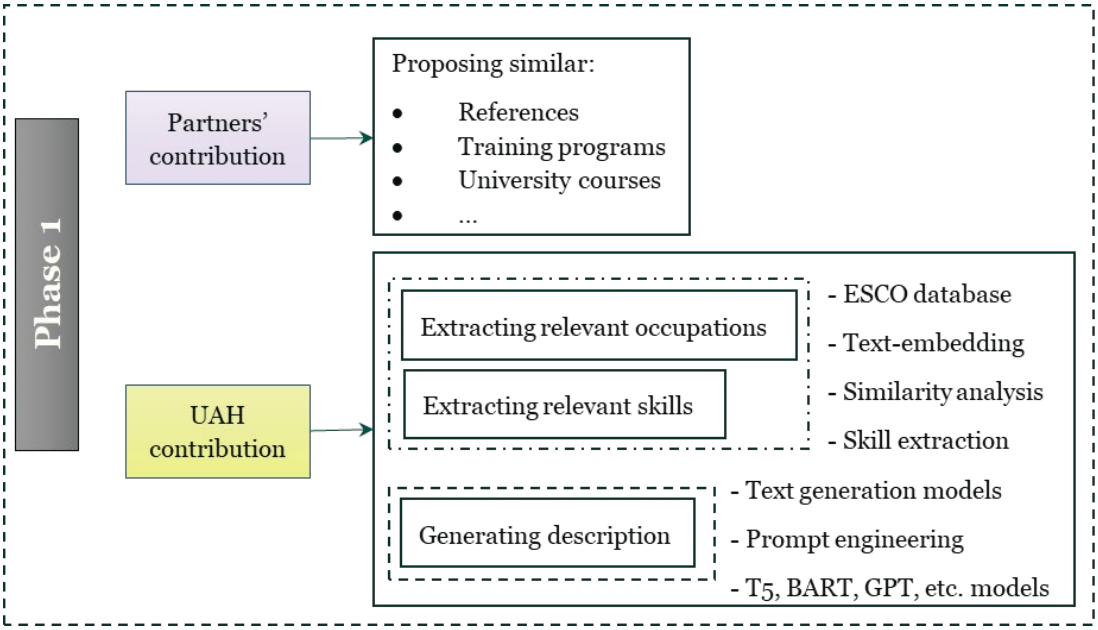


Figure 2 Details of Phase 1, Desk research

In the first component, all project partners are invited to contribute by identifying and sharing relevant materials associated with the target professional field. These contributions include occupational profiles, university courses, training programs, professional certifications, competence frameworks, and other educational or labour-market resources related to the Data Journalist professional profile and adjacent fields.

To ensure consistency in data collection, a structured spreadsheet template is prepared and distributed among all partners. This common template allows each institution to submit relevant examples according to a predefined format, including information such as title, source, country, educational level, competence focus, duration, target audience, and relevance to DJDC. The objective of this first component is to create a comparable repository of existing educational and professional references that can support the subsequent analytical work.

The second component is conducted by the UAH research team, composed of specialists in digital skills analysis, occupational profiling, competency frameworks, and data-driven educational modelling. In addition to using the material collected from partners, this phase applies advanced computational methods based on Natural Language Processing (NLP) and text mining to extract the relevant skills associated with the target occupational profile.

Given that the project proposal explicitly identifies ESCO as the main reference framework, the ESCO classification database is adopted as the primary structured source for occupational and skills analysis. ESCO provides a standardized European taxonomy of occupations, skills, and

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qualifications, making it particularly suitable for ensuring policy alignment and comparability across countries.

Using ESCO as the reference dataset, the analytical process begins with the extraction of occupations that are conceptually related to the target profile. Advanced NLP techniques are then employed to identify occupations within the ESCO database that show the highest conceptual proximity to the Data Journalist professional profile. This approach enables the identification of adjacent professional roles whose skill composition may contribute to a more robust definition of the target profile.

Once the most relevant occupations have been identified, the associated skills are extracted, compared, and consolidated to generate a preliminary competency list. In a further analytical step, text generation models are used to support the generation of a concise and coherent professional description for the target occupational profile.

The resulting outputs are then reviewed and validated by project partners and the UAH team to ensure conceptual consistency, practical relevance, and alignment with the project objectives. The main output of Phase 1 is therefore a preliminary list of skills and knowledge required for the DJDC professional profile, accompanied by a descriptive paragraph that defines the professional role in terms of tasks, skills, and competence orientation. This output constitutes the initial reference framework for the subsequent survey phase, where broader stakeholder validation will be conducted.

2.2 Phase 2: Survey Analysis

After the initial occupational profile has been developed in Phase 1 and validated by the project partners, the research process proceeds to **Phase 2: Survey Analysis**.

The main objective of this phase is to validate, assess, and further refine the preliminary DJDC role profile through direct feedback from relevant stakeholders. More specifically, the survey is designed to evaluate the relevance, completeness, and practical applicability of the skills identified in Phase 1, as well as the overall consistency of the proposed occupational description. This stage allows the consortium to collect quantitative evidence from a broader range of actors directly connected to the fields of journalism, communication, education, and digital transformation.

A minimum of **120 participants** is expected to take part in the survey. These participants include stakeholders, journalists, communication professionals, educational actors, and individuals with relevant experience in data-related communication environments.

The survey is developed using digital tools such as EUSurvey given its powerful features controlling the access evolution through online URL shortening and monitoring systems like bit.ly, allowing easy dissemination across partner institutions and countries. A first survey template is designed by the University of Alcalá research team and then shared with all project partners for peer review and final adaptation before distribution, including localisation.

To ensure accessibility and effective stakeholder participation across the consortium, the survey is prepared not only in English but also translated into Italian, Portuguese, Greek, and Spanish. This multilingual approach facilitates broader participation and improves the reliability of the collected responses in different national contexts. Local partners will translate into English the text answers to open questions to allow a homogeneous treatment of the information.

Each project partner is expected to contribute to data collection by obtaining responses from at least **20 participants** through its own institutional and professional networks. After local

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dissemination and collection, all partners share the resulting datasets with the University of Alcalá team for centralized analysis.

In accordance with the project proposal, the expected distribution of responses is structured as follows:

- Academic and VET partners collect a total of **60 responses** from higher education students, vocational education learners, and educational professionals.
- Business partners collect a total of **60 responses** from journalists, communication professionals, and communicators working in European enterprises and institutions.

This balanced structure ensures that the survey captures perspectives from both the educational sector and the labour market, thereby strengthening the relevance of the competency framework.

Following data collection, the University of Alcalá team conducts the analysis of survey results, focusing on identifying patterns of agreement, relevance ratings, missing competencies, and suggested improvements. Based on these findings, the preliminary occupational profile is revised and refined to improve its conceptual robustness and practical alignment with stakeholder expectations.

As illustrated in Figure 3, the survey collection process follows a coordinated cycle of questionnaire preparation, multilingual dissemination, partner-based collection, centralized aggregation, and analytical refinement.

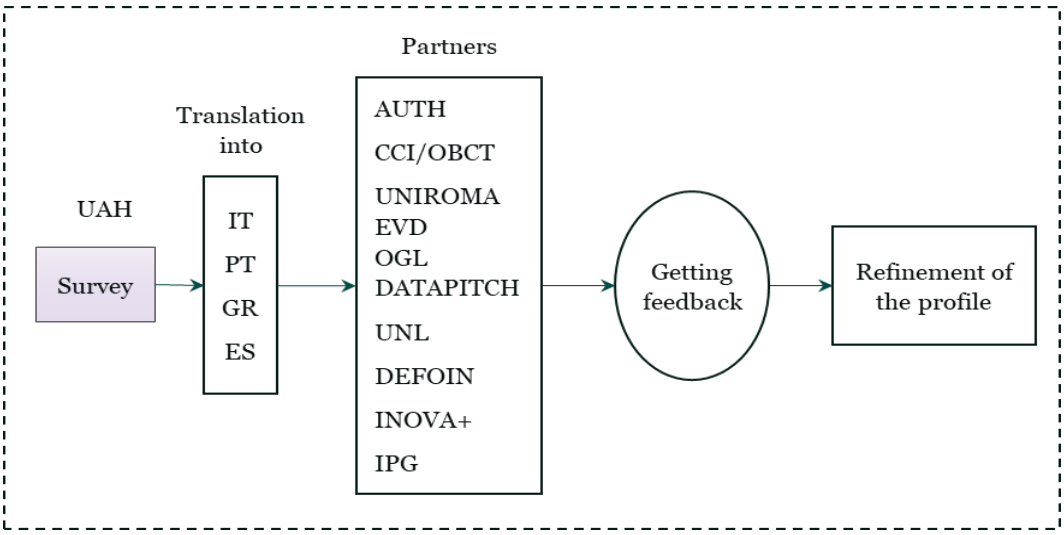


Figure 3 Details of Phase 2: Survey Analysis

The final output of this phase is an improved version of the competency profile, which serves as the main input for **Phase 3: Interview Analysis**, where qualitative expert validation is conducted.

2.3 Phase 3: Interview Analysis

The third phase of the methodology is dedicated to the design and implementation of a structured interview process with experts in the fields of DJDC. The main objective of this phase is to obtain qualitative feedback that supports the final validation of the competency framework and professional profile developed during the previous phases.

According to the project proposal, each project partner is expected to conduct interviews with specialists who have relevant academic, professional, or sectoral expertise in data journalism,

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digital communication, data storytelling, or related fields. Across the consortium, a minimum of **22 interviews** will be conducted in total. As illustrated in Figure 4, this phase represents the final validation step before the definition of the final occupational profile.

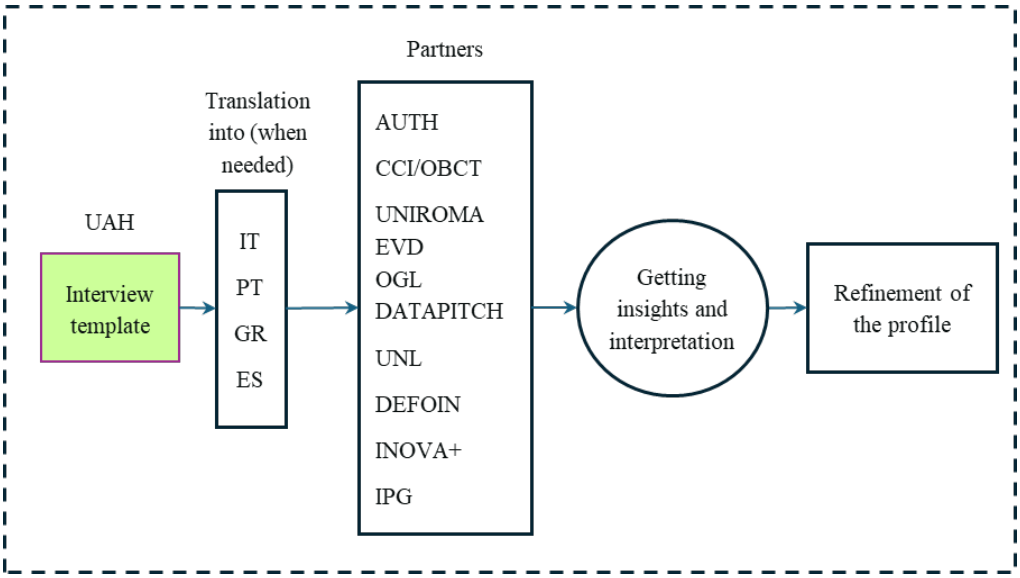


Figure 4 Details of Phase 3: Interview Analysis

A common interview framework, including the interview structure, thematic content, and guiding questions, is initially designed by the University of Alcalá team and then shared with the remaining project partners to ensure methodological consistency across countries. The interview protocol is developed in a semi-structured format with a protocol script, questions and template for registering information, allowing comparability of responses while also enabling experts to provide contextualized insights and additional observations based on their professional experience. The interviews can be organised in direct physical contact or through online calls and they will be not recorded but some evidence of the action is recommended (e.g., such as screenshots of the call). They can be organised in local language if the corresponding partner considers it recommendable but the resulting information will be provided in English.

Under normal implementation conditions, each partner is expected to conduct interviews with at least **two experts**, although additional interviews may be carried out depending on local availability and institutional networks. The interviews focus primarily on evaluating the occupational profile developed in Phases 1 and 2, with particular attention to the relevance of the identified competencies, the completeness of the skill framework, emerging labour-market trends, and future competency needs associated with data-driven communication environments. After completing the interviews, each partner shares the collected feedback and summary results with the University of Alcalá team for centralized qualitative analysis.

The final analytical stage consists of reviewing all interview feedback, identifying recurring observations, integrating expert recommendations, and assessing possible adjustments to the competency structure and occupational description. Based on this consolidated qualitative evidence, the University of Alcalá team performs the final evaluation and refinement of the proposed profile.

The output of this phase is the **final validated Data Journalist and Data Communication role profile**, including the consolidated list of competencies and the definitive occupational description, which will serve as the main reference for the curriculum design and competence assessment activities in subsequent work packages.

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2.4 Tasks Timetable

In addition to the methodological phases described above, it is necessary to establish a clear implementation schedule in order to support the coordination, distribution, and monitoring of the activities that will be carried out during the upcoming stages of WP2.

Given the collaborative nature of the research process and the involvement of multiple partners across different countries, a structured timeline is essential to ensure that each activity is completed within the planned timeframe and that dependencies between tasks are properly managed. The scheduling framework also facilitates coordination between data collection, analysis, validation, and reporting activities, while allowing sufficient time for feedback loops and refinement between phases.

For this purpose, a dedicated activity plan has been defined for each of the three methodological phases. These schedules specify the sequence of actions, partner responsibilities, expected outputs, and indicative deadlines associated with each phase of implementation.

Table 1 and Table 2 shows the implementation schedule of activities planned for Phase 1 (Desk Research), Phase 2 (Survey Analysis), and Phase 3 (Interview Analysis).

Table 1 WP2 timetable tasks (months)

Activity	Task	Date
Methodology document release (Methodology)	2.1	M5
Template preparation for Desk Research (Phase 1)	2.1	M5
Collection of the Desk Research results (Phase 1)	2.2	M5
Desk research data processing (Phase 1)	2.3	M6
Publication of the results and partners validation (Phase 1)	2.3	M6
Survey preparation and validation (Phase 2)	2.1	M6
Survey distribution (Phase 2)	2.2	M6
Analysis of the survey data and refinement of the profile (Phase 2)	2.3	M7
Publication of the results and partners validation (Phase 2)	2.3	M7
Interviews preparation and validation (Phase 3)	2.1	M7-M8
Interviews (Phase 3)	2.2	M8
Analysis of the interviews results and refinement of the profile (Phase 3)	2.3	M8
National report (Phase 3)	2.3	M8
D2.1 Report on Data Journalism and Data Communication release	2.3	M8

Table 2 WP2 timetable tasks (estimated dates)

Activity	Task	Date
Methodology document release (Methodology)	2.1	15 apr
Template preparation for Desk Research (Phase 1)	2.1	15 apr
Collection of the Desk Research results (Phase 1)	2.2	30 apr
Desk research data processing (Phase 1)	2.3	7 may
Publication of the results and partners validation (Phase 1)	2.3	14 may
Survey preparation and validation (Phase 2)	2.1	14 may
Survey distribution (Phase 2)	2.2	18 may
Analysis of the survey data and refinement of the profile (Phase 2)	2.3	12 jun
Publication of the results and partners validation (Phase 2)	2.3	19 jun
Interviews preparation and validation (Phase 3)	2.1	19 jun
Interviews (Phase 3)	2.2	30 jun
Analysis of the interviews results and refinement of the profile (Phase 3)	2.3	10 jul
National report (Phase 3)	2.3	17 jul
D2.1 Report on Data Journalism and Data Communication release	2.3	24 jul
D2.1 Report on Data Journalism and Data Communication review	2.3	31 jul

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Finally, Table 3 presents the list of project partners and outlines the roles and responsibilities assigned to each partner throughout the implementation of this Work Package.

Table 3 List of partners and their role in WP2.

Partners/ Tasks	UAH	AUTH	CCI/ OBCT	UROMA	EVD	OGL	DPITCH	UNL	DEFOIN	INOVA+	IPG
Country	SP	GR	IT	IT	IT	IT	IT	PT	SP	PT	PT
Methodology document release	X										
Template preparation for Desk Research	X										
Collection of the Desk Research results	X	X	X	X	X	X	X	X	X	X	X
Desk research data processing	X										
Publication of the results and partners validation	X	X	X	X	X	X	X	X	X	X	X
Survey preparation and validation	X										
Survey distribution	X	X	X	X	X	X	X	X	X	X	X
Analysis of the survey data and refinement of the profile	X										
Publication of the results and partners validation	X	X	X	X	X	X	X	X	X	X	X
Interviews preparation and validation	X										
Interviews		X	X	X	X	X	X	X	X	X	X
Analysis of the interviews results and refinement of the profile	X										
National report	X	X		X			X				
D2.1 Report on Data Journalism and Data Communication release	X										
D2.1 Report on Data Journalism and Data Communication review	X	X	X	X	X	X	X	X	X	X	X

3. Phases Design

This section describes the methodology and procedures used for data collection throughout the different research phases. In particular, it explains the design of the template used in Phase 1 for collecting courses and training programmes, the development and implementation of the survey and its related questions in Phase 2, and finally the organisation of the interview in Phase 3, including potential interview questions and all other aspects related to the phases defined in sections 2.1, 2.2, and 2.3.

3.1 Phase 1: Designing a template for collecting courses and training programs

In the first phase of the desk research, a structured Excel template was designed in order to systematically collect relevant courses, training programmes, and good practice examples related to the target professional profile in Data Communication and Data Journalism. This template was subsequently shared with all project partners participating in the DAPHnE consortium.

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The Excel file was organised into two separate sheets. The first sheet was dedicated to the collection of training programmes and educational courses. Project partners were asked to identify and report any course, programme, or educational initiative that they considered relevant to the targeted professional profile. The objective of this data collection process was to create a broad overview of existing educational offers, competency requirements, and learning outcomes related to DJDC across different countries and institutional contexts. The template is available in Annex 1 of the report.

For each identified course or training programme, partners were requested to provide the following information:

- **Partner in DAPHnE:** (UAH, AUTH, UNIROMA, EVD, etc.)
- **Research Country (Course Country)**: The country in which the course or programme is offered.
- **Course Type**: The format of the course, such as Online Course, Blended Course, or Class-based Course.
- **Course Name**: Official title of the programme or course.
- **Course Description**: A short summary describing the content and objectives of the course.
- **Course Link**: URL or online access link to the course webpage or related information.
- **Course Competencies (What Participants Will Learn)**: The main skills, competences, and learning outcomes developed through the course.
- **Competences Needed for Students to Access the Course (Requirements)**: Entry requirements or prerequisite competences expected from learners.
- **Context of the Course**: The primary thematic area of the course, such as Data Discovery, Data Visualization, Data Journalism and Storytelling, Combination of Data, Journalism and Visualization, or Other related contexts.
- **Year of Publication**: The year in which the course or programme was published, launched, or updated.
- **Authors (Organisation/Person)**: The institution, organisation, or individual responsible for developing the course.
- **Language**: The language in which the course is delivered.
- **Explanations/Extra Information**: Additional comments or contextual information considered relevant by the partners.

In addition, the second sheet of the Excel template was dedicated to the identification of relevant *good practice examples* associated with the targeted professional profile. Project partners were asked to report examples of innovative, impactful, or transferable practices related to DJDC.

For each good practice example, the following information was requested:

- **Partner in DAPHnE**: (UAH, AUTH, UNIROMA, EVD, etc.)
- **Research Country**: Country where the good practice is implemented or developed.
- **Good Practice Link**: URL or access link to the initiative or example.
- **Good Practice Explanation**: A short description explaining the nature and relevance of the good practice.
- **Context of the Good Practice**: The thematic context of the initiative, such as Data Discovery, Data Visualization, Data Journalism and Storytelling, Combination of Data, Journalism and Visualization, or Other related contexts.
- **Year of Publication**: Year of publication, implementation, or launch.
- **Authors (Organisation/Person)**: Organisation or individuals responsible for the initiative.

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- **Language**: Language in which the initiative or resource is available.
- **Explanations/Extra Information for the Consortium**: Additional notes or contextual comments if necessary.

This structured data collection process enabled the consortium to gather comparable and standardised information from different countries and perspectives, thereby establishing the empirical basis for the subsequent competency extraction, analysis, and classification phases of the research.

After sharing the Excel template with the project partners and receiving the completed contributions, the University of Alcalá (UAH) team proceeded with the extraction and analysis of the collected data. This process included, among other activities, the extraction of competencies and skills associated with each course, the identification and harmonisation of related competences, and the mapping of these skills to the ESCO framework.

3.2 Phase 2: Survey Design

In order to implement the second phase of the research, focused on survey analysis, the University of Alcalá (UAH) team first designed a structured questionnaire based on the objectives of WP2, the results obtained from the desk research phase, and the need to validate and prioritise the identified competence domains. The survey was specifically developed to collect feedback from relevant stakeholders regarding the importance, relevance, and completeness of the competencies associated with the professional profile of DJDC.

The design of the survey questions was guided by several methodological considerations. First, it was considered essential to gather background information about respondents and their organisations in order to understand the diversity of perspectives represented in the survey results. Since the project addresses multiple sectors—including Higher Education (HE), Vocational Education and Training (VET), media organisations, industry, public institutions, and independent professionals—the survey needed to capture the professional context and expertise of participants.

Second, the survey aimed to validate the competence domains identified during the desk research phase. For this reason, respondents were asked to evaluate the relative importance of each competence domain using quantitative rating scales. This approach enabled the consortium to identify which competence areas are considered most relevant by different stakeholder groups and to compare perspectives across sectors.

Third, ranking-based questions were included to encourage respondents to prioritise competence domains according to their perceived importance for the targeted professional profile. This ranking mechanism provides a more nuanced understanding of stakeholder priorities beyond simple importance ratings.

Additionally, open-ended questions were incorporated to allow respondents to suggest additional competence areas or identify potential gaps in the proposed framework. This ensured that the survey remained flexible and inclusive, allowing emerging skills and perspectives not previously identified during desk research to be considered in the analysis.

The survey was structured into two main sections:

- **Section 1 – Background and Respondent Profile**, focused on collecting demographic, organisational, and professional information about respondents, including stakeholder category, country, familiarity with DJDC, and the DAPHnE partner through which respondents accessed the survey.

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- **Section 2 – Data Journalism and Data Communication Skills Needs**, focused on evaluating the identified competence domains, measuring their perceived importance, ranking them according to relevance, and collecting suggestions for additional skills or competence areas.

The questionnaire was developed and deployed using the EUSurvey platform. In order to maximise accessibility and participation across the consortium countries, the survey was translated into four languages: English, Spanish, Italian, and Portuguese.

The public access link to the survey is available at: DAPHnE EU Project Survey[1]

The survey is also included in Annex 2 of this report.

3.3 Phase 3: Interview Design

Following the collection, analysis, and interpretation of the survey results, the next phase of the research focused on the design of a semi-structured interview protocol. The primary objective of this phase was to complement the quantitative findings obtained through the survey with qualitative insights from experienced professionals, educators, researchers, and other stakeholders working in the fields of DJDC.

The interview design was also developed to validate the competency framework identified during the desk research and survey phases, gather expert opinions regarding emerging skills and future trends, and identify potential competency gaps from both educational and labour market perspectives. To ensure consistency across interviews while still allowing flexibility for participants to elaborate on their experiences and viewpoints, a semi-structured format was adopted.

The interview protocol was organised into four main sections, each addressing a specific research objective. The template was distributed to the partners in order to complete the interviews.

3.3.1 Section 1: Interviewee Profile

The first section was designed to collect background information about the interview participant. This information enables the contextualisation of responses and supports the interpretation of results according to professional background, sector, and expertise.

The following information was collected:

1) Name of the interviewee
2) Current Position/Job Title
3) Organization/Institution
4) Country
5) Industry Sector
6) Area(s) of Expertise
7) Years of Professional Experience (minimum of five years required)
8) Brief Description of Current Professional Roles

A minimum professional experience requirement of five years was established to ensure that interviewees possessed sufficient expertise and practical knowledge of the field to provide informed and reliable feedback.

[1] https://ec.europa.eu/eusurvey/runner/Daphne-EUProject

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3.3.2 Section 2: Competency Importance Assessment

The second section focused on validating and refining the competency framework developed during the previous phases of the research. Its objective was to assess the perceived importance of each competency domain and collect expert feedback regarding the structure and completeness of the proposed skills model.

To facilitate informed discussion, interviewees could be provided in advance with a PowerPoint presentation summarising the results of the survey analysis. This enabled participants to review the findings before the interview and prepare reflections on the proposed competency framework.

The following follow-up questions were included:

1) Please explain your agreement or disagreement with the obtained results. What additional competencies are not included in this framework but should be considered? Are there any skills or skill groups you believe should be added, merged, removed, or renamed?
2) Please rank the following competency areas from most important (1) to least important (9) according to your experience:

   - Data & Analytics
   - Data Journalism & Investigation
   - Communication & Storytelling
   - Visualization & Content Production
   - Digital Media & Tools
   - AI & Emerging Technologies
   - Media, Ethics & Governance
   - Business & Strategy
   - Professional & Collaborative Skills

This section was intended not only to validate the competency domains identified through desk research and survey analysis but also to capture nuanced expert perspectives that may not emerge through quantitative methods alone.

3.3.3 Section 3: Professional Background and Future Perspectives

The third section aimed to understand the participant's broader perspective on the evolution of DJDC as a professional field. Particular attention was given to identifying emerging trends, technological developments, and future competency requirements.

The following question was included:

1) What is today's data journalism competency landscape, and which emerging trends are likely to shape the profession in the next 3–5 years? Which three competency areas will become most important in the next five years?

This section provides valuable insights into the future evolution of the profession and helps identify competencies that may become increasingly relevant as technologies, media ecosystems, and audience expectations continue to evolve.

3.3.4 Section 4: Skills Gap Analysis

The final section focused on identifying current competency deficiencies and educational gaps observed by professionals working in the field. The objective was to compare the preparedness

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of graduates entering the profession through different educational pathways and identify areas for future curriculum development.

The following questions were included:

1) What are the most common skill gaps you observe among professionals entering the field coming from Higher Education (HE)? *(Only applicable if the interviewee works with university graduates.)*
2) What are the most common skill gaps you observe among professionals entering the field coming from Vocational Education and Training (VET)? *(Only applicable if the interviewee works with VET graduates.)*

The responses gathered in this section provided important evidence regarding the alignment between educational provision and labour market needs, thereby supporting the identification of competency gaps and informing future training and curriculum development activities within the DAPHnE project.

Overall, the interview protocol was designed to complement the findings obtained through desk research and survey analysis by incorporating expert judgement, professional experience, and forward-looking perspectives. This triangulation of data sources contributes to a more robust and comprehensive competency framework for the DJDC professional profile.

4. Data Journalism and Data Communication across the EU (and beyond) – A nutshell

DJDC have emerged as key practices in contemporary media ecosystems, driven by the increasing availability of open data, digital tools, and computational methods. Across the European Union, these practices are increasingly recognised as essential for transparency, democratic accountability, and evidence-based public discourse.

In the EU context, initiatives such as the European Data Portal[2] and the Open Data Directive (EU 2019/1024)[3] have significantly contributed to the expansion of accessible public datasets, enabling journalists and communicators to transform complex data into meaningful narratives for citizens. At the same time, leading news organisations and collaborative networks such as the European Journalism Centre (EJC)[4] and the Global Investigative Journalism Network (GIJN)[5] have played a crucial role in fostering cross-border investigative data journalism practices and capacity building.

From a global perspective, data journalism is now a well-established field that combines journalism, statistics, design, and computational methods. As highlighted by Gray, Bounegru, and Chambers [3], data journalism can be understood as “a new form of storytelling that relies on the analysis and visualisation of large datasets to reveal patterns, trends, and insights that would otherwise remain hidden.” Similarly, the work of Rogers [4] and the Data Journalism Handbook emphasises the shift from traditional reporting towards hybrid roles that integrate coding, data analysis, and narrative design.

DJDC are increasingly recognised as transversal fields that sit at the intersection of media, technology, and data science. Their rapid evolution has created a growing demand for structured skills development across different educational and professional contexts. However,

[2] https://data.europa.eu/en
[3] https://eur-lex.europa.eu/eli/dir/2019/1024/oj
[4] https://ejc.net/
[5] https://gijn.org/stories/data-journalism/

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the way these competencies are defined, taught, and applied varies significantly depending on the context—particularly across Higher Education (HE), Vocational Education and Training (VET), and the Labour Market. Understanding these differences is essential for designing coherent training pathways and ensuring alignment between education systems and industry needs.

The comparative perspectives presented in this section emerge directly from the empirical evidence and documentary mapping gathered during the initial Desk Research phase (Phase 1) conducted within WP2. By examining existing university curricula, vocational training offerings, and professional frameworks submitted by project partners, this synthesis delineates how DJDC competencies are structuralized differently across Higher Education (HE), Vocational Education and Training (VET), and real-world labour market environments. Establishing this baseline derived from WP2 research findings allows the consortium to identify critical educational gaps and provide a clear rationale for the integrated competency framework developed in subsequent project activities.

4.1 Higher Education (HE) Perspective

In Higher Education, data journalism and communication are typically embedded within broader academic programmes such as journalism, communication studies, media studies, or digital humanities. The focus is primarily conceptual and analytical.

Key skills in HE include:

- Theoretical understanding of journalism, media systems, and data ecosystems
- Critical thinking and data interpretation
- Research methodology and academic writing
- Introduction to programming, data analysis, and statistics
- Ethical reasoning and data governance awareness
- Data storytelling as a conceptual and analytical practice

HE emphasises **why and how data is used**, encouraging students to critically evaluate data sources, methodologies, and societal implications. The outcome is often a combination of analytical competence and academic literacy rather than immediate job-specific technical mastery.

4.2 Vocational Education and Training (VET) Perspective

In contrast, VET focuses on practical, occupation-oriented skills that directly prepare learners for the labour market. Data journalism and communication in VET contexts are more applied and tool-driven.

Key skills in VET include:

- Practical use of data analysis tools (e.g., spreadsheets, SQL, basic Python)
- Data visualisation using industry-standard software
- CMS (Content Management Systems) and digital publishing tools
- Infographic design and multimedia storytelling
- Basic data cleaning and transformation techniques
- Applied newsroom workflows and production processes

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VET prioritises **how to do it**, with strong emphasis on employability, task execution, and operational readiness. Learning is often project-based, simulation-driven, and closely aligned with industry practices.

4.3 Labour Market Perspective

The labour market represents the applied environment where data journalism and communication skills are operationalised in real-world contexts such as newsrooms, media organisations, NGOs, and communication agencies.

Key skills demanded in the labour market include:

- Advanced data analysis and investigative journalism techniques
- Use of programming languages for data scraping and automation
- Data-driven storytelling under time constraints
- Cross-functional collaboration (journalists, developers, designers)
- Audience analytics and engagement strategies
- Strong adaptability to emerging digital tools and AI-driven workflows

Here, the focus is on **performance, speed, and impact**. Professionals are expected to integrate multiple skill sets and respond to fast-changing information environments.

4.4 Key Differences in Skills Across HE, VET, and Labour Market

While all three domains share a common foundation in data literacy and communication, their emphasis differs significantly:

- **HE** prioritises critical thinking, theory, and methodological understanding.
- **VET** focuses on applied technical and operational skills for immediate employability.
- **Labour Market** demands hybrid professionals capable of combining technical expertise, storytelling, and real-time problem-solving.

In summary, HE builds the foundation of knowledge, VET develops the capacity for application, and the Labour Market requires integration, speed, and adaptability.

5. Results

As described in Section 3.1 *Phase 1: Desk Research* of the Methodology, the University of Alcalá (UAH) initially developed a structured Excel template and requested project partners to identify and report relevant training programmes and courses related to DJDC.

The purpose of this structured data collection was to ensure a consistent and comparable mapping of existing educational and training initiatives across different countries and institutional contexts. The Excel file was designed with two main sheets. The first sheet, titled *Sample Profile*, was used to collect detailed information on training programmes and courses. This included fields such as: Partner, Research Country (course country), Course Type, Perspective (HE/VET), Course Name, Course Description, Course Link, Course Competencies (what participants will learn), Competences Needed for Students (entry requirements), Context of the Course, Year of Publication, Authors (organisation/person), and Language.

The second sheet, titled *Good Practices*, was designed to capture examples of relevant initiatives and best practices in the field. The information requested included: Partner in DAPHnE, Research

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Country, Good Practice Link, Good Practice Explanation, Context of the Good Practice, Year of Publication, Authors (organisation/person), and Language.

This structured approach allowed for a systematic comparison of initiatives across different educational and professional contexts. In total, partners identified 38 training programmes and courses related to DJDC, as well as 26 good practice examples. These inputs constitute the empirical basis of the results presented in the following sections.

5.1 First Observations

As mentioned in the introduction to this section, project partners identified 38 training programmes and courses related to DJDC. Through a detailed review of each case, all the skills and competencies repeatedly addressed within these educational programmes were extracted and analysed.

For instance, Table 4 presents a sample of these training programmes and courses together with their associated skills and competencies. It should be noted that the competency descriptions were preserved exactly as they appeared in the original course descriptions provided by the partners.

In total, 217 skills and competencies were extracted from the analysed training programmes and courses.

Table 4 Relevant courses to DJDC recommended by partners

Course Name	Skills and Competences participants will learn
Data Literacy for Journalists	Data journalism
	Data collection
	FOI (Freedom of Information) skills
	Data cleaning and analysis
	Understanding data
	Presenting data
	Data ethics
Data Journalism	Data collection and processing
	Data visualization techniques
	Data-driven storytelling
	Use of digital media tools
	Interpretation of datasets for journalism
Data Journalism Specialization	Data mining and analysis
	Machine learning basics
	Data visualization
	Data-driven investigations
	Storytelling with data
Data and Participatory Journalism	Data handling and datasets
	Data visualization tools
	Participatory journalism
	Publishing data-driven articles
	Managing user-generated content
Data Storytelling: Bringing Data to Life	Data storytelling techniques
	Narrative building

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	Visual communication
	Audience engagement
	Communication of complex data
⋮	⋮

A more detailed analysis of the 217 extracted skills revealed that many of them were essentially identical in meaning, differing only in terminology or wording. For example, expressions such as *Data visualization techniques*, *Data visualization tools*, *Data presentation: charts, maps, timelines, and other interactive visualizations*, *Creative data visualization*, and *Visualize information* all generally refer to the broader competency of 'Data Visualization', despite some of them being more specialised or referring to specific tools and applications.

Therefore, a decision was made to standardise and harmonise the list of extracted skills and competences by assigning a common label or overarching term to related competencies. This process enabled the consolidation of semantically similar skills under unified categories, facilitating a clearer and more structured analysis.

As another example, Table 5 illustrates how the skills presented in Table 1 can be mapped to the broader category of 'Data Analysis', which represents the general competency area encompassing these related skills.

Table 5 List of Skills and Competences in the Courses (with similar meaning to Data Analysis)

List of Skills and Competences in the Courses (with similar meaning)	Equivalent competence
Data cleaning and analysis	Data Analysis
Data mining and analysis	Data Analysis
Data analysis for reporting	Data Analysis
Data extraction and analysis tools	Data Analysis
Data exploration	Data Analysis
Data analysis and interpretation	Data Analysis
Data analysis tools and techniques	Data Analysis
data analysis: basic concepts, techniques and methodologies	Data Analysis
Working with databases and data analysis	Data Analysis
Big Data Analysis	Data Analysis
Data analytics	Data Analysis
Critical analysis of datasets and data reuse	Data Analysis
clean and analyse data	Data Analysis
analysis of datasets	Data Analysis
Cleaning and analysing data	Data Analysis
Analysing datasets with AI	Data Analysis
Data analysis	Data Analysis
Data mining	Data Analysis
basic data analysis	Data Analysis

Ultimately, after the harmonisation and consolidation process, a final list of 78 general skills and competencies required for DJDC was identified. Table 6 presents a sample of this list, together with the frequency of occurrence of each competency among the initial 217 extracted skills (Table 5), as well as the average frequency associated with each skill. We call this list of competences as core competences for DJDC profile.

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The purpose of calculating this average was to provide an initial indication of the relative importance and prevalence of the competencies required for this professional profile. This preliminary quantitative overview helps identify the skills that appear most consistently across the analysed training programmes and courses.

Table 6 Core competences and the number of their repetitions

Core competence	Number of repetitions	Average
Data Analysis	20	0.092165899
Data Storytelling	15	0.069124424
Data Visualization	20	0.092165899
Data Journalism	10	0.046082949
Open Data	9	0.041474654
Artificial Intelligence	8	0.036866359
Data Collection	7	0.032258065
Data Processing	7	0.032258065
Data Management	5	0.023041475
Investigative Journalism	5	0.023041475
Critical Thinking	4	0.01843318
Data Communication	4	0.01843318
Data Literacy	4	0.01843318
Digital Journalism	4	0.01843318
Research Skills	4	0.01843318
Content Creation	3	0.013824885
Content Strategy	3	0.013824885
Data Ethics	3	0.013824885
Digital Analytics	3	0.013824885
Spreadsheet Analysis	3	0.013824885
Statistics	3	0.013824885
Analytical Thinking	2	0.00921659
Audience Engagement	2	0.00921659
⋮	⋮	⋮

5.2 Grouping of Core Competences

A closer examination of the core competences presented in Table 6 reveals that many of these competences belong to broader domains with common characteristics, objectives, and areas of application. Although the extracted competences were initially identified as individual skills, several of them are strongly interconnected and contribute to similar functional areas within DJDC.

For this reason, grouping the competences into broader categories was considered necessary for several methodological and analytical reasons. First, the clustering process helps reduce fragmentation and complexity within the competency framework, making the results easier to interpret and compare. Second, grouping allows for the identification of major competency domains that characterise the professional profile of data journalists and data communicators. Third, this approach facilitates the comparison of competency needs across Higher Education (HE), Vocational Education and Training (VET), and Labour Market perspectives, since these sectors often prioritise competency domains rather than isolated skills.

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In addition, categorising the competences enables a more structured understanding of the relationships between technical, analytical, communication, and ethical skills. This is particularly important in interdisciplinary fields such as DJDC, where professional performance depends on the integration of multiple complementary competences rather than on a single isolated ability.

After extracting 217 skills from the analysed courses and training programmes related to DJDC, the University of Alcalá research team conducted a detailed manual review of the extracted data. This analysis revealed that many of the identified skills represented different expressions of the same underlying competence. For example, *Data Cleaning and Analysis*, *Data Analysis for Reporting*, and *Data Exploration* all refer to the broader concept of Data Analysis. Similarly, several other extracted skills exhibited substantial semantic overlap and could be consolidated into more comprehensive competence categories.

Consequently, the initial list of 217 skills was manually consolidated into 78 Core Competences, each representing a distinct professional capability required within the target occupational profile. These Core Competences were subsequently organised into higher-level Competence Domains to establish a coherent competency framework. Although the final categorisation was primarily based on expert judgement, modern NLP-based clustering techniques were employed to support and validate the process. Specifically, the competence descriptions were transformed into semantic vector representations using a transformer-based Large Language Model (LLM). The resulting embeddings were then projected into a lower-dimensional space using UMAP (Uniform Manifold Approximation and Projection), after which HDBSCAN (Hierarchical Density-Based Spatial Clustering of Applications with Noise) was applied to identify naturally occurring semantic clusters. The clustering results demonstrated a high level of agreement with the expert-driven categorisation, ultimately supporting the definition of nine Competence Domains, each named according to the common characteristics of its constituent Core Competences.

Therefore, after a detailed review of all identified competences and their corresponding areas of application, the skills were classified into the competency groups presented in Table 7. These groups represent broader domains of expertise that encompass related competences sharing similar objectives, functions, or professional applications.

Table 7 Competence domains for DJDC profile.

Competence domain	Core competences
Data & Analytics	Data Analysis, Data Collection, Data Processing, Data Management, Data Interpretation, Data Literacy, Data Sourcing, Database Management, Spreadsheet Analysis, Statistics, Digital Analytics, Open Data, Data Verification
Data Journalism & Investigation	Data Journalism, Investigative Journalism, Investigative Data Journalism, Accountability Journalism, Fact-Checking, Freedom of Information (FOI), Source Management, Research Skills
Communication & Storytelling	Data Storytelling, Data Communication, Communication, Digital Communication, Media Communication, Journalism Writing, Digital Writing, Storytelling, Visual Communication, Audience Engagement, Audience Analysis, Communication Strategy
Visualization & Content Production	Data Visualization, Information Design, Content Creation, Content Creation Tools, Content Curation, Content Distribution, Content Management, Digital Publishing, Media Production, Broadcast Journalism, Photojournalism,

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Digital Media & Tools	Digital Journalism, Digital Literacy, Digital Workflow, Digital Media Tools, Digital Tools, Data Journalism Tools, Research Tools, SEO, Social Media, Media Trends, Digital Trends
AI & Emerging Technologies	Artificial Intelligence, Ethical AI, AI Strategy, Machine Learning, Innovation
Media, Ethics & Governance	Data Ethics, Data Privacy, Media Law & Ethics, Media Credibility, Journalism Fundamentals, Participatory Journalism, Domain Knowledge
Business & Strategy	Business Models, Journalism Business Models, Revenue Models, Marketing Strategy, Digital Advertising, Content Strategy
Professional & Collaborative Skills	Critical Thinking, Analytical Thinking, Collaboration, Project Management, Portfolio Development, Time Management

The selection of appropriate names for the competence domains was considered an important step in the development of the competency framework, as the domain titles needed to be sufficiently broad to encompass related skills while remaining specific enough to clearly represent their functional focus. The naming process was therefore based on several criteria, including semantic coherence, professional relevance, alignment with existing educational and labour market terminology, and the interdisciplinary nature of DJDC. In addition, the selected domain names were designed to facilitate interpretation by different stakeholders, including Higher Education institutions, VET providers, researchers, employers, and policymakers. As a result, the final competence domains reflect both the practical and conceptual dimensions of the field, while also supporting future curriculum design, skills mapping, and competency assessment activities.

From an analytical perspective, the identified competence domains appear to provide a comprehensive coverage of the skills required for the professional profile of DJDC. The domain **Data & Analytics** addresses the foundational competencies related to data collection, interpretation, statistical reasoning, and analytical thinking, which are essential for working with data-driven content. **Data Journalism & Investigation** focuses on investigative methodologies, fact-checking, verification processes, and the journalistic use of datasets to produce evidence-based reporting.

The domains **Communication & Storytelling** and **Visualization & Content Production** represent the communicative dimension of the profession, emphasising the ability to transform complex data into accessible narratives, visual formats, and audience-oriented content. These competences are central to ensuring that data-driven insights can be effectively communicated to different audiences.

Similarly, **Digital Media & Tools** and **AI & Emerging Technologies** capture the increasing technological dimension of the field. They include competencies related to digital platforms, software tools, automation, artificial intelligence, and emerging media technologies that are progressively shaping contemporary journalistic and communication practices.

The domain **Media, Ethics & Governance** reflects the growing importance of ethical awareness, media regulation, transparency, privacy, and responsible data usage. Given the societal

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implications of data-driven communication, these competences are particularly important in ensuring credibility and public trust.

Furthermore, **Business & Strategy** acknowledges that professionals in this field increasingly operate within digital media ecosystems shaped by sustainability models, audience engagement strategies, platform economies, and organisational objectives. Finally, **Professional & Collaborative Skills** covers transversal competences such as teamwork, project management, adaptability, communication, and interdisciplinary collaboration, all of which are essential in modern data-driven working environments.

Overall, the proposed competence domains provide a balanced representation of the technical, analytical, communicative, ethical, strategic, and professional dimensions required for DJDC. Although the field continues to evolve rapidly—particularly due to advances in AI and digital technologies—the identified domains offer a sufficiently flexible and comprehensive framework for analysing current and emerging competency needs across HE, VET, and Labour Market perspectives.

5.3 ESCO observations

5.3.1 Algorithms for Similarity Analysis

In this section, we describe the methodology and algorithms used to identify the ESCO skills that are most closely related to the Core Competences extracted in Table 5 and Table 7. The objective of this process was to establish a systematic mapping between the competency framework developed in this study and the ESCO skills classification, thereby facilitating future alignment with European skills and occupational frameworks.

To perform this analysis, several Python libraries were used. The main libraries included:

- pandas: for loading, processing, and exporting CSV data.
- sentence-transformers: for generating semantic embeddings using transformer-based language models.
- numpy: for numerical operations and vector manipulation.
- scikit-learn: for calculating cosine similarity between embeddings.

As a first step, the Core Competences and the ESCO skills dataset were stored in two separate CSV files. The Core Competences file contained the competency labels identified during the desk research and consolidation phases, while the ESCO file contained the skill labels and, where applicable, their descriptions extracted from the ESCO database.

To improve the semantic representation of the data, skill labels and descriptions were combined when available. The resulting textual information was then converted into vector embeddings using the *Sentence-BERT (S-BERT) MPNet-based model*, which is specifically designed to capture semantic similarity between short texts. These techniques have been used in different works such as [1], [2].

Once the embeddings had been generated, semantic similarity between each Core Competence and each ESCO skill was calculated using the Cosine Similarity algorithm. Cosine similarity is widely used in natural language processing to measure the semantic closeness between two vector representations. The full Python script can be found in Zenodo repository[6].

[6] https://zenodo.org/records/21376018

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Finally, the resulting similarity scores were stored in a CSV file and sorted in descending order for each Core Competence. This ranking enabled the identification of the ESCO skills that exhibited the highest semantic similarity with each competency extracted from the desk research.

As an example, Table 8 presents a subset of the results obtained for the Core Competence Data Analysis, showing the ESCO skills with the highest similarity scores. These results provide an evidence-based mechanism for linking the competency framework developed within the project to existing European skills taxonomies and support the subsequent development of occupational profiles, learning outcomes, and training curricula.

Table 8 Similar ESCO skills to Data Analysis

Core competence: Data analysis	
ESCO Skill/Knowledge	**Similarity**
perform data analysis	0.718374729
statistical analysis system software	0.651262045
apply statistical analysis techniques	0.649452269
inspect data	0.634281754
empirical analysis	0.631884336
statistics	0.624056995
business analytics	0.621610045
use data processing techniques	0.616708994
⋮	⋮

5.3.2 Threshold Determination

Following the computation of semantic similarity scores between the identified Core Competences and ESCO skills, it was necessary to define a threshold in order to distinguish relevant matches from weak or potentially unrelated associations. Without such a threshold, the mapping process would return a large number of ESCO skills for each Core Competence, including many with only marginal semantic relevance. Therefore, a filtering mechanism was required to improve the quality, interpretability, and practical usefulness of the results.

For the purposes of this study, a transparent thresholding approach was adopted to identify relevant ESCO skills. Specifically, all ESCO skills with a cosine similarity score below 0.50 were considered insufficiently related and were therefore excluded from further analysis. To ensure the scientific and practical validity of this cut-off point, the 0.50 threshold was empirically tested and validated through preliminary pilot mappings and expert qualitative review within the research team. Initial evaluations revealed that higher thresholds (e.g., above 0.65 or 0.70) were excessively restrictive, unnecessarily discarding valid ESCO concepts due to minor stylistic or terminological differences. Conversely, lower thresholds (e.g., below 0.40) introduced significant semantic noise by retaining overly broad or generic skills. The selected value of 0.50—supported by standard NLP literature for sentence embeddings—was confirmed by internal domain experts as providing the optimal balance between precision and coverage, ensuring that only meaningfully aligned ESCO skills were retained without compromising the breadth of the framework.

In addition to applying the similarity threshold, the analysis was further restricted to the **Top 10 highest-ranked** ESCO skills/knowledge examples for each Core Competence. This decision was made to avoid excessive noise in the results and to focus on the most representative and relevant ESCO skills associated with each competency. Since the objective was to identify the

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strongest semantic matches rather than generate an exhaustive list, limiting the results to the top-ranked candidates improved both clarity and interpretability.

After applying the similarity threshold and retaining only the Top 10 matches for each Core Competence, all extracted ESCO skills were aggregated into a single consolidated list. A duplicate removal process was then performed in order to eliminate overlapping skills that had been identified for multiple Core Competences. This step ensured that the final dataset represented a unique set of ESCO skills associated with the DJDC competency framework.

5.3.3 Relevant ESCO Competences to Core Competences

Based on the methodology described in Sections 5.3.1 and 5.3.2, semantically and conceptually related ESCO skills were identified for each of the Core Competences presented in Table 7. The objective of this mapping process was to establish a robust connection between the competency framework developed within the DAPHnE project and the European Skills, Competences, Qualifications and Occupations (ESCO) framework. By linking the identified Core Competences to existing ESCO skills, the resulting competency profile becomes more interoperable with European educational, training, and labour market frameworks, while also facilitating future curriculum design, learning outcome definition, and occupational profile development.

The results of this mapping process are presented in the following sections. To improve readability and support a more structured analysis, the identified ESCO skills are organised according to the Competence Domains introduced in Table 7. For each Competence Domain, the corresponding Core Competences are presented together with the ESCO skills that exhibited the highest semantic similarity and satisfied the threshold criteria described in the previous section. In the following tables, (S) refers to a ESCO skill example and (K) refers to a knowledge example as defined in the ESCO database.

Table 9 Relevant ESCO illustrative example to competence domain 1: Data & Analytics

Competence domain 1: Data & Analytics	
Core competence	**ESCO Illustrative Examples**
Data Analysis	perform data analysis (S) statistical analysis system software (K) apply statistical analysis techniques (S) inspect data (S) empirical analysis (K) statistics (K) business analytics (K) use data processing techniques (S) analyse data about clients (S) identify statistical patterns (S)
Open Data	gather data (S) search databases (S) manage findable accessible interoperable and reusable data (S) analyse big data (S) online analytical processing (K) evaluate data, information and digital content (S)
Data Collection	collect ICT data (S) record survey data (S) handle data samples (S) manage data collection systems (S) process collected survey data (S) manage research data (S)

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	polling techniques (K)
Data Processing	process data (S) develop data processing applications (S) digital data processing (0) normalise data (S) signal processing (K) establish data processes (S) perform data mining (S) data mining (K)
Data Management	use databases (S) manage data (S) implement data warehousing techniques (S) manage data, information and digital content (S) SAS Data Management (K) implement data quality processes (S) database development tools (K) data warehouse (K)
Data Literacy	data analytics (K) teach digital literacy (S) make data-driven decisions (S) deliver visual presentation of data (S)
Digital Analytics	web analytics (K) use analytics for commercial purposes (S) marketing analytics (K) news analytics (K)
Spreadsheet Analysis	use spreadsheets software (S)
Statistics	develop statistical software (S) statistical quality control (K) present reports (S) medical statistics (K) biostatistics (K)
Data Interpretation	interpret extraction data (S)
Data Sourcing	data quality assessment (K) data extraction, transformation and loading tools (K) collect financial data (S) interpret current data (S)
Database Management	manage database (S) database management systems (K) operate relational database management system (S) maintain database performance (S) write database documentation (S) maintain database security (S) balance database resources (S) create database diagrams (S)
Data Verification	check request legitimacy (S) maintain data entry requirements (S) check correctness of information (S) verify formal ICT specifications (S)

Table 10 Relevant ESCO illustrative example to competence domain 2: Data Journalism & Investigation

Competence domain 2: Data Journalism & Investigation

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Core competence	ESCO Illustrative Examples
Data Journalism	news analytics (K) evaluate data, information and digital content (S) journalism (K) report live online (S) newsletter analysis (K) manage research data (S)
Investigative Journalism	check stories (S) interrogate individuals (S) investigation research methods (K) check methods (K) analyse issues (S) journalistic principles (K) examine crime scenes (S)
Investigative Data Journalism	gather data for forensic purposes (S) forensic intelligence (K)
Freedom of Information (FOI)	information confidentiality (K) data protection (K) respect data protection principles (S) ensure information transparency (S) ensure information privacy (S)
Fact-Checking	check correctness of information (S) check request legitimacy (S)
Source Management	maintain a central project repository (S) Source (digital game creation systems) (K) tools for software configuration management (K) manage information sources (S) project configuration management (K)
Research Skills	write scientific publications (S) demonstrate disciplinary expertise (S) study topics (S) use questioning techniques (S) perform business research (S) conduct scholarly research (S) conduct research interview (S)

Table 11 Relevant ESCO illustrative example to competence domain 3: Communication & Storytelling

Competence domain 3: Communication & Storytelling	
Core competence	**ESCO Illustrative Examples**
Data Storytelling	deliver visual presentation of data (S) news analytics (K) gather data (S) tell a story (S) create animated narratives (S)
Audience Engagement	interact with an audience (S) enable audience participation (S) engage the audience emotionally (S) entertain guests interactively (S) entertain people (S) act for an audience (S) address an audience (S)

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	apply customer engagement strategy (S)
	develop visitor engagement strategies (S)
	engage passers-by in conversation (S)
Communication	use communication techniques (S)
	teach communication to clients (S)
	communicate with target community (S)
	communication (K)
	communication principles (K)
	promote communication between parties (S)
	communicate with youth (S)
	advise on communication strategies (S)
	inter-professional communication in the psychosocial field (K)
	business communication (K)
Digital Communication	digital communication and collaboration0
	transmission technology (K)
	signal processing (K)
	digital media (K)
	electronic communication (K)
	digital systems (K)
	install signal repeaters (S)
	use different communication channels (S)
	communicate with media (S)
	media and information literacy (K)
	interactive media (K)
	communication sciences (K)
	communication studies (K)
	establish relationship with the media (S)
	media studies (K)
	study media sources (S)
Audience Analysis	survey techniques (K)
	assess customers (S)
	participant observation (K)
	analyse data about clients (S)
	market research (K)
	study community as a target community (S)
	interpret customer non-verbal communication (S)
	analyse the comments of selected audiences (S)
	meet expectations of target audience (S)
	analyse reports provided by passengers (S)
Digital Writing	lay out digital written content (S)
	type on electronic devices (S)
	use typesetting software (S)
	typesetting machines (K)
	discern written communication (S)
	provide written content (S)
	typography (K)
Visual Communication	graphic design (K)
	develop visual elements (S)
	determine visual concepts (S)
	interpret graphical communication interfaces (S)
	design graphics (S)

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Table 12 Relevant ESCO illustrative example to competence domain 4: Visualization & Content Production

Competence domain 4: Visualization & Content Production	
Core competence	**ESCO Illustrative Examples**
Data Visualization	data visualisation software (K) deliver visual presentation of data (S) prepare visual data (S) visual presentation techniques (K) use data processing techniques (S) perform data mining (S) data analytics (K) data models (K) graphic design (K) online analytical processing (K)
Content Creation	create digital content (S) digital content creation (0) manage content development projects (S) develop digital content (S) content development processes (K) integrate content into output media (S) translate requirement concepts into content (S) provide multimedia content (S) publishing strategy (K) apply tools for content development (S)
Digital Publishing	publishing industry (K) publishing market (K) digital journalism (K) desktop publishing (K) authoring software (K) digital curation (K)
Broadcast Journalism	journalism (K) report live online (S) prepare broadcasts (S) teach communication sciences (S) present during live broadcasts (S) monitor media industry research figures (S) media studies (K) communication sciences (K) give interviews to media (S)
Content Creation Tools	use content management system software (S) adobe creative suite (K)
Content Curation	manage online content (S) manage data, information and digital content (S) manage content metadata (S) integrate and re-elaborate digital content (S)
Content Distribution	share through digital technologies (S) content marketing strategy (K)
Content Management	manage digital libraries (S)
Information Design	structure information (S) information structure (K) information architecture (K)

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	design information system (S) organise information (S) analyse information systems (S) keep up with the latest information systems solutions (S) assess informational needs (S)
Media Production	create script for artistic production (S) assess studio production (S) study media sources (S) operate media integration systems (S) multimedia systems (K) interactive media (K)
Photojournalism	take pictures (S) photography (K)

Table 13 Relevant ESCO illustrative example to competence domain 5: Digital Media & Tools

Competence domain 5: Digital Media & Tools	
Core competence	**ESCO Illustrative Examples**
Digital Tools	use traditional toolbox tools (S) use equipment, tools or technology with precision (S) consult technical resources (S) produce customised tools (S) use precision tools (S) digitise documents (S)
Digital Media Tools	edit digital moving images (S) use media software (S) transfer uncut audiovisual material to computer (S) configure media integration systems (S) prevent technical problems with media integration systems (S) design a media integration system (S) digital media (K) put uncut recordings into computer (S)
Digital Workflow	develop ICT workflow (S) file-based workflow (K) create digital content (S) problem-solving with digital tools (0) digital data processing0 manage data, information and digital content (S) digital systems (K) create digital files (S) digital content creation0 design process (S)
Research Tools	manage research data (S) evaluate research activities (S) manage open publications (S) promote open innovation in research (S) conduct clinical software research (S)
SEO	search engine optimisation (K) search engines (K) enhance website visibility (S)
Social Media	social media management (K) social media marketing techniques (K)

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	stay up to date with social media (S)
	plan social media marketing campaigns (S)

Table 14 Relevant ESCO illustrative example to competence domain 6: AI & Emerging Technologies

Competence domain 6: AI & Emerging Technologies	
Core competence	**ESCO Illustrative Examples**
Artificial Intelligence	principles of artificial intelligence (K) artificial neural networks (K) data mining (K) utilise machine learning (S)
Ethical AI	data ethics (K) ethics (K)
Machine Learning	machine learning (K) ML (computer programming) (K) perform data mining (S) data science (K)
Innovation	think innovatively (S) innovate in ICT (S) seek innovation in current practices (S) create new concepts (S) social innovation (K) innovation processes (K) promote open innovation in research (S) think creatively (S) brainstorm ideas (S) develop creative ideas (S)

Table 15 Relevant ESCO illustrative example to competence domain 7: Media, Ethics & Governance

Competence domain 7: Media, Ethics & Governance	
Core competence	**ESCO Illustrative Examples**
Media Law & Ethics	media law (K) press law (K) communications sector policies (K)
Data Privacy	data protection (K) information confidentiality (K) ensure information privacy (S) respect data protection principles (S) data security principles (K) data ethics (K) protect personal data and privacy (S) educate on data confidentiality (S) GDPR (K) apply information security policies (S)
Journalism Fundamentals	journalistic principles (K) teach journalistic practices (S) journalism (K) write headlines (S) digital journalism (K) ethical code of conduct of journalists (K) give interviews to media (S) follow ethical code of conduct of journalists (S)

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	critically evaluate information and its sources (S) study media sources (S)
Media Credibility	communicate with media (S) media studies (K) establish relationship with the media (S)
Participatory Journalism	draft press releases (S) report live online (S) work closely with news teams (S)

Table 16 Relevant ESCO illustrative example to competence domain 8: Business & Strategy

Competence domain 8: Business & Strategy	
Core competence	**ESCO Illustrative Examples**
Journalism Business Models	publishing industry (K) digital journalism (K) journalism (K) create online news content (S) monitor media industry research figures (S)
Revenue Models	analyse business model (S) develop revenue generation strategies (S) maximise sales revenues (S) sell services (S) identify new business opportunities (S) use theoretical marketing models (S)
Business Models	business analysis (K) social entrepreneurship (K) blockchain-based business models (K) identify potential markets for companies (S)
Content Strategy	content marketing strategy (K) manage content development projects (S) publishing strategy (K) develop media strategy (S) manage online content (S) develop digital content (S) translate requirement concepts into content (S) provide multimedia content (S) integrate and re-elaborate digital content (S)
Digital Advertising	online ads campaign techniques (K) digital marketing techniques (K) advertising techniques (K) plan digital marketing (S) buy advertising space (S) create advertisements (S) provide advertisement samples (S) outdoor advertising (K) evaluate advertising campaign (S) pay-per-click (K)
Digital Trends	trendwatching (K) digital curation (K) keep up with trends (S) analyse cultural trends (S) emergent technologies (K)

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	toys and games trends (K) stay up to date with social media (S) video-games trends (K)
Marketing Strategy	implement sales strategies (S) plan marketing strategy (S) sales strategies (K) implement marketing strategies (S) marketing management (K) draw up marketing and sales plan (S) advise on market strategies (S) market research (K) marketing mix (K)
Media Trends	media studies (K) monitor sociological trends (S) types of media (K) study media sources (S) follow the news (S)

Table 17 Relevant ESCO illustrative example to competence domain 9: Professional & Collaborative Skills

Competence domain 9: Professional & Collaborative Skills	
Core competence	**ESCO Illustrative Examples**
Critical Thinking	think critically (S) address problems critically (S) use clinical reasoning (S) think abstractly (S) think holistically (S)
Analytical Thinking	think analytically (S) apply strategic thinking (S) think creatively (S) create new concepts (S)
Collaboration	collaborate with designers (S) collaborate through digital technologies (S) collaborate with stakeholders in leading community arts (S) liaise with colleagues (S) collaborate with choreographers (S) establish collaborative relations (S) collaborate with coaching team (S) teamwork principles (K) advise on drafting policies (S) develop design ideas cooperatively (S)
Project Management	project management (K) perform project management (S) Agile project management (K) project management methodology (PM^2) (K) customise project methodologies (S) ICT project management methodologies (K) manage project information (S) ICT project management (K) manage engineering project (S) manage several projects (S)
Time Management	manage time (S)

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	keep time accurately (S) use personal organization software (S) make time-critical decisions (S) work in an organised manner (S)

It is important to note that automated semantic matching algorithms rely on vector embeddings and mathematical proximity scores (such as cosine similarity percentages) between textual concepts, which may occasionally produce unexpected or counterintuitive matches. Because natural language processing models evaluate semantic overlap based on word usage contexts rather than domain-specific pedagogical nuances, automated scoring alone may align terms that share linguistic characteristics but differ in professional application. To mitigate these limitations and ensure the validity of the mapped skills, a expert human review was conducted. This qualitative verification step enabled the research team to contextualize the algorithmic outputs, refine potential discrepancies, and confirm that only genuinely relevant ESCO skills and knowledge items were incorporated into the final core competence framework.

5.3.4 Relevant ESCO Occupations

In order to identify occupations relevant to the Data Journalist profile, the ESCO classification system was examined. The analysis showed that the Data Journalist profile is primarily associated with the occupational group **2642 – Journalists**.

By reviewing all occupations included within these two ESCO groups, a total of **18 occupational profiles** were identified as relevant to the Data Journalist domain. These occupations are presented in Table 18.

Table 18 ESCO ocupaciones group 2642

ESCO code	ESCO Occupation
2642.1	journalist
2642.1.1	blogger
2642.1.10	fact checker
2642.1.11	foreign correspondent
2642.1.12	magazine editor
2642.1.13	newspaper editor
2642.1.14	picture editor
2642.1.15	political journalist
2642.1.16	sports journalist
2642.1.17	vlogger
2642.1.2	broadcast news editor
2642.1.3	business journalist
2642.1.4	columnist
2642.1.5	copy editor
2642.1.6	crime journalist
2642.1.7	critic
2642.1.8	editor-in-chief
2642.1.9	entertainment journalist

Furthermore, all skills linked to these 18 occupational profiles in ESCO were extracted and consolidated. After removing duplicates, a total of 186 unique skills and knowledge examples were identified. These skills represent the combined competence base associated with the

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selected occupations and are presented in Table 19. The full table could be found in Zenodo repository.

Table 19 ESCO S/K linked to occupations 2642 (Table 18)

ESCO S/K
adapt to changing situations
adapt to type of media
address problems critically
analyse market financial trends
analyse trends in the food and beverage industries
apply desktop publishing techniques
ask questions at events
attend book fairs
⋮

The extracted occupations and skills provide a comprehensive representation of the professional requirements and competency framework surrounding the Data Journalist profile, serving as an important foundation for subsequent skills analysis and curriculum development activities.

5.4 Competences of Data Journalism and Data Communication for the labour market.

Understanding labour market demand is a crucial step in validating and refining the Data Journalist profile. While occupational frameworks such as ESCO provide a structured view of occupations and their associated skills, labour market intelligence offers evidence of the skills, competencies, and qualifications that employers currently seek in practice. Analysing labour market data helps bridge the gap between occupational standards and real-world workforce needs, ensuring that the resulting profile reflects current and emerging trends within the profession.

To obtain these insights, labour market information was collected from two complementary European data sources: OVATE and EURES. These sources provide access to large-scale job vacancy data and employment opportunities across European countries, enabling the identification of demanded skills, occupations, and labour market trends related to data journalism and associated professional roles. The findings derived from these sources contribute to a more evidence-based understanding of the competencies required in the labour market and support the development of a skills profile that is aligned with industry needs.

5.4.1 OVATE

The Online Vacancy Analysis Tool for Europe (OVATE) is a labour market intelligence platform developed by European Centre for the Development of Vocational Training (Cedefop[7]). It provides access to large-scale online job advertisement (OJA) data collected from multiple European countries and offers valuable insights into labour market demand, occupations, skills, and emerging employment trends. The platform is based on the analysis of approximately 7–8

[7] https://www.cedefop.europa.eu/en

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million online job advertisements, making it one of the most comprehensive sources of labour market intelligence currently available in Europe.

OVATE is regularly updated to reflect changes in labour market demand and emerging occupational trends. The platform allows users to explore data through interactive dashboards and visualisations, while the underlying datasets can be downloaded in formats such as CSV and Tableau, facilitating further analysis and integration into research activities.

Among other indicators, OVATE provides information on:

- Occupations and occupational groups (based on ISCO classification);
- Most requested skills and knowledge areas;
- Labour market demand trends;
- Geographical distribution of vacancies;
- Educational and qualification requirements;
- Cross-country comparisons of occupations and skills;
- Emerging and declining skill needs.

Despite its value as a labour market intelligence source, one important limitation was identified for the purposes of this study. OVATE provides occupational information only up to ISCO Group Level 3. Consequently, occupational categories are often relatively broad and encompass several related professions. For example, journalists are included within ISCO Group 264 – Authors, Journalists and Linguists. As a result, the skills and knowledge identified by OVATE for this occupational group are not exclusively associated with journalists and may also reflect requirements from other professions included in the same category.

Therefore, although OVATE provides useful indications regarding labour market trends, it cannot be considered a fully reliable source for identifying the specific skills demanded by employers for the specialised profile of Data Journalist. Any conclusions derived from OVATE should therefore be complemented by other sources, such as the competency analysis, survey results, and expert interviews conducted within this project.

Nevertheless, the analysis of OVATE data provides several useful insights regarding the transversal skills most frequently requested within ISCO Group 264. The most requested ESCO Level 3 skill group is Personal Skills and Development, appearing in 72.4% of online job advertisements within the occupational category. Within this domain, the most frequently requested skills include:

- Demonstrating willingness to learn (66.6%)
- Collaborating in teams and networks (65.4%)
- Working efficiently (54.7%)

These percentages represent the proportion of online job advertisements containing at least one skill belonging to the ESCO Level 3 category *Personal Skills and Development*.

Although these skills are not specific to Data Journalism, they highlight the importance of transferable and transversal competences in contemporary media and communication professions. Consequently, they may be considered essential soft skills for professionals working in DJDC, complementing the technical, analytical, and journalistic competencies identified throughout this study. It should be noted that these 4 skills could be categorized under Professional & Collaborative Skills group that we already created (Table 7).

5.4.2 EURES

Another valuable European source of labour market information is the European Employment Services (EURES) platform. EURES is a European initiative that facilitates labour mobility across

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European countries and provides access to a large database of employment opportunities, containing more than 2 million active job advertisements at any given time. Compared with aggregated labour market intelligence platforms, EURES offers direct access to individual job advertisements published by employers, making it a potentially valuable source for identifying current labour market requirements and skill demands.

One of the main advantages of analysing EURES data is that job advertisements often contain detailed information about the position being offered, including job descriptions, required qualifications, educational requirements, professional experience, language requirements, and, in some cases, explicitly specified skills and competences. Consequently, EURES can provide a more direct view of employer expectations and recruitment needs than broader occupational statistics.

For the purposes of this study, job advertisements related to the occupation Journalist were extracted, scraped, and analysed. At the time of writing this report, a total of 1,354 job advertisements associated with journalism-related occupations were identified on the EURES platform.

The extracted advertisements contained various types of information, including:

- Job descriptions and responsibilities;
- Required educational qualifications;
- Required professional experience;
- Language requirements;
- Skills and competences;
- Employment conditions and contract information.

However, an important limitation was identified during the analysis. Although the EURES platform allows employers to specify required skills directly when creating a job advertisement, this information is entered manually and is therefore optional. As a result, only 59 out of the 1,354 analysed job advertisements contained explicitly defined skills provided by employers.

This limitation significantly reduces the representativeness of the skill-related information available through EURES for the journalist profile. Consequently, the extracted skills cannot be considered a complete representation of labour market demand but rather an indicative sample of competencies explicitly highlighted by employers.

Nevertheless, the skills associated with these 59 job advertisements were extracted and analysed. By aggregating and counting the occurrence of individual skills, it was possible to identify the competences most frequently requested by employers within this subset of vacancies.

A total of 238 unique skills were identified and extracted. Table 19 presents the skills with the highest frequency of occurrence among the analysed job advertisements. Although the sample size is relatively limited, these results provide useful complementary evidence regarding employer expectations and can be compared with the competency framework developed through the desk research, survey analysis, and expert interviews. Such triangulation contributes to a more comprehensive understanding of the skills required for professionals working in DJDC.

Table 20 Number of repetitions of ESCO skills (connected to occupation group 2642) in EURES

Row Labels	Number of repetitions in EURES
social media marketing techniques	22
public relations	21
perform public relations	20

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editorial standards	17
create editorial board	16
carry out internet research	15
participate in editorial meetings	14
search for information online	14
follow ethical code of conduct of journalists	13
journalism	13
journalistic principles	13
check correctness of information	12
⋮	⋮

A more detailed analysis of the 238 skills extracted from the EURES job advertisements reveals that these skills can be effectively classified according to the competence domains previously defined in Section 5.2, Table 7. For example, Table 21 presents a sample of this categorisation, illustrating how individual skills can be mapped to the corresponding competence groups.

Table 21 Categorization of extracted skills from EURES OJAs

Categories of Skills	**Extracted skills from EURES OJAs**
AI & Emerging Technologies	build recommender systems, cloud technologies, computer programming, Java (computer programming), utilise machine learning, ⋯
Business & Strategy	social media marketing techniques, conduct mobile marketing, mobile marketing, adapt to change in marketing, apply social media marketing, channel marketing, create annual marketing budget, ⋯
Communication & Storytelling	public relations, perform public relations, draft press releases, develop communication strategies, use specific writing techniques, manage online communications, provide support to authors, ⋯
Data & Analytics	conduct scholarly research, search databases, browse, search and filter data, information and digital content, interpret aerial photos of timber, prepare well data sheets, ⋯
Data Journalism & Investigation	editorial standards, carry out internet research, search for information online, journalism, check correctness of information, consult information sources, study topics, ⋯
Digital Media & Tools	use content management system software, manage online content, use microsoft office, provide technical documentation, social media management, use internet chat, ⋯
Media, Ethics & Governance	create editorial board, journalistic principles, data protection, organisational policies, prepare compliance documents, press law, ⋯
Professional & Collaborative Skills	participate in editorial meetings, Agile development, Incremental development, Iterative development, perform project management, project management, ⋯
Visualization & Content Production	prepare presentation material, create online news content, perform image editing, photography, provide multimedia content, perform video editing, assemble video tape footage, ⋯

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This classification exercise provides further evidence that the competence domains developed in the earlier stages of the study offer a comprehensive and coherent framework for organising the skills required in the field. In other words, the results suggest that the proposed competence domains adequately cover the range of skills identified in real labour market demands, thereby supporting the validity and robustness of the competency framework developed for the DJDC professional profile.

5.5 Survey Analysis

In this section, we present and analyse the results obtained from the survey described in Sections 2.2 and 3.2. The purpose of the survey was to validate the competency framework developed during the desk research phase and to gather feedback from stakeholders regarding the importance and relevance of the identified competence domains for the DJDC professional profile.

5.5.1 Analysis of Participants

The survey was available between 18th May and 15th June and was distributed through the DAPHnE consortium network. In total, **158 participants** completed the questionnaire, representing a diverse range of countries, organisations, and professional backgrounds. This diversity contributes to the reliability of the results and ensures that the findings reflect perspectives from different sectors, including Higher Education (HE), Vocational Education and Training (VET), media organisations, researchers, public institutions, industry representatives, and independent professionals.

Figure 5 presents the geographical distribution of respondents by country. The results demonstrate a broad international participation, reflecting the European scope of the project and providing valuable insights from different educational, professional, and cultural contexts.

Country		Answers
Portugal - PT		49
Italy - IT		42
Spain - ES		34
Greece - GR		21
Non-EU Country - NON-EU		4
France - FR		3
Czech Republic - CZ		1
Estonia - EE		1
Germany - DE		1
Ireland - IE		1
Lithuania - LT		1

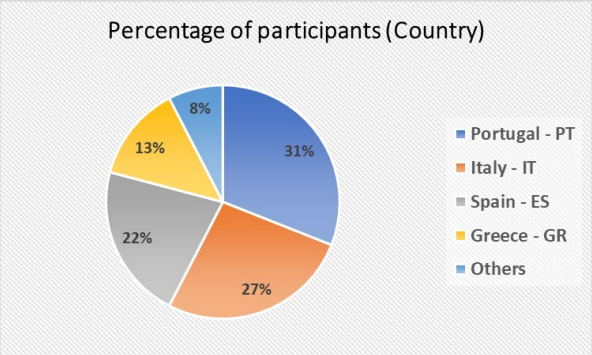


Figure 5 Participants of the survey (country distribution)

In addition to country distribution, respondents were asked to indicate the stakeholder group they represented. Figure 6 presents the distribution of participants according to stakeholder type, both in terms of absolute numbers and percentages. This analysis provides an overview of the composition of the respondent sample and facilitates the interpretation of the survey results according to the perspectives represented within the study.

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Stakeholder		Answers
Higher Education Institution (HEI)		41
Student / Learner		25
Journalist / Data Journalist		24
Media Organisation / Newsroom		15
Research Organisation / Researcher		10
NGO / Civil Society Organisation		9
Communication or Media Professional		7
Vocational Education and Training (VET) Provider		4
Private Sector / Industry		4
Technology or Digital Solutions Provider		4
Freelancer / Independent Expert		4
Trainer / Educator		4
Public Sector / Government Institution		3
Other (please specify)		3
Policy Maker		1
No Answer		0

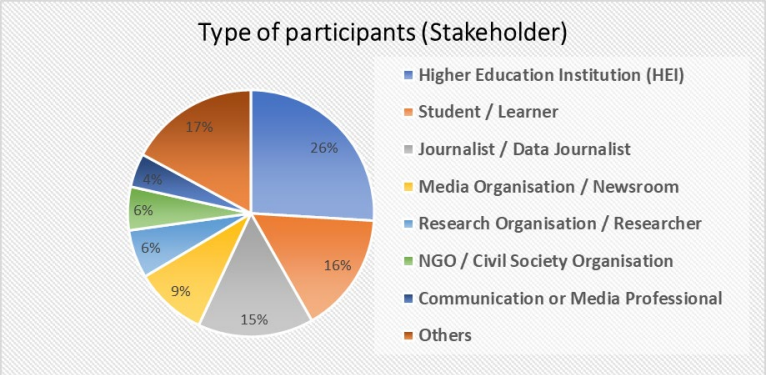


Figure 6 Type of participants

To assess the level of expertise of the respondents, participants were also asked to indicate their familiarity with DJDC using a scale ranging from 0 (Not familiar at all) to 5 (Very familiar). This indicator is particularly important for evaluating the credibility and relevance of the responses, as it provides an indication of the respondents' experience and knowledge of the field.

The results (Figure 7) show that the majority of participants reported a medium to high level of familiarity with DJDC, suggesting that the survey successfully reached stakeholders with relevant expertise and professional experience. Consequently, the responses can be considered a valuable source of evidence for validating the competency framework and identifying the skills and competence areas considered most important by the community of practice.

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Familiarity with Data Journalism and Data Communication			
		Answers	Ratio
0		9	6%
1		15	9%
2		18	11%
3		35	22%
4		41	26%
5		40	25%
N/A		0	0%

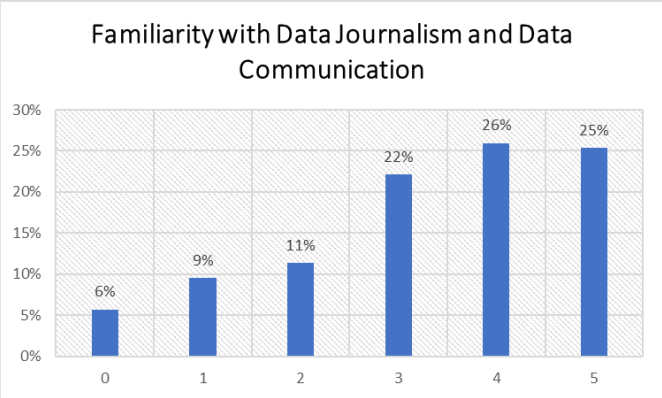


Figure 7 Familiarity with DJDC

The following subsection present a detailed analysis of the responses regarding the importance, prioritisation, and future relevance of the identified competence domains. These findings are subsequently compared with the results obtained through desk research, ESCO mapping, labour market analysis, and expert interviews in order to develop a comprehensive competency profile for DJDC.

5.5.2 Analysis of Results

Regarding the question:

"In your experience, which of the following skill groups are most important for professionals working in the scope of Data Journalism and Data Communication?"

Participants were asked to evaluate each competence domain using a scale ranging from 0 (Not Important) to 5 (Very Important)**.** The results presented in Figure 8 to Figure 16 provide valuable insights into stakeholders' perceptions regarding the relative importance of the competence domains identified during the desk research phase.

As shown in Figure 8, **Data & Analytics** is considered one of the most important competence domains for DJDC professionals. A total of **58%** of respondents rated this domain as **Very Important (5)**, while an additional **25%** assigned a score of **4**. Therefore, **83%** of respondents evaluated this competence area with one of the two highest ratings.

Only **5%** of respondents assigned scores of 0, 1, or 2, indicating a very strong consensus regarding the central role of data-related competencies. These results confirm that abilities such as data collection, processing, interpretation, and analysis constitute a fundamental component of the professional profile.

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Data & Analytics	Answers	Ratio
0	0	0%
1	1	1%
2	7	4%
3	19	12%
4	39	25%
5	92	58%
N/A	0	0%

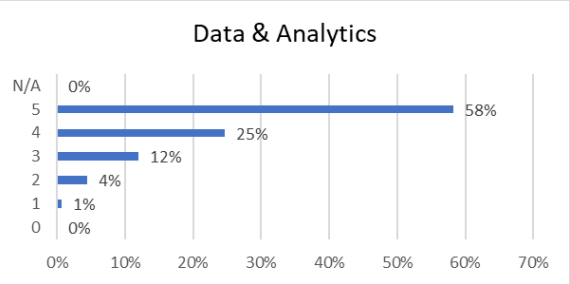


Figure 8 Survey results regarding Data & Analytics category

Figure 9 shows that **Data Journalism & Investigation** received the highest level of support among all competence domains. **62%** of respondents rated this domain as **Very Important (5)**, while **24%** assigned a score of **4**. Consequently, **86%** of participants considered this competence area highly important.

The very low proportion of low ratings further demonstrates the perceived importance of investigative methodologies, fact-checking, research skills, and evidence-based journalism practices. These findings strongly support the inclusion of this domain as a core pillar of the competency framework.

Data Journalism & Investigation	Answers	Ratio
0	1	1%
1	1	1%
2	6	4%
3	13	8%
4	38	24%
5	98	62%
N/A	1	1%

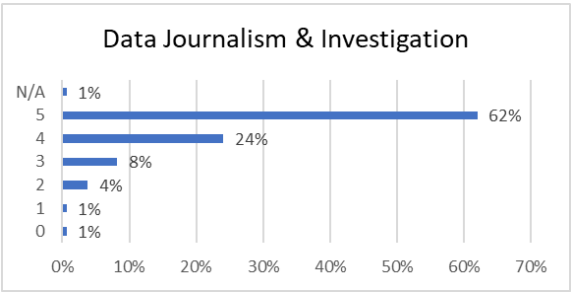


Figure 9 Survey results regarding Data Journalism & Investigation category

According to Figure 12, **Communication & Storytelling** is also perceived as a highly relevant competence area. Nearly half of respondents (**47%**) assigned the maximum rating, while **31%** selected a score of **4**.

Overall, **78%** of participants rated this competence domain as highly important. These results highlight the critical role of transforming data into meaningful narratives and communicating complex information effectively to different audiences. The findings confirm that technical data skills alone are insufficient without the ability to communicate insights clearly and persuasively.

Communication & Storytelling	Answers	Ratio
0	0	0%
1	1	1%
2	9	6%
3	22	14%
4	49	31%
5	74	47%
N/A	3	2%

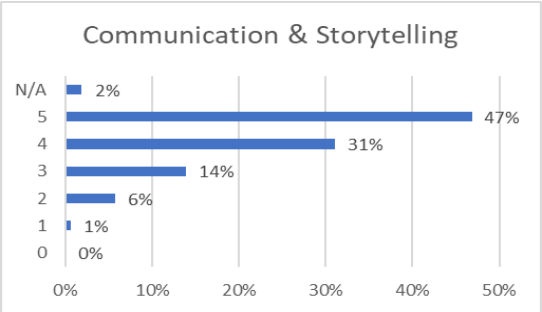


Figure 10 Survey results regarding Communication & Storytelling category

As shown in Figure 11, **Visualization & Content Production** received similarly strong support. A total of **42%** of respondents rated this domain as **Very Important (5)**, while **31%** assigned a score of **4**.

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The combined result of **73%** of respondents selecting the two highest ratings indicates that data visualization, information design, and content production are considered essential components of DJDC. These skills are particularly important for improving audience engagement and enhancing the accessibility of data-driven stories.

Visualization & Content Production	Answers	Ratio
0	0	0%
1	1	1%
2	10	6%
3	29	18%
4	49	31%
5	67	42%
N/A	2	1%

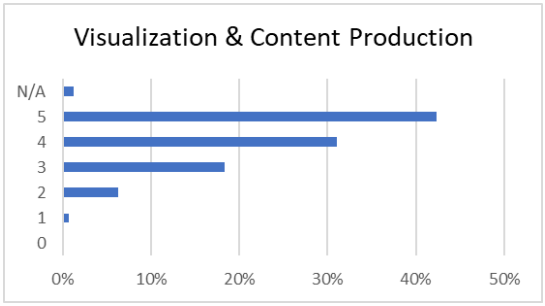


Figure 11 Figure 10 Survey results regarding Visualization & Content Production category

Figure 12 presents the results for **Digital Media & Tools**. Although this competence domain remains highly valued, respondents assigned slightly lower ratings compared with the previous categories. **30%** rated the domain as **Very Important (5)** and **36%** selected **4**.

Together, **66%** of respondents assigned one of the two highest ratings, indicating that digital literacy, digital workflows, and the use of digital tools are important enabling competencies for professionals in the field. However, respondents appear to consider them somewhat less critical than core data, journalistic, and communication-related competencies.

Digital Media & Tools	Answers	Ratio
0	0	0%
1	3	2%
2	13	8%
3	35	22%
4	57	36%
5	47	30%
N/A	3	2%

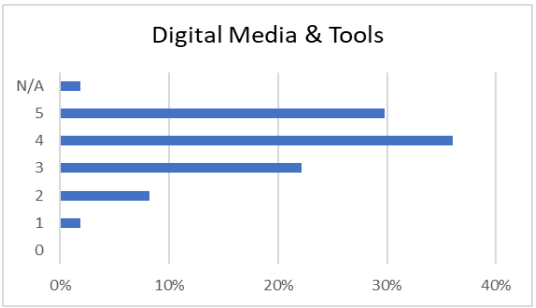


Figure 12 Survey results regarding Digital Media & Tools category

As illustrated in Figure 13, **AI & Emerging Technologies** received a more balanced distribution of responses. **28%** of respondents selected the maximum score, while **34%** assigned a rating of **4**.

Although only **62%** of respondents evaluated this competence area with the two highest scores, the results remain significant. The findings suggest that artificial intelligence, machine learning, and emerging technologies are increasingly recognised as important competencies, although they have not yet reached the same level of perceived importance as traditional data journalism, analytical, or communication skills.

This result may reflect the relatively recent integration of AI technologies into journalistic and communication workflows and the ongoing evolution of best practices in this area.

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AI & Emerging Technologies	Answers	Ratio
0	1	1%
1	7	4%
2	17	11%
3	34	22%
4	54	34%
5	44	28%
N/A	1	1%

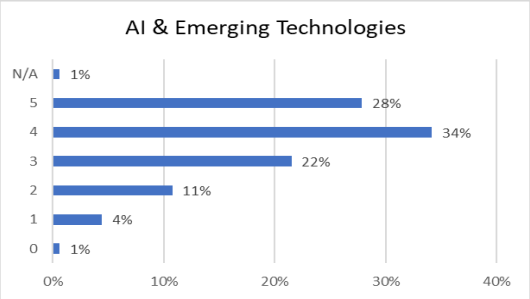


Figure 13 Survey results regarding AI & Emerging Technologies category

Figure 14 demonstrates strong support for the **Media, Ethics & Governance** domain. **42%** of respondents assigned a score of **5**, while **34%** selected **4**, resulting in **76%** of participants rating this domain as highly important.

These findings highlight the growing importance of ethical considerations in data-driven communication, including data privacy, transparency, responsible AI usage, media law, and journalistic ethics. The results confirm that technical competence must be accompanied by ethical awareness and professional responsibility.

Media, Ethics & Governance	Answers	Ratio
0	1	1%
1	1	1%
2	11	7%
3	24	15%
4	54	34%
5	66	42%
N/A	1	1%

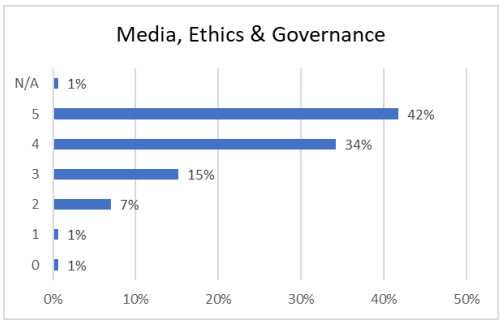


Figure 14 Survey results regarding Media, Ethics & Governance category

As shown in Figure 17, **Business & Strategy** received the lowest ratings among all competence domains. Only **18%** of respondents selected the highest score, while **25%** assigned a rating of **4**.

Although **43%** of respondents still considered this competence area highly important, the results indicate that business-related competencies are perceived as less critical than the technical, analytical, journalistic, and communication skills that define the profession. Nevertheless, the relatively large proportion of respondents assigning moderate scores suggests that business awareness remains a relevant supporting competence within contemporary media environments.

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Business & Strategy	Answers	Ratio
0	1	1%
1	20	13%
2	23	15%
3	46	29%
4	39	25%
5	29	18%
N/A	0	0%

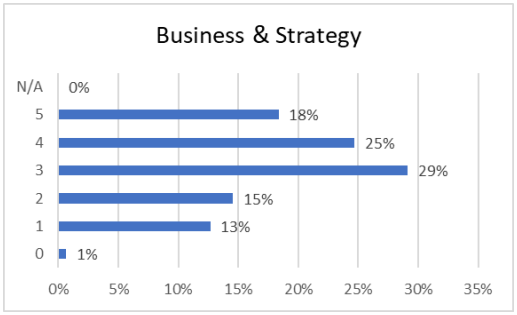


Figure 15 Survey results regarding Business & Strategy category

And finally, Figure 18 presents the results for **Professional & Collaborative Skills**. This domain received very positive evaluations, with **43%** of respondents assigning the highest rating and **25%** selecting a score of **4**.

Overall, **68%** of respondents considered this competence area highly important. These results highlight the importance of transversal skills such as critical thinking, teamwork, communication, adaptability, and project management. The findings suggest that employers and professionals increasingly value soft skills alongside technical competencies.

Professional & Collaborative Skills	Answers	Ratio
0	0	0%
1	3	2%
2	10	6%
3	37	23%
4	39	25%
5	68	43%
N/A	1	1%

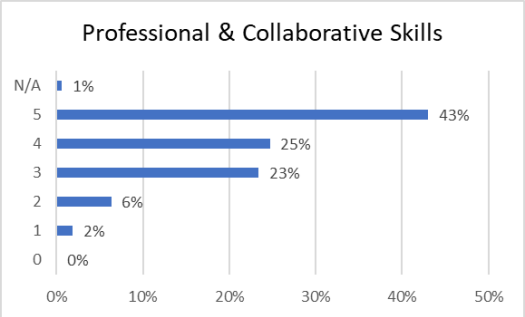


Figure 16 Survey results regarding Professional & Collaborative Skills category

5.5.3 Overall Findings

The survey results provide strong evidence supporting the competency framework developed during the desk research phase. All nine competence domains received generally positive evaluations, indicating broad stakeholder agreement regarding their relevance to the DJDC professional profile.

The highest-rated competence domains were:

1. **Data Journalism & Investigation** (86% rating 4 or 5)
2. **Data & Analytics** (83%)
3. **Communication & Storytelling** (78%)
4. **Media, Ethics & Governance** (76%)
5. **Visualization & Content Production** (73%)

These findings suggest that stakeholders primarily view DJDC as a multidisciplinary profession built upon three interconnected pillars: **data competencies**, **journalistic and investigative practices**, and **effective communication of information**.

At the same time, the strong evaluations received by **Media, Ethics & Governance** and **Professional & Collaborative Skills** demonstrate that respondents recognise the importance of ethical responsibility and transversal competences in addition to technical expertise.

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Although **AI & Emerging Technologies** and **Business & Strategy** received comparatively lower ratings, both domains were still considered relevant by a substantial proportion of respondents, indicating their growing importance within the evolving media ecosystem.

Overall, the survey results strongly validate the competence domains identified through the desk research and support their use as the foundation for the DJDC competency framework developed within the DAPHnE project.

In addition to evaluating the importance of each competence domain individually, respondents were asked to rank the nine competence groups according to their overall importance for the DJDC professional profile. To facilitate interpretation, the rankings were converted into scores, where the most important competence group received **9 points** and the least important received **1 point**. The average score for each competence domain was then calculated and the results were sorted in descending order.

The results (Figure 17) reveal a clear hierarchy of competencies perceived as most relevant for professionals working in DJDC.

Skill Group	Score
Data Journalism & Investigation (Data Journalism, Fact-Checking, Research Skills, Freedom of Information (FOI), etc.)	7.63
Data & Analytics (Data Analysis, Data Collection, Data Processing, Data Interpretation, etc.)	7.4
Communication & Storytelling (Data Storytelling, Communication, Digital Communication, Journalism Writing. etc.)	6.22
Visualization & Content Production (Data Visualization, Information Design, Content Creation, etc.)	5.42
Media, Ethics & Governance (Data Ethics, Data Privacy, Media Law & Ethics, Journalism Fundamentals, etc.)	4.29
Digital Media & Tools (Digital Journalism, Digital Literacy, Digital Workflow, Digital Tools, etc.)	4.22
AI & Emerging Technologies (Artificial Intelligence, Ethical AI, Machine Learning, etc.)	3.87
Professional & Collaborative Skills (Critical Thinking, Analytical Thinking, Collaboration, Project Management, etc.)	3.84
Business & Strategy (Journalism Business Models, Digital Advertising, Media Trends, Content Strategy, etc.)	2.05

Figure 17 Importance of the skill groups according to participants' perspective

The highest-ranked competence domain was **Data Journalism & Investigation**, with an average score of **7.63**. This result highlights the central role of journalistic investigation, fact-checking, research skills, and evidence-based reporting within the profession. Respondents clearly perceive the ability to discover, verify, and investigate data-driven stories as the defining characteristic of the profile.

Closely following in second place is **Data & Analytics**, with an average score of **7.40**. This finding confirms that technical data-related competencies—including data collection, processing, analysis, and interpretation—constitute a fundamental pillar of the profession. Together, the top two domains indicate that stakeholders view DJDC as a discipline that combines rigorous journalistic practices with strong analytical capabilities.

The third-ranked domain is **Communication & Storytelling** (6.22). Although it scores noticeably lower than the two leading categories, it remains significantly ahead of the remaining competence groups. This result suggests that the ability to transform data into understandable and engaging narratives is considered a key differentiating competence for professionals working in the field.

The fourth position is occupied by **Visualization & Content Production** (5.42). Respondents recognise that effective visual communication is an essential component of data-driven storytelling, enabling complex information to be communicated more clearly and effectively to diverse audiences.

A second tier of competence domains emerges in the middle of the ranking. **Media, Ethics & Governance** (4.29) and **Digital Media & Tools** (4.22) receive very similar scores, indicating that respondents consider ethical awareness, data privacy, media regulations, and digital literacy to

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be important supporting competencies. While not perceived as core differentiators of the profession, these competencies are viewed as necessary enablers of professional practice.

Interestingly, **AI & Emerging Technologies** (3.87) occupies a relatively modest position despite the growing influence of artificial intelligence within journalism and communication. This result may indicate that stakeholders recognise the future importance of AI while still considering traditional journalistic, analytical, and communication competencies to be more critical at present.

Similarly, **Professional & Collaborative Skills** (3.84) receive a moderate ranking. While respondents acknowledge the value of critical thinking, teamwork, and project management, these skills appear to be regarded as transversal competencies that support professional performance rather than defining the profession itself.

Finally, **Business & Strategy** receives the lowest average score (**2.05**), significantly below all other competence domains. This suggests that respondents perceive business-related competencies, such as media business models, digital advertising, and content strategy, as less central to the professional identity of DJDC practitioners. Nevertheless, these competencies may still be relevant in managerial, entrepreneurial, or organisational contexts.

Overall, the ranking results reinforce the findings obtained from Question 6 and provide a clearer picture of stakeholder priorities. The results suggest that the DJDC profile is primarily built upon three core pillars: **Data Journalism & Investigation**, **Data & Analytics**, and **Communication & Storytelling**. These are complemented by visualization, ethical, digital, and emerging technology competencies, while business-related skills are generally perceived as having a supporting rather than central role. Consequently, the ranking exercise provides additional validation for the competency framework developed during the desk research phase and confirms the relevance of the proposed competence domains.

Regarding the final open-ended question (*"Are there any additional groups or competence areas that you believe should be included…?"*), the majority of respondents indicated that no additional competence domains were necessary. In general, participants expressed the view that the nine proposed competence groups already provide a comprehensive and well-structured representation of the DJDC professional profile.

Only a limited number of respondents suggested additional or alternative competence areas. However, a closer examination of these suggestions shows that they can be effectively mapped to the existing nine competence domains defined in the framework, rather than requiring the introduction of new standalone categories.

For instance, one respondent proposed **"Data Privacy & Security Practices"** as an additional competence area. While this suggestion is relevant and reflects an important concern in contemporary data-driven environments, it is conceptually aligned with the **Media, Ethics & Governance** domain. This is because data privacy, information security, and responsible data handling are core components of media ethics and regulatory compliance in journalism. These aspects are already embedded in this domain, which covers ethical standards, legal frameworks, transparency, and responsible use of data in journalistic practice.

Another respondent suggested **"Software Development"** and **"Vibe Coding"** as additional competence areas. Although these skills reflect the increasing role of computational thinking and generative AI-assisted programming in modern workflows, they are most appropriately integrated into the **AI & Emerging Technologies** domain. This is because both software development and emerging AI-driven coding practices are strongly associated with the use, adaptation, and application of advanced digital technologies, including machine learning systems, generative AI tools, and computational methods for data processing and storytelling.

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Overall, these responses confirm that while stakeholders are aware of emerging and specialised skill sets, they generally perceive them as extensions or sub-components of the existing framework rather than entirely new competence domains. This further supports the robustness and completeness of the nine-domain structure developed within the study.

5.6 Interview Analysis

The final stage of the research consisted of conducting semi-structured interviews (see Annex 3 for the structure of the interview) with experts in the fields of Data Journalism, Data Communication, digital media, higher education, vocational education and training (VET), and related industries. As described in Section 3.3, the interview protocol was designed to validate the competency framework developed through the desk research, labour market analysis, and survey phases, while also collecting expert opinions on emerging trends, competency gaps, and future professional requirements.

Following the completion of the interviews by all project partners, the collected responses were analysed qualitatively. Particular attention was given to the experts' opinions regarding the proposed competence domains and core competences, their perceived importance, possible missing competencies, and recommendations for refining the professional profile. The following subsections present the main findings obtained from the interview analysis.

5.6.1 Analysis of Section 1: Interviewee Profile

A total of **28 experts** participated in the interview phase, representing a broad range of professional backgrounds and organisations across **Greece, Germany, Spain, Italy, and Portugal**. The diversity of interviewees ensured that the competency framework was evaluated from multiple perspectives, including journalism practice, academia, vocational education, public institutions, non-governmental organisations, digital media, and the private sector.

The sample included professionals working in leading **news organisations**, **universities**, **VET providers**, **NGOs**, **government institutions**, and **technology companies**, providing a balanced representation of both the education and labour market sectors. Interviewees occupied senior and highly specialised positions, including senior media advisors, heads of data journalism teams, data journalists, investigative journalists, university lecturers, communication managers, open data experts, AI specialists, senior editors, and digital humanities professionals.

The participants demonstrated extensive expertise in the areas addressed by this study. Most interviewees reported professional experience in one or more of the following fields:

- Data Journalism;
- Investigative Journalism;
- Data Analysis;
- Data Visualization;
- Digital Media;
- Communication;
- Artificial Intelligence in Journalism.

Several interviewees possessed expertise spanning multiple domains, reflecting the multidisciplinary nature of DJDC. This diversity of expertise enabled the competency framework to be evaluated from both technical and journalistic perspectives, as well as from educational and organisational viewpoints.

The interview sample also represented a high level of professional maturity. More than half of the participants reported **over 15 years of professional experience**, with several experts having

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more than 20 years of experience in journalism, communication, higher education, or digital technologies. The remaining interviewees generally possessed between **6 and 15 years** of relevant professional experience, ensuring that the study captured both long-established professional perspectives and insights from practitioners actively engaged with contemporary technologies and workflows.

From a sectoral perspective, the participants represented a balanced distribution across **news media organisations**, **higher education institutions**, **vocational education and training providers**, **non-governmental organisations**, **government institutions**, and the **private sector**. This multidisciplinary composition was particularly valuable, as one of the primary objectives of the DAPHnE project is to develop a competency framework that is applicable across educational pathways and responsive to labour market needs.

5.6.2 Analysis of Section 2: Competency Importance Assessment

The second section of the interviews aimed to validate the competency framework developed during the previous phases of this research. Specifically, interviewees were asked to evaluate the proposed competence domains and provide their opinions on whether any competency groups should be added, removed, merged, renamed, or further refined. They were also invited to identify any additional competencies that they considered important for the DJDC professional profile.

Overall, the interviews demonstrate a strong consensus regarding the proposed competency framework. The vast majority of experts agreed that the nine competence domains collectively provide a comprehensive representation of the knowledge, skills, and abilities required for professionals working in DJDC. Most participants considered the framework to be well balanced and sufficiently broad to cover both the journalistic and technical dimensions of the profession. Only limited refinements were suggested, primarily concerning the relative importance of certain competence domains and the inclusion of a small number of additional competencies rather than fundamental structural changes.

One of the most recurrent observations concerned the growing importance of **Artificial Intelligence and Emerging Technologies**. Several experts argued that AI should receive greater emphasis within the framework due to its increasing influence on data collection, analysis, content generation, visualization, automation, and investigative workflows. They highlighted that AI has become an indispensable tool for modern data journalists, particularly for professionals coming from journalism or humanities backgrounds who increasingly rely on AI-assisted tools to analyse data, automate repetitive tasks, and create visual stories more efficiently. Consequently, while experts strongly supported retaining AI as a separate competence domain, many recommended assigning it a higher priority within the overall competency framework.

Another recurring theme concerned the relationship between technical and journalistic competencies. Interviewees consistently emphasised that Data Journalism should not be viewed solely as a technical discipline. Instead, successful professionals require a balanced combination of analytical, technological, investigative, communication, and ethical competencies. Several experts described the profession as being built upon two complementary pillars: technical capabilities related to data processing and analysis, and journalistic capabilities related to investigation, storytelling, communication, and public accountability. These competencies were considered complementary rather than competing, reinforcing the multidisciplinary nature of the proposed framework.

Although the overall structure received broad support, several interviewees recommended clarifying the distinction between **Data Journalism** and **Investigative Journalism**. They noted

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that while the two fields frequently overlap, they represent different professional practices. Data journalism primarily focuses on collecting, cleaning, analysing, interpreting, and visualising datasets to produce evidence-based stories, whereas investigative journalism additionally depends on source development, field reporting, long-term domain expertise, document analysis, and contextual knowledge. Rather than proposing a new competence domain, experts suggested making this distinction more explicit within the descriptions of the corresponding core competencies.

Some interviewees also recommended strengthening several existing core competencies. Among the most frequently mentioned were **Data Interpretation**, **Domain Knowledge**, **Contextual Expertise**, and **Lateral Thinking**. These competencies were viewed as essential for transforming data into meaningful journalistic insights, interpreting findings within their broader social and political contexts, and identifying unexpected relationships across multiple datasets. Importantly, experts generally considered these competencies to fit naturally within the existing competence domains rather than requiring the creation of additional categories.

Ethics was another topic consistently highlighted throughout the interviews. Participants stressed that competencies related to data privacy, statistical confidentiality, responsible use of AI, media credibility, transparency, and ethical decision-making are becoming increasingly important as journalists work with larger, more sensitive, and AI-generated datasets. Rather than treating ethics as an isolated subject, experts viewed ethical considerations as a cross-cutting dimension that should inform all stages of the data journalism workflow, from data collection to publication.

The **Business & Strategy** competence domain generated more diverse opinions than the other domains. Some participants considered it to be less relevant for journalists working in traditional newsrooms, while others argued that business knowledge is becoming increasingly important, particularly for freelance journalists, entrepreneurs, independent media organisations, newsletters, and data-driven digital products. Despite these differences, most experts agreed that the domain should remain within the framework, even if its relative importance may vary depending on the professional context.

Finally, very few experts recommended merging competence domains. While some suggested that **Digital Media & Tools** and **AI & Emerging Technologies** could be combined because of their close technological relationship, or that **Communication & Storytelling** could be integrated with **Visualization & Content Production**, the majority preferred to retain the current structure. They argued that maintaining separate competence domains improves clarity, facilitates curriculum design, and allows educational providers to define more precise learning outcomes while still recognising the strong interconnections between the different domains.

Overall, the interview findings provide strong validation for the competency framework developed throughout this research. The experts overwhelmingly agreed that the proposed nine competence domains accurately capture the multidisciplinary nature of the DJDC profession. The suggested improvements mainly concern refining the descriptions of certain competencies, strengthening the role of AI and emerging technologies, further emphasising ethical and contextual competencies, and clarifying the boundaries between closely related professional practices, rather than introducing substantial modifications to the overall competency model.

Following the qualitative discussion on the competency framework, interviewees were also asked to rank the nine competence domains from **1 (most important)** to **9 (least important)** according to their professional experience. The average ranking for each competence domain is presented in Table 23.

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Table 22 Importance of Competency domains

Competence Domain	Average
Data Journalism & Investigation	2.3
Data & Analytics	2.7
AI & Emerging Technologies	4.4
Visualization & Content Production	4.5
Communication & Storytelling	4.8
Digital Media & Tools	5.9
Media, Ethics & Governance	6.1
Professional & Collaborative Skills	6.7
Business & Strategy	7.2

The results reveal a clear consensus regarding the competencies that constitute the core of the DJDC profession. **Data Journalism & Investigation** achieved the highest priority, with the lowest average ranking (**2.3**), indicating that experts consider investigative and journalistic competencies to be the defining characteristics of the profession. This finding is consistent with both the survey results and the literature review, which identified investigation, fact-checking, and evidence-based reporting as fundamental capabilities for data journalists.

Closely following is **Data & Analytics**, with an average ranking of **2.7**. Experts consistently emphasized that the ability to collect, process, analyse, interpret, and verify data forms the technical foundation upon which data-driven journalism is built. Together, these two domains clearly emerge as the two fundamental pillars of the professional profile.

Interestingly, **AI & Emerging Technologies** ranked third (**4.4**), considerably higher than in the previous survey conducted among a broader group of stakeholders. This result suggests that experienced professionals perceive artificial intelligence as becoming increasingly central to journalistic practice. During the interviews, several experts highlighted AI's growing role in data collection, analysis, automation, content generation, visualization, and investigative workflows, arguing that future professionals will require a solid understanding of AI technologies in addition to traditional journalistic competencies.

The next three competence domains—**Visualization & Content Production** (**4.5**), **Communication & Storytelling** (**4.8**), and **Digital Media & Tools** (**5.9**)—received intermediate rankings. Their relatively similar scores indicate that experts view these competencies as complementary capabilities that enable journalists to transform analytical findings into accessible, engaging, and impactful stories for diverse audiences. Although these competencies are not considered as fundamental as investigation or data analysis, they remain essential for effectively communicating data-driven insights.

Media, Ethics & Governance obtained an average ranking of **6.1**. While this domain did not appear among the highest-ranked competencies, interviewees consistently stressed throughout the qualitative discussions that ethical principles, transparency, data privacy, and responsible use of information underpin all stages of the journalistic process. Therefore, its relatively lower ranking should not be interpreted as reduced importance, but rather as evidence that experts perceive ethical competencies as transversal skills that support all other competence domains.

Similarly, **Professional & Collaborative Skills** received an average ranking of **6.7**. Competencies such as critical thinking, collaboration, project management, and analytical reasoning were widely recognised as essential for successful professional practice. However, participants generally viewed these competencies as transferable skills applicable across many professions rather than as defining characteristics specific to DJDC.

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Finally, **Business & Strategy** received the highest average ranking (**7.2**), making it the lowest-priority competence domain according to the interviewees. Although several experts acknowledged the growing importance of business models, audience development, sustainability, and digital media strategy—particularly for freelance journalists and independent media initiatives—they generally regarded these competencies as supplementary rather than core requirements for the professional profile.

Overall, the ranking exercise demonstrates a high level of consistency with the findings obtained during the survey phase. Both analyses identify **Data Journalism & Investigation** and **Data & Analytics** as the two most critical competence domains for the profession. However, compared with the broader survey sample, the expert interviews place noticeably greater emphasis on **AI & Emerging Technologies**, reflecting professionals' awareness of the rapid transformation of journalism through AI-assisted tools and data-driven technologies. These findings further validate the competency framework developed in this study while highlighting emerging priorities that should be considered in future curriculum design and professional training programmes.

5.6.3 Analysis of Section 3: Professional Background

The third section of the interviews explored the experts' perspectives on the current state of DJDC and the competencies that are expected to become most important over the next three to five years. Rather than validating the existing competency framework, this section sought to identify emerging trends, technological developments, and evolving professional requirements that may influence future curricula and occupational profiles.

Overall, the interviews revealed a strong consensus that **Data Journalism is undergoing a profound transformation**, driven primarily by rapid advances in artificial intelligence, increasing data availability, automation technologies, and the growing complexity of digital information ecosystems. While interviewees agreed that the fundamental principles of journalism—such as investigation, verification, accuracy, transparency, and storytelling—remain unchanged, they consistently emphasised that the methods and technologies used to perform these tasks are evolving rapidly.
One of the most frequently discussed themes was the growing impact of **Artificial Intelligence** on professional practice. Experts described AI not merely as a productivity tool, but as a technology that is fundamentally changing how journalists discover stories, analyse data, write code, automate repetitive tasks, generate visualisations, and organise complex investigations. Many participants highlighted that AI enables journalists with limited programming backgrounds to perform technical tasks that previously required specialised software developers, thereby lowering technical barriers while simultaneously increasing the need for AI literacy and critical evaluation of AI-generated outputs.

Despite these technological advances, interviewees consistently argued that AI cannot replace journalistic judgement. Instead, they stressed that professionals must develop strong competencies in **verification**, ensuring that AI-generated analyses, code, summaries, and visualisations are systematically checked against original sources. Several experts considered verification of AI outputs to be one of the most important emerging competencies for future journalists, reflecting growing concerns regarding hallucinations, misinformation, algorithmic bias, and the reliability of automated content generation.

Another recurring observation concerned the increasing complexity of **data ecosystems**. Participants noted that contemporary investigations rarely rely on a single dataset. Instead, journalists are increasingly required to identify, connect, compare, clean, and interpret heterogeneous datasets originating from multiple public and private sources. Consequently, competencies related to database management, interoperability, data integration,

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computational thinking, and advanced analytical techniques are expected to become significantly more important over the coming years.

The experts also highlighted the growing importance of **domain knowledge and quantitative literacy**. Several interviewees explained that effective data journalism requires much more than technical proficiency in handling datasets. Journalists must understand the broader context in which data are produced and be capable of interpreting statistical, economic, environmental, political, and social indicators correctly. Without sufficient contextual understanding, there is a considerable risk of drawing misleading conclusions or overlooking significant patterns hidden within complex datasets.

Another important finding concerns the future organisation of journalistic work. Many participants predicted that successful data journalism projects will increasingly rely on **multidisciplinary collaboration**, bringing together investigative reporters, data analysts, software developers, AI specialists, designers, and subject-matter experts. Rather than expecting a single professional to master every technical and journalistic competency, future newsrooms are likely to depend on collaborative teams in which complementary expertise contributes to more sophisticated and impactful investigations.

Automation also emerged as a major trend shaping the future profession. Interviewees anticipated that journalists will increasingly automate repetitive activities such as monitoring information sources, extracting structured data, cleaning datasets, generating routine visualisations, producing preliminary drafts, and tracking public databases. This evolution is expected to free journalists from time-consuming operational tasks, allowing them to focus more on investigation, interpretation, editorial judgement, and public-interest reporting.

When asked to identify the competencies that will become most important over the next three to five years, interviewees repeatedly referred to a common set of emerging priorities. These include **Artificial Intelligence and AI-assisted journalism**, **advanced data analytics and computational skills**, **coding and workflow automation**, **verification of AI-generated content**, **integration and interpretation of multiple heterogeneous datasets**, and **strong analytical and statistical literacy**. At the same time, experts unanimously agreed that these new competencies should complement—not replace—the traditional foundations of journalism, including investigative methods, critical thinking, ethical decision-making, source verification, and effective communication.

Overall, the interview findings indicate that the future of DJDC will be characterised by an increasingly close integration of journalistic expertise, data science, and artificial intelligence. While technological competencies will continue to grow in importance, the interviews clearly demonstrate that human judgement, ethical responsibility, critical interpretation, and investigative thinking will remain the defining characteristics of high-quality data journalism. These findings further support the competency framework developed in this report while highlighting several emerging competencies that should receive greater emphasis in future educational programmes and professional training initiatives.

5.6.4 Analysis of Section 4: Skills Gap Analysis

The final section of the interviews focused on identifying the most common competency gaps observed among professionals entering the field of DJDC, particularly graduates from Higher Education (HE) and Vocational Education and Training (VET) programmes. Interviewees were invited to compare the competencies expected in professional practice with those typically demonstrated by recent graduates and early-career professionals.

A) Higher Education (HE)

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Overall, the responses reveal a high degree of consistency across countries and sectors. Although interviewees represented diverse professional backgrounds—including news organisations, universities, NGOs, public institutions, and the private sector—they identified remarkably similar shortcomings. Rather than pointing to isolated technical deficiencies, the experts described a broader gap between academic preparation and the practical realities of professional data journalism.

The most frequently identified gap concerns the **limited practical experience** of university graduates. While most interviewees acknowledged that higher education institutions provide solid theoretical foundations and increasingly include technical components in their curricula, they argued that graduates often lack first-hand experience of newsroom environments, editorial workflows, multidisciplinary collaboration, production deadlines, and the organisational dynamics of media organisations. Consequently, many graduates require substantial on-the-job training before becoming fully effective professionals.

Closely related to this issue is the persistent **disconnect between higher education and labour market requirements**. Several experts observed that university programmes continue to emphasise theoretical knowledge while offering relatively limited opportunities for students to apply their competencies in authentic professional contexts. Interviewees therefore recommended stronger partnerships between universities and media organisations through internships, newsroom placements, project-based learning, and collaborative educational initiatives that expose students to real journalistic practice before graduation.

Another major theme concerns **technical competencies**. Despite noticeable improvements in recent years, many graduates were considered to have insufficient practical experience in data collection, data cleaning, programming, spreadsheet analysis, database management, automation, and computational thinking. Several experts stressed that students often possess conceptual knowledge but lack the confidence to independently manage complete data workflows, from identifying data sources to analysing, validating, and publishing results. Coding skills were repeatedly highlighted as increasingly important, not necessarily because every journalist should become a software developer, but because programming knowledge enables professionals to better understand, validate, and supervise AI-assisted analytical processes.

The interviews also revealed widespread concern regarding **data interpretation and analytical reasoning**. According to many participants, recent graduates frequently know how to access datasets and use analytical software but struggle to formulate meaningful research questions, interpret statistical evidence, identify significant patterns, or critically evaluate analytical results. Several experts emphasised that successful data journalism begins with asking the right questions rather than simply applying technical tools. The ability to understand the context behind the data and translate analytical findings into journalistic insight was consistently identified as one of the profession's most important competencies.

Closely connected to analytical thinking is the challenge of **verification**, particularly in the context of Artificial Intelligence. Many interviewees observed that young professionals increasingly rely on AI tools for coding, summarisation, analysis, and content generation without sufficiently questioning the reliability of the outputs. Experts argued that future professionals must develop stronger competencies in validating AI-generated code, verifying sources, checking statistical results, and critically evaluating automated analyses before publication. Rather than replacing technical expertise, AI makes critical judgement even more important.

Another recurring observation concerns **communication and storytelling competencies**. Although many graduates demonstrate strong analytical abilities, they often struggle to transform data into clear, engaging, and accessible narratives for non-specialist audiences. Several experts described an imbalance between technical analysis and journalistic storytelling,

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noting that reports frequently resemble academic publications rather than compelling journalistic stories. Participants therefore emphasised that effective communication, audience awareness, and narrative construction remain essential competencies that distinguish high-quality data journalism from purely technical data analysis.

The interviews also highlighted the continuing importance of **critical thinking and professional judgement**. Experts consistently noted that graduates often search for automated or simplified solutions to complex analytical problems rather than engaging in the careful reasoning, source verification, and editorial judgement required for rigorous investigative journalism. Competencies such as critical thinking, analytical reasoning, research methodology, and problem-solving were therefore considered equally important as technical knowledge.

Several participants additionally pointed to the need for **broader contextual and interdisciplinary knowledge**. Understanding economics, politics, law, history, philosophy, public administration, and other domain-specific fields was considered essential for correctly interpreting data and identifying stories of public interest. Without sufficient contextual knowledge, journalists may accurately analyse data while failing to understand its broader social, political, or economic significance.

Finally, many interviewees highlighted the importance of **hands-on learning**. Across almost all interviews, practical experience was considered the most effective way to bridge the gap between academic education and professional competence. Participants advocated project-based learning, real-world datasets, newsroom simulations, open data publishing exercises, collaborative investigations, and industry placements as mechanisms for developing both technical and journalistic competencies simultaneously.

Overall, the interview findings indicate that the principal challenge facing Higher Education is **not the absence of individual competencies but the insufficient integration of technical knowledge, journalistic practice, and real-world professional experience**. Graduates generally possess strong theoretical foundations but require greater opportunities to develop practical analytical skills, newsroom awareness, data interpretation, AI verification, storytelling, and multidisciplinary collaboration. These findings strongly support the competency framework proposed in this report and provide valuable guidance for the design of future curricula and training programmes aimed at preparing professionals for the rapidly evolving field of DJDC.

B) Vocational Education and Training (VET) programmes

Interviewees who had experience working with graduates from Vocational Education and Training (VET) programmes generally distinguished their profiles from those of Higher Education (HE) graduates. While HE graduates were often perceived as possessing stronger theoretical knowledge but limited professional experience, VET graduates were consistently described as being more practice-oriented and better prepared to perform operational tasks immediately after entering the labour market.

A recurring observation was that **VET graduates demonstrate stronger hands-on competencies** and adapt more rapidly to professional environments. Their education typically emphasizes practical exercises, industry-oriented assignments, and the use of professional tools, enabling them to become productive relatively quickly in entry-level positions. Many interviewees noted that VET graduates are generally familiar with newsroom routines, production processes, and digital workflows, making their transition into employment smoother than that of many university graduates.

Despite these strengths, experts consistently identified **limitations in theoretical, analytical, and strategic competencies**. While VET graduates often perform assigned tasks effectively, they may struggle to understand the broader editorial, social, or strategic rationale behind their work.

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Several participants emphasized that they are capable of producing content or carrying out technical operations but frequently lack a deeper understanding of journalism theory, communication processes, media systems, ethics, and the societal role of journalism. Consequently, they may require additional training to develop critical thinking and investigative judgement, particularly when working on complex data-driven or investigative projects.

Another important finding concerns **data interpretation and contextualisation**. Several experts argued that VET graduates are generally able to collect or process information but often experience difficulties interpreting datasets, identifying meaningful patterns, or placing quantitative findings within a broader journalistic context. As one interviewee observed, technical execution alone is insufficient if professionals cannot explain why particular analytical methods are appropriate or understand the editorial decisions that guide an investigation.

The interviews also highlighted the growing importance of **Artificial Intelligence and emerging technologies**. Across several countries, experts identified insufficient knowledge of AI applications as one of the most significant competency gaps among VET graduates. Although younger professionals tend to adopt AI tools more readily than previous generations, many still underutilise these technologies or apply them without fully understanding their capabilities and limitations. Interviewees stressed that future professionals should not only learn how to operate AI tools but also how to critically evaluate AI-generated outputs, integrate them into journalistic workflows, and use them responsibly for data analysis, document processing, source verification, and investigative work.

Several participants also pointed to deficiencies in **digital workflow and collaborative technical practices**. Competencies such as version control, collaborative documentation, structured project organisation, markdown, wiki-based knowledge management, and systematic file organisation were repeatedly mentioned as essential professional skills that are rarely taught explicitly. Although these competencies may appear technical, interviewees regarded them as fundamental working practices that significantly improve collaboration, particularly in multidisciplinary and cross-border investigative projects.

A further competency gap relates to **data management and collaborative investigation**. According to several experts, many early-career professionals know how to locate information within datasets but lack the ability to organise, clean, standardise, document, and structure data so that it can be effectively reused by larger investigative teams. Interviewees highlighted that contemporary investigative journalism increasingly relies on collaborative environments where datasets, archives, and AI-assisted search systems are shared among multiple journalists. Consequently, competencies related to data organisation, documentation, interoperability, and collaborative knowledge management are becoming increasingly valuable.

Another frequently mentioned weakness concerns **quantitative literacy and confidence with data**. Several interviewees observed that many journalism professionals continue to perceive numbers and statistical information as intimidating. Rather than lacking advanced statistical expertise, graduates often struggle with fundamental numerical reasoning, spreadsheet usage, percentage calculations, and basic data interpretation. This reluctance to engage confidently with quantitative information also limits their ability to exploit digital technologies and automation effectively.

Overall, the interviews suggest that **VET graduates generally possess stronger practical and operational competencies than Higher Education graduates, allowing them to integrate into professional environments more quickly. However, they often require further development in analytical thinking, theoretical understanding, investigative reasoning, contextual interpretation, AI literacy, and strategic decision-making.** These findings reinforce the competency framework proposed in this report by demonstrating that successful DJDC

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professionals require not only technical proficiency but also the ability to critically interpret information, understand complex media environments, collaborate effectively, and transform data into meaningful journalistic investigations.

5.7 Generating Description

The objective of this section was to generate a concise, coherent, and standardised description of the **DJDC** professional profile based on the competency framework developed throughout the previous phases of the study. Rather than manually drafting the description, this phase explored the use of modern Large Language Models (LLMs) and text generation models to automatically produce candidate profile descriptions that accurately reflect the identified competence domains.

Several state-of-the-art text generation models were evaluated for this purpose, including **T5**, **BART**, **FLAN-T5**, **LLaMA**, and **GPT**. These models were implemented using Python and prompted with the same structured instructions in order to generate alternative descriptions of the target professional profile. Using multiple models allowed the research team to compare different writing styles, levels of completeness, and overall quality while maintaining a consistent input across all experiments.

When designing the prompt, particular attention was given to the characteristics of a standard occupational profile description. The generated text was expected to:

- accurately represent the professional role;
- incorporate all identified competence domains;
- describe the main responsibilities and capabilities rather than listing individual skills;
- maintain a coherent and logical structure;
- be concise while remaining sufficiently informative;
- employ clear, professional, and neutral language suitable for educational and labour market contexts.

5.7.1 Descriptions for Main Categories (Skills' Domains)

In addition to generating an overall description of the DJDC professional profile, a short description was also developed for each identified **Competence Domain**. The purpose of these descriptions is to provide a clear and concise explanation of the scope, objectives, and professional focus of each competence domain, thereby facilitating a common understanding among educators, training providers, employers, and other stakeholders.

Rather than simply presenting the titles of the competence domains, these short descriptions clarify the knowledge and capabilities represented by each domain and explain how they contribute to the overall professional profile. To ensure consistency across all domains, each description was limited to **two or three sentences**, providing sufficient detail while remaining concise and suitable for competency frameworks, occupational profiles, and curriculum design.

The descriptions were generated by considering three complementary sources of information developed throughout this study:

- the Competence Domain itself;
- the corresponding Core Competences identified during the desk research phase; and
- the related ESCO illustrative skills and examples presented in Table 9-Table 17.

This combination ensures that each description reflects both the conceptual scope of the competence domain and its practical implementation within the European Skills, Competences, Qualifications and Occupations (ESCO) framework.

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To support the drafting process, Large Language Models (LLMs) were employed using a structured prompt that incorporated the competence domain together with its associated Core Competences. The generated descriptions were subsequently reviewed and refined by the research team to ensure consistency with the competency framework developed in this report.

The following prompt was used to generate the initial descriptions:

Prompt:

> *Generate a concise professional description (maximum two or three sentences) for the following competence domain within the Data Journalism and Data Communication professional profile. The description should explain the overall purpose, scope, and professional relevance of the competence domain without simply listing the skills. It should be written in a formal and neutral style suitable for a European competency framework and naturally integrate the competencies provided below.*
>
> *Competence Domain: {Competence Domain Name}*
>
> *Core Competences: {List of Core Competences}*
>
> *ESCO illustrative examples: {List of ESCO examples}*
>
> *The description should clearly explain what professionals are expected to know and be able to do within this competence domain and how these competencies contribute to effective Data Journalism and Data Communication practice.*

The resulting descriptions for all competence domains are presented in the following tables and collectively provide a concise explanation of the nine skill domains that constitute the DJDC competency framework.

After reviewing the short descriptions generated by the aforementioned text generation models, it was observed that the outputs produced by the GPT model demonstrated greater clarity, coherence, and readability than those generated by the other models. In particular, GPT consistently produced concise descriptions that accurately captured the scope and purpose of each competence domain while maintaining a professional tone suitable for a competency framework.

Consequently, the GPT-generated descriptions were selected as the final short descriptions for each Competence Domain. Table 22 presents the final descriptions adopted for the nine competence domains that constitute the DJDC competency framework.

Table 23 Generated short descriptions for each competence domain by GPT model

Competence Domain	Generated Short Description
Data & Analytics	The Data & Analytics competence domain encompasses the ability to identify, collect, verify, manage, process, analyse, and interpret data from diverse sources to support evidence-based journalism and communication. It includes competencies in data literacy, statistics, spreadsheet and database management, digital analytics, and the effective use of open data to transform raw information into reliable insights.
Data Journalism & Investigation	The Data Journalism & Investigation competence domain focuses on the ability to investigate, verify, and report evidence-based stories by combining journalistic methodologies with data-driven research. It includes competencies in investigative journalism, data journalism, fact-checking, source management, Freedom of Information (FOI) practices, and research techniques to ensure the accuracy, credibility, and transparency of published information.

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Communication & Storytelling	The Communication & Storytelling competence domain focuses on transforming data and analytical findings into clear, engaging, and accessible narratives tailored to different audiences. It encompasses competencies in data storytelling, digital and visual communication, audience analysis, audience engagement, and digital writing to effectively communicate complex information across multiple media platforms.
Visualization & Content Production	The Visualization & Content Production competence domain focuses on creating, designing, and publishing compelling data-driven content across multiple media formats. It encompasses competencies in data visualization, information design, content creation, digital publishing, media production, content management and distribution, enabling professionals to transform complex data into engaging, accessible, and visually effective stories for diverse audiences.
Digital Media & Tools	The Digital Media & Tools competence domain focuses on the effective use of digital technologies, platforms, and workflows that support the production, management, and dissemination of data-driven journalistic content. It includes competencies in digital and research tools, digital workflows, search engine optimization (SEO), and social media, enabling professionals to efficiently create, optimize, publish, and promote content across contemporary digital media ecosystems.
AI & Emerging Technologies	The AI & Emerging Technologies competence domain focuses on the responsible adoption and application of artificial intelligence and emerging digital technologies to enhance data journalism and data communication workflows. It includes competencies in artificial intelligence, ethical AI, machine learning, and innovation, enabling professionals to automate data processing, generate deeper insights, improve content creation, and adapt to the rapidly evolving technological landscape while ensuring transparency and ethical practice.
Media, Ethics & Governance	The Media, Ethics & Governance competence domain focuses on the ethical, legal, and professional principles that underpin responsible data journalism and data communication. It encompasses competencies in media law and ethics, data privacy, journalism fundamentals, media credibility, and participatory journalism, enabling professionals to produce trustworthy, transparent, and accountable content while respecting legal requirements, ethical standards, and the public interest.
Business & Strategy	The Business & Strategy competence domain focuses on understanding the economic, strategic, and market dynamics that influence the sustainability of data journalism and digital media organisations. It includes competencies in journalism and business models, revenue generation, content and marketing strategies, digital advertising, and media trends, enabling professionals to develop sustainable content initiatives, adapt to evolving digital ecosystems, and maximise the impact and reach of data-driven journalism.
Professional & Collaborative Skills	The Professional & Collaborative Skills competence domain focuses on the transferable competencies required to work effectively in multidisciplinary and dynamic data journalism environments. It encompasses critical and analytical thinking, collaboration, project and time management, and portfolio development, enabling professionals to solve complex problems, work efficiently in teams, manage data-driven projects, and continuously demonstrate and communicate their professional expertise.

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5.7.2 Formal Description for Data Journalist Profile

Following the completion of the desk research, the analysis of labour market evidence, and the evaluation of the results obtained from the survey and expert interviews, the proposed competency framework for the **DJDC** profile was refined and validated. The findings from these complementary research activities confirmed the relevance of the identified competence domains, core competences, and the associated ESCO skills, providing a comprehensive and evidence-based representation of the professional profile.

Based on this validated competency profile, a prompt was designed to guide Large Language Models (LLMs) in generating a formal occupational description for the **DJDC** profile. The objective was to produce a concise, coherent, and professionally written description that accurately reflects the purpose of the occupation, its main responsibilities, and the knowledge, skills, and competences required in contemporary European education and labour market contexts.

The following prompt was used to generate the candidate descriptions:

Prompt:

You are an expert in occupational profiling, competency frameworks (ESCO), and European education and labour market standards.

*Generate a **professional profile description** for the occupation:*

Data Journalism and Data Communication Professional

The generated description will be used in a European competency framework (e.g., ESCO, Erasmus+, DigComp, or similar projects).

1) General Requirements:

- *Write in **formal, professional English**.*
- *Produce **one coherent paragraph**.*
- *Length: **150–250 words**.*
- *Do **not** use bullet points or headings in the generated description.*
- *Avoid repeating competencies mechanically.*
- *Write naturally as an occupational profile rather than as a skills list.*
- *Maintain a neutral, objective, and European institutional writing style.*

2) The description should include

- *A concise definition of the occupation.*
- *The overall purpose of the role.*
- *Main professional responsibilities.*
- *Typical activities performed by professionals.*
- *The knowledge, skills, and competences required.*
- *Collaboration with multidisciplinary teams.*
- *Ability to communicate with both technical and non-technical audiences.*
- *Ethical and responsible use of data and AI.*
- *Evidence-based decision making.*
- *Continuous learning and adaptation to emerging technologies.*
- *Alignment with current labour market expectations.*

3) Competence Domains:

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*Integrate the following competence domains naturally throughout the text (do **not** list them explicitly):*

- *Data & Analytics*
- *Data Journalism & Investigation*
- *Communication & Storytelling*
- *Visualization & Content Production*
- *Digital Media & Tools*
- *AI & Emerging Technologies*
- *Media, Ethics & Governance*
- *Business & Strategy*
- *Professional & Collaborative Skills*

4) Core Competences

The description should reflect the following core competences whenever appropriate:

***Data & Analytics** [List of core competences]*
***Data Journalism & Investigation** [List of core competences]*
***Communication & Storytelling** [List of core competences]*
***Visualization & Content Production** [List of core competences]*
***Digital Media & Tools** [List of core competences]*
***AI & Emerging Technologies** [List of core competences]*
***Media, Ethics & Governance** [List of core competences]*
***Business & Strategy** [List of core competences]*
***Professional & Collaborative Skills** [List of core competences]*

5) ESCO Alignment

Use the following ESCO illustrative examples only as semantic guidance (do not copy them verbatim):

[Insert ESCO illustrative examples here]

Ensure that the generated profile is semantically aligned with ESCO occupations and skills while remaining original.

6) Writing Quality Criteria

The generated description should:

- *Be clear, concise, and easy to understand.*
- *Read like a real occupational profile rather than AI-generated text.*
- *Avoid redundancy and unnecessary repetition.*
- *Balance technical, journalistic, communication, and ethical aspects.*
- *Emphasize the integration of data, journalism, communication, and digital technologies.*
- *Reflect current and emerging labour market needs.*
- *Be suitable for Higher Education (HE), Vocational Education and Training (VET), and Labour Market contexts.*
- *Be reusable within European project deliverables and competency frameworks.*
- *Represent a future-oriented professional profile that remains valid despite technological evolution.*

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After generating the candidate descriptions using the selected Large Language Models (T5, BART, FLAN, LLaMA, and GPT), all generated texts were collected by the technical team at the University of Alcalá. To ensure an objective and unbiased evaluation, the identity of the language model responsible for each description was deliberately concealed before the evaluation process. This blind assessment approach prevented evaluators from being influenced by the popularity or perceived capabilities of a particular model and ensured that the assessment focused exclusively on the quality of the generated content.

The anonymised descriptions were subsequently shared with the members of the University of Alcalá research team. Each evaluator independently reviewed the five candidate descriptions according to the predefined quality criteria presented above, considering aspects such as completeness, coherence, clarity, coverage of the identified competence domains, professional writing style, and consistency with the competency framework developed throughout this report.

The evaluation was conducted according to the following quality criteria:

- Accuracy in representing the Data Journalism and Data Communication professional profile.
- Coverage of the identified competence domains and core competences.
- Logical organisation, coherence, and consistency of the text.
- Readability, clarity, and fluency.
- Professional and academic writing style.
- Conciseness while preserving essential information.
- Alignment with the competency framework developed throughout this report.
- Suitability for inclusion within a European occupational profile or competency framework.
- Clarity for Higher Education (HE), Vocational Education and Training (VET), and labour market stakeholders.
- Overall quality, completeness, and usability of the generated description.

Following the individual evaluations, the research team discussed the results and selected the description that most accurately represented the proposed occupational profile. The generated description by **GPT** was unanimously identified by all evaluators as the most appropriate. Compared with the other generated descriptions, it provided a more comprehensive and balanced representation of the professional profile, naturally integrating the identified competence domains and core competences while maintaining a clear, coherent, and professional writing style.

Consequently, the GPT-generated description was selected as the **standard professional description** for the **DJDC** profile. The final version, presented in Table 24, is therefore adopted as the official occupational description developed within the DAPHnE project and serves as the reference description for the competency framework proposed in this report.

Table 24 GPT-generated Description for Data Journalism and Data Communication Profile

Data Journalism and Data Communication Profile
A Data Journalism and Data Communication Professional collects, manages, analyses, verifies, and interprets data to produce accurate, evidence-based journalism and communicate complex information in a clear, accessible, and engaging manner for diverse audiences. The role combines investigative journalism, analytical reasoning, and digital communication with expertise in data storytelling, information design, and multimedia content production to transform raw data into meaningful insights that support transparency, public understanding, and informed decision-making. Professionals in this field identify and evaluate reliable data sources, apply appropriate analytical

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methods, conduct fact-checking and investigative research, and communicate findings through compelling narratives supported by visualisations, digital publishing platforms, and interactive media. They make effective use of digital tools, data journalism technologies, artificial intelligence, and emerging technologies while critically assessing their outputs and ensuring compliance with ethical principles, data protection regulations, media law, and professional journalistic standards. Working collaboratively within multidisciplinary teams, they contribute to editorial planning, content strategy, innovation, and sustainable digital media practices while responding to evolving audience needs and technological developments. Success in this occupation requires a balanced combination of technical expertise, journalistic judgement, critical and analytical thinking, communication skills, project management, and continuous professional learning. By integrating data, technology, investigative methods, and responsible communication, Data Journalism and Data Communication Professionals strengthen media credibility, promote accountability, and enhance the public value of journalism in an increasingly data-driven and digitally connected society.

6. National Reports Analysis

In accordance with the DAPHnE project proposal framework (Task 2.2), four comprehensive National Reports have been developed across the four participating countries of the consortium. Spearheaded by the academic partners within each nation, this research initiative aims to systematically map and evaluate the current state of Data Journalism and Data Communication at a local level. By utilizing the investigative tools and methodologies designed in the preceding stages of the project (Task 2.1), these reports delve into the specific competency gaps, emerging skill requirements, and the distinct educational realities defining both Higher Education (HE) and Vocational Education and Training (VET) contexts. The aggregated results and qualitative insights extracted from these targeted national analyses are fundamental to the project's overarching mission. They will not only foster a deeper, evidence-based understanding of the distinct professional landscapes and labour market demands in each country but will also serve as the critical foundation for designing innovative, cross-sectoral curricula that successfully bridge the gap between academic training and real-world media industry expectations.

The following subsections present a consolidated summary of the key findings and results from each country. For a more detailed and in-depth analysis, the complete and unabridged versions of the individual National Reports can be found attached in the Annex of this document.

6.1 Best practices analysis

The "Best Practices Analysis" section across the four National Reports reveals fundamental similarities alongside distinct local approaches that reflect the maturity of each country's data journalism ecosystem. A primary similarity across the consortium (Spain, Portugal, Italy, and Greece) is the strong emphasis on the civic function of data. In all four countries, best practices highlight that data journalism is no longer just a narrative tool, but an essential public service designed to promote transparency, combat misinformation, and empower citizen decision-making. Furthermore, there is a shared recognition that successful data journalism relies heavily on multidisciplinary collaboration, moving away from the isolated reporter model toward integrated teams of journalists, developers, and data analysts.

Despite these common goals, the differences highlight how each nation leverages different structural strengths. In Spain, best practices are notably driven by a dual engine: specialized data units within major public broadcasters (such as RTVE) and independent, digitally native civic foundations (like Civio and Datadista), demonstrating a highly institutionalized approach to government transparency and public accountability. Italy, conversely, stands out for its deep

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integration of civic technology ("civic tech") and specialized training platforms (such as Data Ninja), showcasing a highly dynamic and collaborative network that bridges the public sector, independent consultancies, and digital media.

In Portugal, the highlighted best practices focus heavily on independent investigative journalism platforms. These initiatives are pioneering the integration of rigorous data analysis with in-depth narrative storytelling (such as podcasts and long-form reports) to expose systemic issues and improve media literacy outside the traditional mainstream media structures. Finally, Greece presents a gradually maturing ecosystem where best practices are strongly anchored in educational and developmental catalysts. Rather than being dominated by large newsroom units, the Greek landscape relies on emerging university programs and targeted professional training initiatives as the primary drivers of data-driven innovation, responding to the ongoing challenge of achieving structural integration within traditional media outlets.

6.2 National Survey analysis

The survey conducted across the four participating countries reveals a remarkable degree of consensus regarding the foundational pillars of data journalism, alongside nuanced differences in national priorities. Across all four nations, there is a consistent ranking of Data Journalism & Investigation as a top-priority competency, reflecting a shared professional belief that investigative rigor and fact-checking are non-negotiable foundations for the practice. Communication & Storytelling and Media, Ethics & Governance also emerge as universally highly-valued skill groups, confirming that the ability to contextualize and ethically handle data remains as vital as the technical ability to process it.

Despite this core agreement, subtle differences in prioritization highlight the distinct professional and educational environments of each country. Spain displays a highly cohesive view, with strong consensus that investigative and collaborative professional skills are the primary requirements, reflecting a well-established and institutionalized data journalism landscape. Portugal's survey results align closely with the overall consensus but place a particularly strong emphasis on Data & Analytics as a core competence rather than a specialized field, indicating a professional culture that demands deep analytical mastery from all journalists. Italy presents a more heterogeneous profile, with experts and survey respondents emphasizing that while analytical relevance is growing, the importance of specific skills can fluctuate depending on the journalistic domain, reflecting a highly diverse media market. Greece underscores the importance of competencies related to AI literacy, responsible AI use, and data verification. Survey data in Greece highlights that, as a developing ecosystem, there is an urgent demand for foundational training that bridges the gap between technical potential and ethical, governance-related implementation.

Overall, while technical groups like Digital Media & Tools are consistently rated as necessary, the data indicates a collective move towards prioritizing "human" and "ethical" competencies—specifically critical thinking, ethical responsibility, and narrative clarity—across all surveyed regions. Artificial Intelligence is acknowledged as a significant future driver, but survey respondents consistently emphasize that it must serve as an assistant to, not a replacement for, human judgment and verification.

6.3 Interviews analysis

To conduct this cross-country comparison, a systematic thematic analysis was applied across the four individual National Reports (Spain, Italy, Greece, and Portugal). Specifically, the core findings, survey metrics, best practices, and qualitative expert interview conclusions from each

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country were mapped against the shared WP2 analytical framework. This comparative approach enabled the research team to identify cross-national convergences, highlight country-specific educational and market realities, and aggregate the overarching European priorities presented below. Across all four countries, the interviews consistently highlighted a significant disconnect between current academic curricula and the practical demands of the media industry.

A recurring theme in all national contexts is the necessity for an interdisciplinary and collaborative professional profile. Experts in Spain, Italy, Portugal, and Greece unanimously argued that future data journalists cannot function as isolated technicians; instead, they must possess a blend of advanced technical skills—such as data analysis, programming, and AI utilization—integrated with strong ethical awareness, critical reasoning, and a humanistic foundation.

For Spain, the expert validation underscored the role of data journalism as a "tool for citizenship." Experts emphasized that technical mastery is insufficient without the ability to verify sources, interrogate metadata, and build datasets that address the "absences" in public data, thereby empowering citizens to make informed democratic decisions. The Italian interviews prioritized the need for "reproducible analytical workflows" and project management capabilities. Experts highlighted that the profession is evolving toward multidisciplinary team-based models where journalists must collaborate effectively with developers, designers, and subject-matter experts to create robust, evidence-based narratives. The insights from Portugal centered on the structural gap between Higher Education and Vocational Education and Training. Experts noted that while university graduates often possess strong theoretical knowledge, they frequently lack practical, hands-on experience in data cleaning, visualization, and AI applications that are standard in dynamic newsrooms. In the Greek context, interviews pointed to the growing need for specialized investigative methodologies, including Open-Source Intelligence (OSINT) and cross-border collaboration. Experts stressed that the training focus should remain on practice-oriented education that prepares journalists to navigate complex, data-driven, and AI-mediated information environments while upholding a firm commitment to public-interest journalism.

As overall findings, expert validation phase confirms that while technical expertise is a prerequisite, the future of the profession lies in the ability to combine quantitative evidence with contextual understanding, ethical rigor, and a commitment to communication impact. All national partners agree that fostering lifelong learning and strengthening the bridge between academic institutions and professional training providers are the two most critical levers to future-proof the next generation of data journalists.

7. Final Profile

This section presents the final **Data Journalism and Data Communication (Data Journalist)** professional profile developed within the DAPHnE project. The profile is the result of the multi-phase methodology described throughout this report, including desk research, labour market analysis, survey analysis, expert interviews, semantic alignment with the ESCO framework, and AI-assisted profile generation and validation.

Due to space limitations, it is not possible to include the complete competency framework within this deliverable. Therefore, the full profile is provided as a structured **Excel dataset** available through the **Zenodo repository**, which constitutes the official and complete project output. The following subsections describe the overall structure of this final dataset.

The final profile begins with a **general professional description**, developed through the AI-assisted methodology presented in **Section 5.7.2** and subsequently validated by the University

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of Alcalá research team. This description defines the overall purpose of the occupation, its main responsibilities, and the knowledge, skills, and competences expected from professionals working in the field. Table 25 presents the final professional description.

Table 25 Final Description for Data Journalism and Data Communication Profile

Title	**Data Journalism and Data Communication Profile**
Description	A Data Journalism and Data Communication Professional collects, manages, analyses, verifies, and interprets data to produce accurate, evidence-based journalism and communicate complex information in a clear, accessible, and engaging manner for diverse audiences. The role combines investigative journalism, analytical reasoning, and digital communication with expertise in data storytelling, information design, and multimedia content production to transform raw data into meaningful insights that support transparency, public understanding, and informed decision-making. Professionals in this field identify and evaluate reliable data sources, apply appropriate analytical methods, conduct fact-checking and investigative research, and communicate findings through compelling narratives supported by visualisations, digital publishing platforms, and interactive media. They make effective use of digital tools, data journalism technologies, artificial intelligence, and emerging technologies while critically assessing their outputs and ensuring compliance with ethical principles, data protection regulations, media law, and professional journalistic standards. Working collaboratively within multidisciplinary teams, they contribute to editorial planning, content strategy, innovation, and sustainable digital media practices while responding to evolving audience needs and technological developments. Success in this occupation requires a balanced combination of technical expertise, journalistic judgement, critical and analytical thinking, communication skills, project management, and continuous professional learning. By integrating data, technology, investigative methods, and responsible communication, Data Journalism and Data Communication Professionals strengthen media credibility, promote accountability, and enhance the public value of journalism in an increasingly data-driven and digitally connected society.

The profile is further organised into **nine Competence Domains (Skills Groups)** representing the principal areas of competence required for DJDC professionals. Each competence domain is accompanied by a concise description that clarifies its scope and role within the overall professional profile. These domain descriptions were developed using the methodology described in **Section 5.7.1**. Table 26 summarises the nine competence domains together with their corresponding descriptions.

Table 26 Final Competence Domains and their descriptions

	Competence Domain (Skill Groups)	**Description**
1	Data & Analytics	The **Data & Analytics** competence domain encompasses the ability to identify, collect, verify, manage, process, analyse, and interpret data from diverse sources to support evidence-based journalism and communication. It includes competencies in data literacy, statistics, spreadsheet and database management, digital analytics, and the effective use of open data to transform raw information into reliable insights.

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2	Data Journalism & Investigation	The **Data Journalism & Investigation** competence domain focuses on the ability to investigate, verify, and report evidence-based stories by combining journalistic methodologies with data-driven research. It includes competencies in investigative journalism, data journalism, fact-checking, source management, Freedom of Information (FOI) practices, and research techniques to ensure the accuracy, credibility, and transparency of published information.
3	Communication & Storytelling	The **Communication & Storytelling** competence domain focuses on transforming data and analytical findings into clear, engaging, and accessible narratives tailored to different audiences. It encompasses competencies in data storytelling, digital and visual communication, audience analysis, audience engagement, and digital writing to effectively communicate complex information across multiple media platforms.
4	Visualization & Content Production	The **Visualization & Content Production** competence domain focuses on creating, designing, and publishing compelling data-driven content across multiple media formats. It encompasses competencies in data visualization, information design, content creation, digital publishing, media production, content management and distribution, enabling professionals to transform complex data into engaging, accessible, and visually effective stories for diverse audiences.
5	Digital Media & Tools	The **Digital Media & Tools** competence domain focuses on the effective use of digital technologies, platforms, and workflows that support the production, management, and dissemination of data-driven journalistic content. It includes competencies in digital and research tools, digital workflows, search engine optimization (SEO), and social media, enabling professionals to efficiently create, optimize, publish, and promote content across contemporary digital media ecosystems.
6	AI & Emerging Technologies	The **AI & Emerging Technologies** competence domain focuses on the responsible adoption and application of artificial intelligence and emerging digital technologies to enhance data journalism and data communication workflows. It includes competencies in artificial intelligence, ethical AI, machine learning, and innovation, enabling professionals to automate data processing, generate deeper insights, improve content creation, and adapt to the rapidly evolving technological landscape while ensuring transparency and ethical practice.
7	Media, Ethics & Governance	The **Media, Ethics & Governance** competence domain focuses on the ethical, legal, and professional principles that underpin responsible data journalism and data communication. It encompasses competencies in media law and ethics, data privacy, journalism fundamentals, media credibility, and participatory journalism, enabling professionals to produce trustworthy, transparent, and accountable content while respecting legal requirements, ethical standards, and the public interest.
8	Business & Strategy	The **Business & Strategy** competence domain focuses on understanding the economic, strategic, and market dynamics that influence the sustainability of data journalism and digital media organisations. It includes competencies in journalism and business models, revenue generation, content and marketing strategies, digital advertising, and media trends, enabling professionals to develop sustainable content initiatives, adapt to evolving digital ecosystems, and maximise the impact and reach of data-driven journalism.

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9	Professional & Collaborative Skills	The **Professional & Collaborative Skills** competence domain focuses on the transferable competencies required to work effectively in multidisciplinary and dynamic data journalism environments. It encompasses critical and analytical thinking, collaboration, project and time management, and portfolio development, enabling professionals to solve complex problems, work efficiently in teams, manage data-driven projects, and continuously demonstrate and communicate their professional expertise.

Each Competence Domain is composed of a set of **Core Competences**, representing the fundamental professional capabilities associated with that domain. The methodology used to identify these competence domains and core competences is described in **Sections 5.1 and 5.2**. Table 27 presents the complete mapping between each Competence Domain and its corresponding Core Competences.

Table 27 Core Competences of the final profile

Domain	Core Competence
Data & Analytics	Data Analysis, Data Collection, Data Processing, Data Management, Data Interpretation, Data Literacy, Data Sourcing, Database Management, Spreadsheet Analysis, Statistics, Digital Analytics, Open Data, Data Verification
Data Journalism & Investigation	Data Journalism, Investigative Journalism, Investigative Data Journalism, Accountability Journalism, Fact-Checking, Freedom of Information (FOI), Source Management, Research Skills,
Communication & Storytelling	Data Storytelling, Data Communication, Communication, Digital Communication, Media Communication, Journalism Writing, Digital Writing, Storytelling, Visual Communication, Audience Engagement, Audience Analysis, Communication Strategy"
Visualization & Content Production	Data Visualization, Information Design, Content Creation, Content Creation Tools, Content Curation, Content Distribution, Content Management, Digital Publishing, Media Production, Broadcast Journalism, Photojournalism
Digital Media & Tools	Digital Journalism, Digital Literacy, Digital Workflow, Digital Media Tools, Digital Tools, Data Journalism Tools, Research Tools, SEO, social media, Digital Trends, Media Trends.
AI & Emerging Technologies	Artificial Intelligence, Ethical AI, AI Strategy, Machine Learning, Innovation
Media, Ethics & Governance	Data Ethics, Data Privacy, Media Law & Ethics, Media Credibility, Journalism Fundamentals, Participatory Journalism, Domain Knowledge
Business & Strategy	Business Models, Journalism Business Models, Revenue Models, Marketing Strategy, Digital Advertising, Content Strategy.
Professional & Collaborative Skills	Critical Thinking, Analytical Thinking, Collaboration, Project Management, Portfolio Development, Time Management

Finally, each Core Competence is linked to a collection of semantically related **ESCO competences**, identified through the semantic matching methodology described in **Section 5.3**. These ESCO entries provide illustrative examples of the knowledge and skills associated with each Core Competence. The **S/K** indicator specifies the ESCO competence type, where **S** denotes a **Skill** and **K** denotes **Knowledge**. Table 28 presents a portion of representative ESCO examples associated with each Core Competence. The full table is available at Zenodo repository.

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Table 28 ESCO examples linked to Core Competences

Competence Domain	Core Competence	ESCO illustrative example
Data & Analytics	Data Analysis	statistical analysis system software (K)
		inspect data (S)
		use data processing techniques (S)
		analyse data about clients (S)
		⋮
	Data Collection	statistics (K)
		collect ICT data (S)
		manage data collection systems (S)
		gather data (S)
	⋮	⋮
Data Journalism & Investigation	Accountability Journalism	journalism (K)
		report live online (S)
		ethical code of conduct of journalists (K)
		⋮
	Data Journalism	news analytics (K)
		evaluate data, information and digital content (S)
		journalism (K)
		report live online (S)
		⋮
⋮	⋮	⋮

In the initial mapping phase, a total of 600 ESCO-linked skills were extracted and associated with the Core Competences identified for the DJDC profile; after a systematic deduplication process to eliminate skills that overlapped across multiple Core Competence groups, this set was consolidated into a unique list of 374 ESCO skills.

To ensure maximum transparency and methodological rigor in reducing the pool from 374 to the final 52 ESCO skills, a structured three-stage prioritization protocol was applied. First, quantitative filtering was conducted by ranking skills according to their semantic similarity scores and frequency of appearance across the analysed training programs and job vacancy datasets (OVATE and EURES). Second, a qualitative domain-relevance screening was performed to filter out overly broad or generic transversal skills (such as basic office software usage) in favour of skills specifically operationalizing DJDC workflows. Third, domain-balancing rules were enforced to guarantee that each of the nine Competence Domains retained a representative and proportional share of core skills, preventing technical analytics from overshadowing ethical, storytelling, or strategic dimensions. Finally, this candidate shortlist underwent consensus-based expert validation through internal partner reviews and cross-referencing with the qualitative feedback gathered in Phase 3 interviews, confirming that the remaining 52 skills accurately capture the essential, non-redundant core of contemporary Data Journalism and Data Communication practice.

Crucially, this shortlisting was validated against the results of the Survey and Interview data collected from domain experts and practitioners, ensuring that the final 52 skills (Table 29) not only reflect the theoretical ESCO framework structure but are also empirically grounded in the actual competencies identified as essential by professionals working in the field.

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able 29 Final set of ESCO skills and Knowledge examples for the Data Journalist Profile

Competence Domain	ESCO Skills or Knowledge examples	
	Skill/Competence	**Knowledge**
Data & Analytics	perform data analysis, apply statistical analysis techniques, statistics, identify statistical patterns, gather data, manage data, use databases, perform data mining	statistics
Data Journalism & Investigation	check stories, gather data for forensic purposes, critically evaluate information and its sources, ethical code of conduct of journalists, conduct research interview	journalism, investigation research methods, check stories, gather data for forensic purposes, critically evaluate information and its sources, ethical code of conduct of journalists
Communication & Storytelling	tell a story, create animated narratives, use communication techniques, develop communications strategies, write headlines, use different communication channels	digital journalism, graphic design
Visualization & Content Production	data models, create digital content, structure information	data visualisation software, prepare visual data, visual presentation techniques, data models, create digital content, structure information, information architecture
Digital Media & Tools	create online news content, develop reporting software, have computer literacy, stay up to date with social media	search engine optimisation, social media management
AI & Emerging Technologies	Perform data mining	machine learning, data science, principles of artificial intelligence
Media, Ethics & Governance	protect personal data and privacy,	data security principles, GDPR, media law
Business & Strategy	develop media strategy, plan digital marketing, keep up with trends	trendwatching, types of media
Professional & Collaborative Skills	think analytically, think critically	project management

8. Conclusion

This report presented a systematic methodology for developing a comprehensive occupational profile for the emerging **Data Journalism and Data Communication** profession. The research adopted the **ESCO framework** as the primary European reference for identifying and organising competences, ensuring compatibility with existing European education and labour market standards. A multi-method research design was implemented, combining desk research on relevant training courses and educational programmes, analysis of current labour market demands through European job market platforms, and Natural Language Processing (NLP) techniques based on semantic text embeddings to identify and map the most relevant ESCO skills to the identified core competences. The technical analysis was further complemented by a large-scale survey involving a diverse group of stakeholders—including higher education institutions, vocational education and training providers, media professionals, researchers, journalists, industry representatives, and policy stakeholders—as well as in-depth interviews with recognised experts in journalism, data journalism, communication, and digital media. This

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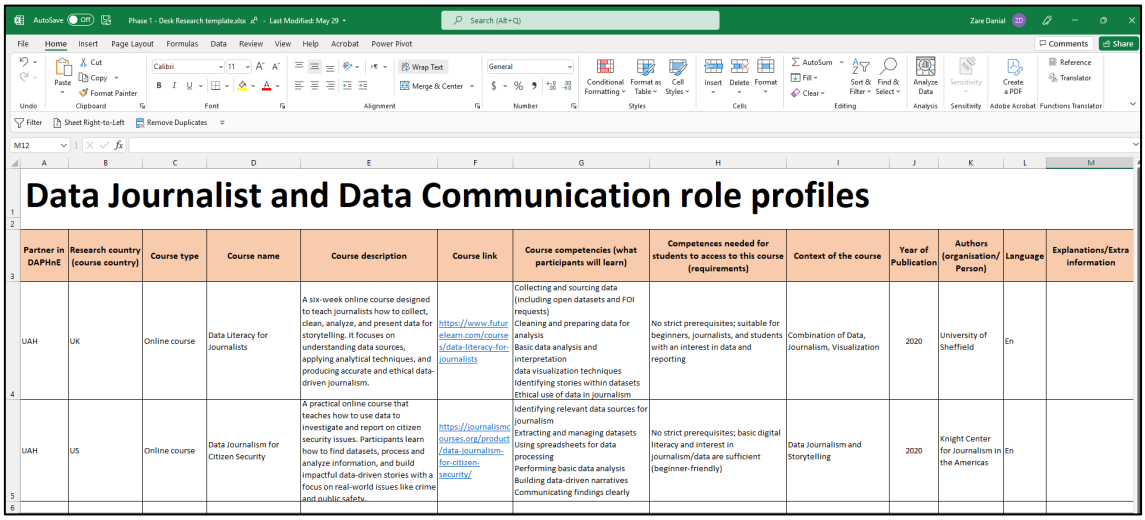
iterative validation process ensured that the proposed competency framework reflects both academic perspectives and current labour market needs.

The outcome of this research is a coherent, evidence-based occupational profile for **DJDC**, designed to support curriculum development, vocational training, professional upskilling, and future competence frameworks at the European level. The profile includes a comprehensive professional description, nine competence domains, their associated core competences, and a detailed mapping of relevant ESCO competences classified according to **Skills (S)** and **Knowledge (K)**. By integrating educational evidence, labour market intelligence, expert validation, and AI-supported semantic analysis, the proposed framework provides a robust and future-oriented reference for the profession. It offers a common competency language that can facilitate curriculum design, qualification development, skills recognition, and workforce development, while remaining sufficiently flexible to accommodate future technological advances and the evolving role of artificial intelligence and data-driven communication within journalism and digital media.

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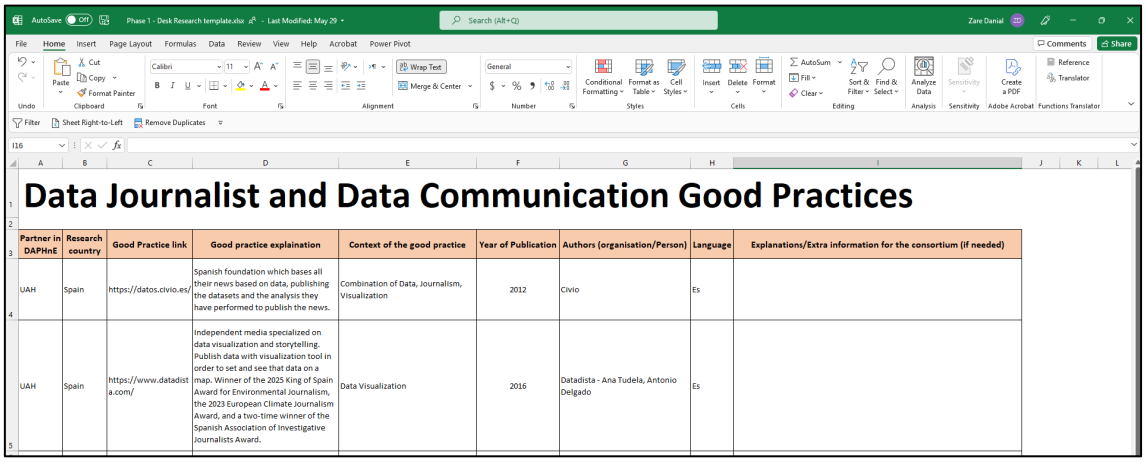
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Annex 1: Sample courses & good practices



Data Journalist and Data Communication role profiles

Partner in DAPHnE	Research country (course country)	Course type	Course name	Course description	Course link	Course competencies (what participants will learn)	Competences needed for students to access to this course (requirements)	Context of the course	Year of Publication	Authors (organisation/ Person)	Language	Explanations/Extra information
UAH	UK	Online course	Data Literacy for Journalists	A six-week online course designed to teach journalists how to collect, clean, analyze, and present data for storytelling. It focuses on understanding data sources, applying analytical techniques, and producing accurate and ethical data-driven journalism.	https://www.futurelearn.com/courses/data-literacy-for-journalists	Collecting and sourcing data (including open datasets and FOI requests) Cleaning and preparing data for analysis Basic data analysis and interpretation data visualization techniques Identifying stories within datasets Ethical use of data in journalism	No strict prerequisites; suitable for beginners, journalists, and students with an interest in data and reporting	Combination of Data, Journalism, Visualization	2020	University of Sheffield	En	
UAH	US	Online course	Data Journalism for Citizen Security	A practical online course that teaches how to use data to investigate and report on citizen security issues. Participants learn how to find datasets, process and analyze information, and build impactful data-driven stories with a focus on real-world issues like crime and public safety.	https://journalismcourses.org/product/data-journalism-for-citizen-security/	Identifying relevant data sources for journalism Extracting and managing datasets Using spreadsheets for data processing Performing basic data analysis Building data-driven narratives Communicating findings clearly	No strict prerequisites; basic digital literacy and interest in journalism/data are sufficient (beginner-friendly)	Data Journalism and Storytelling	2020	Knight Center for Journalism in the Americas	En	



Data Journalist and Data Communication Good Practices

Partner in DAPHnE	Research country	Good Practice link	Good practice explanation	Context of the good practice	Year of Publication	Authors (organisation/Person)	Language	Explanations/Extra information for the consortium (if needed)
UAH	Spain	https://datos.civio.es/	Spanish foundation which bases all their news based on data, publishing the datasets and the analysis they have performed to publish the news.	Combination of Data, Journalism, Visualization	2012	Civio	Es	
UAH	Spain	https://www.datadista.com/	Independent media specialized on data visualization and storytelling. Publish data with visualization tool in order to set and see that data on a map. Winner of the 2025 King of Spain Award for Environmental Journalism, the 2023 European Climate Journalism Award, and a two-time winner of the Spanish Association of Investigative Journalists Award.	Data Visualization	2016	Datadista - Ana Tudela, Antonio Delgado	Es	

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Annex 2: EUSURVEY

Identifying Key Competences for Data Journalism and Data Communication

Fields marked with * are mandatory.

Disclaimer
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Daphne Project website: https://daphne-project.eu/

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https://www.linkedin.com/company/daphne-project/

Purpose: This survey aims to identify and validate the key skills and competences required for Data Journalism and Data Communication across Higher Education (HE), Vocational Education and Training (VET), and the labour market. The survey seeks expert feedback to support the development of a structured competency framework aligned with current educational and professional needs in the field.

Section 1- Background and Respondent Profile

* **1. In which country is you your organization based (headquartered)?**
Please choose from the following list:

* **2. Name of your organization:**

* **3. Which of the stakeholder(s) you represent in a Data Journalism and Data Communication project/initiative?**

- ○ Higher Education Institution (HEI)
- ○ Vocational Education and Training (VET) Provider
- ○ Research Organisation / Researcher
- ○ Media Organisation / Newsroom
- ○ Journalist / Data Journalist
- ○ Communication or Media Professional
- ○ NGO / Civil Society Organisation
- ○ Public Sector / Government Institution
- ○ Private Sector / Industry
- ○ Technology or Digital Solutions Provider
- ○ Freelancer / Independent Expert
- ○ Student / Learner
- ○ Policy Maker
- ○ Trainer / Educator
- ○ Other (please specify)

* **4. How familiar are you with the concept of Data Journalism and Data Communication?**
Click on the button, from none (0) to very much (5)

0	1	2	3	4	5

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* 5. Through which DAPHnE project partner did you hear about this survey?

- ○ AUTH (Aristotle University of Thessaloniki)
- ○ CCI/OBCT (Centro per la Cooperazione Internazionale)
- ○ UNIROMA (University of Rome "Tor Vergata")
- ○ UAH (Universidad de Alcalá)
- ○ EVD (Evodevo)
- ○ OGL (Ordine Consiglio Lombardia)
- ○ DATAPITCH
- ○ UNL (Universidade Nova de Lisboa)
- ○ DEFOIN
- ○ INOVA+
- ○ IPG (Instituto Politécnico da Guarda)

Section 2- Data Journalism and Data Communication Skills Needs

6. In your experience. Which of the following set skills are most important for professionals working in the scope of Data Journalism and Data Communication?

(Please rate each skill on a scale from 0 = Not important to 5 = Very important)

	0	1	2	3	4	5
Data & Analytics (Data Analysis, Data Collection, Data Processing, Data Interpretation, etc)	○	○	○	○	○	○
Data Journalism & Investigation (Data Journalism, Fact-Checking, Freedom of Information (FOI), etc.)	○	○	○	○	○	○
Communication & Storytelling (Data Storytelling, Communication, Journalism Writing. etc.)	○	○	○	○	○	○
Visualization & Content Production (Data Visualization, Information Design, Content Creation, etc.)	○	○	○	○	○	○
Digital Media & Tools (Digital Journalism, Digital Literacy, Digital Workflow, Digital Tools, etc.)	○	○	○	○	○	○
AI & Emerging Technologies (Artificial Intelligence, Ethical AI, Machine Learning, etc.)	○	○	○	○	○	○
Media, Ethics & Governance (Data Ethics, Data Privacy, Media Law & Ethics, Journalism Fundamentals, etc.)	○	○	○	○	○	○
Business & Strategy (Journalism Business Models, Digital Advertising, Media Trends, Content Strategy, etc.)	○	○	○	○	○	○
Professional & Collaborative Skills (Critical Thinking, Analytical Thinking, Collaboration, Project Management, etc.)	○	○	○	○	○	○

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7. Please rank the following skill groups according to their importance for the Data Journalism and Data Communication profile.

Use drag&drop or the up/down buttons to change the order or accept the initial order.

- **Data & Analytics** (Data Analysis, Data Collection, Data Processing, Data Interpretation, etc.)
- **Data Journalism & Investigation** (Data Journalism, Fact-Checking, Research Skills, Freedom of Information (FOI), etc.)
- **Communication & Storytelling** (Data Storytelling, Communication, Digital Communication, Journalism Writing, etc.)
- **Visualization & Content Production** (Data Visualization, Information Design, Content Creation, etc.)
- **Digital Media & Tools** (Digital Journalism, Digital Literacy, Digital Workflow, Digital Tools, etc.)
- **AI & Emerging Technologies** (Artificial Intelligence, Ethical AI, Machine Learning, etc.)
- **Media, Ethics & Governance** (Data Ethics, Data Privacy, Media Law & Ethics, Journalism Fundamentals, etc.)
- **Business & Strategy** (Journalism Business Models, Digital Advertising, Media Trends, Content Strategy, etc.)
- **Professional & Collaborative Skills** (Critical Thinking, Analytical Thinking, Collaboration, Project Management, etc.)

8. Are there any additional skill groups or competence areas that you believe should be included in the Data Journalism and Data Communication profile but are not listed above?

If yes, please specify and briefly explain your suggestion.

9. If you wish, please indicate your email address

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Annex 3: Interview Template

DAPHNE

WP2 T2.2 - Data Journalism & Data Communication Competency Validation Interview

Universidad de Alcalá

Project and document Information:

Work package: **WP2**

Task: **T2.2 Interview**

Task leaders: **University of Alcalá (UAH)**

Document type: Internal

Authors: Luis Fernández Sanz, Danial Zare, Vera Pospelova, Inés López

Document History			
Version	**Date**	**Author**	**Comments**
V01	June 2026	UAH	First draft
V02	June 2026	UAH	Interview template

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DAPHNE

WP2 T2.2 - Data Journalism & Data Communication Competency Validation Interview

Universidad de Alcalá

Interview Information

Interview Title: Expert Validation Interview for Data Journalism & Data Communication Competency Framework

Interview Date: _____

Interview Duration: _____

Interviewee Name: _____

Interviewer Name and Project Partner: _____

Introduction to the Interview

Purpose Statement

Thank you for participating in this interview. The purpose of this study is to analyse and refine a competency framework for professionals working in Data Journalism and Data Communication.

Your expertise will help us understand the relative importance of different competency areas, identify emerging skill requirements, and assess future trends in the profession.

There are no right or wrong answers. We are interested in your professional experience, observations, and expert judgment.

The interview is expected to take approximately 20-30 minutes.

All responses will be treated confidentially and used solely for research and framework development purposes.

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Section 1: Interviewee Profile

Interviewer Instructions

The objective of this section is to collect background information about the participant and establish the context for interpreting their responses.

Please:

- Record all information accurately.
- Clarify professional titles or organizational roles if necessary.
- Encourage participants to briefly describe their current responsibilities.
- Ask follow-up questions when expertise areas are broad or unclear.

Suggested Introduction:

"Before we begin discussing competencies, I would like to learn more about your professional background and experience in Data Journalism and Data Communication."

Professional Information

1. Full Name:
2. Current Position/Job Title:
3. Organization/Institution:
4. Country:
5. Industry Sector:
    - News Media
    - Digital Media
    - Research Institute
    - NGO
    - Government
    - Academia
    - Private Sector
    - Other: _____
6. Area(s) of Expertise:
    - Data Journalism
    - Investigative Journalism
    - Data Analysis
    - Data Visualization
    - Digital Media
    - Communication
    - AI in Journalism
7. Years of Professional Experience (cannot be less than 5):
    - 6–10 years
    - 11–15 years
    - 16–20 years
    - 20+ years
8. Brief Description of Current Professional Roles:

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WP2 T2.2 - Data Journalism & Data Communication Competency Validation Interview

Section 2: Competency Importance Assessment

Interviewer Instructions

The objective of this section is to evaluate the results of the previous survey (available as a a PowerPoint presentation which could be sent in advance to enable interviewees analysis) and ask for interviewee opinion about perceived importance of each competency area and possible refinements to the skills model.

For each competency category:

1) Show the participant the survey results (presentation)
2) Ask the participant to analyse these results and provide comments on items to be merge, changed, removed or added.
3) Explore opinion behind high or low ratings.
4) Ask whether the importance of the is increasing, decreasing, or remaining stable.

If necessary, remind participants that they should evaluate competencies based on their importance for successful professional performance rather than personal preference.

Suggested Introduction:

"I will now present several competency areas that have been identified through previous research. For each area, please assess its importance for a successful Data Journalism and Data Communication professional and explain your reasoning."

Please check the presentation of the findings before starting to answer these questions. These findings are the results of the conducted survey on Data Journalist competencies analysis.

Follow-up Questions:

1. Please explain your agreement or disagreement with the obtained results. What additional competencies are not included in this framework but should be considered? Are there any skills or skills groups you believe should be added, merged, removed, or renamed?

2. Please rank the following competency areas from most important (1) to least important (9) according to your experience.

___ Data & Analytics
___ Data Journalism & Investigation
___ Communication & Storytelling
___ Visualization & Content Production
___ Digital Media & Tools
___ AI & Emerging Technologies
___ Media, Ethics & Governance
___ Business & Strategy
___ Professional & Collaborative Skills

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Section 3: Professional Background

Interviewer Instructions

The objective of this section is to understand the participant's perspective on the field and identify their overall view of professional requirements.

Please:

- Encourage participants to provide examples from their professional experience.
- Explore changes they have observed in the industry.
- Focus on competencies, challenges, and future developments.
- Allow flexibility for participants to discuss emerging trends not explicitly mentioned in the framework.

Suggested Introduction:

"To better understand your perspective, I would like to discuss your views on the current state and future direction of Data Journalism and Data Communication."

Follow-up Questions:

1. What is today's data journalism competencies landscape and which emerging trends are likely to shape the profession in the next 3–5 years? Which three competency areas will become most important in the next five years?

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Section 4: Skills Gap Analysis

Interviewer Instructions

The objective of this section is to identify current competency deficiencies within the profession.

Please:

- Focus on practical skill gaps observed in workplaces.
- Encourage participants to compare expectations with actual workforce capabilities.
- Probe for examples involving recent graduates, early-career professionals, or journalists transitioning into data-related roles.
- Explore both technical and non-technical skills.

Suggested Introduction:

"I would now like to discuss the skills and competencies that are often lacking among professionals entering labour market or already working in this field."

Follow-up Questions:

1. What are the most common skill gaps you observe among professionals entering the field coming from HE (Higher Education)? *(* Only if you work with university graduates)*

2. What are the most common skill gaps you observe among professionals entering the field coming from VET (Vocational and Educational Training)? *(* Only if you work with VET graduates)*

Closing Statement

Thank you for sharing your expertise and insights.

Your feedback will play an important role in validating and improving the Data Journalism and Data Communication Competency Framework. We greatly appreciate your time and contribution to this research.

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Annex 4: National Reports

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DAPHNE

National Report (Spain)

Universidad de Alcalá

WP2

Project and document Information:

Work package: WP2

Task: 2.3 National Report

Task leaders: University of Alcalá (UAH)

Document type: Internal

Authors: Luis Fernández Sanz, Danial Zare, Vera Pospelova, Inés López

Document History			
Version	**Date**	**Author**	**Comments**
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1 Executive summary

This National Report, developed as part of Work Package 2 (WP2) of the DAPHnE project, presents the findings from the activities conducted under Task 2.2 (T2.2), utilizing the methodological tools designed in Task 2.1 (T2.1). The primary objective of this document is to analyze data at the national level and provide a comprehensive overview of the current landscape and industry needs regarding key competencies. Specifically, this document outlines the results of the activities conducted under Task 2.2 (T2.2), applying the analytical tools as desk research, survey, and interviews developed in Task 2.1 (T2.1) to the national context.

The foundation for this analysis stems from a preceding phase, which reviewed international training programs and best practices to identify the core competencies required in the sector. This initial extraction resulted in the categorization of nine critical occupational and skill groups: Data & Analytics, Data Journalism & Investigation, Communication & Storytelling, Visualization & Content Production, Digital Media & Tools, AI & Emerging Technologies, Media, Ethics & Governance, Business & Strategy, and Professional & Collaborative Skills.

Building upon this framework, a national survey was deployed to assess the perceived importance and relevance of these nine specific skill groups among stakeholders. This report details the insights derived from this survey data, mapping out the national priorities and skill gaps.

Furthermore, the report sets the stage for the next phase of the project, where these initial survey results and the identified skill groups will be rigorously validated and further complemented through targeted interviews with industry experts. Ultimately, this national analysis will contribute to establishing a clear, evidence-based framework for the professional profile and competencies required in the field.

2 Introduction

This National Report is developed as a key component of Work Package 2 (WP2) within the DAPHnE project, specifically addressing the objectives outlined in Task 2.2. The primary aim of this document is to provide a comprehensive, evidence-based analysis of the current landscape, skill requirements, and industry needs regarding key competencies in data journalism and communication at the national level.

To achieve this, the report synthesizes findings from a multi-stage methodological approach, utilizing the analytical tools and frameworks developed during Task 2.1. In order to provide a holistic and structured view of the national context, this report is organized into the following three main sections:

- **Section 1: Desk Research and Best Practices.** The first section explores the initial findings derived from a comprehensive desk research phase. It analyzes the good practices identified at the national level.
- **Section 2: National Survey Results.** The second section presents a detailed analysis of the quantitative data gathered through a targeted Daphne survey. This survey was distributed to the relevant stakeholders and professionals to assess the perceived importance, current demand, and relevance of the predefined skill groups results obtained from the Desk Research phase.
- **Section 3: Expert Interviews.** The final section details the qualitative insights obtained from in-depth interviews conducted with national industry experts. These interviews serve to validate, complement, and provide deeper context to the survey results, ensuring that the identified competencies accurately reflect the realities of the professional landscape.

By integrating these three dimensions—existing best practices, broad stakeholder perceptions, and expert validation—this report aims to establish a clear and robust framework for the professional profiles required in the sector, ultimately guiding the subsequent educational and vocational training developments of the DAPHnE project.

3 Best practices analysis

3.1 Best Practice 1

Description: Spanish Foundation which bases all their news based on data, publishing the datasets and the analysis they have performed to publish the news.

Link to the website: https://datos.civio.es/

Why is relevant: Fundación Civio represents an indispensable benchmark for the DAPHnE project in the field of investigative journalism and transparency in Spain, serving as a model of excellence for how open data can be transformed into a public service. Its relevance lies in its systemic approach, which exemplifies the practical integration of several key competency groups identified, particularly *Data Journalism & Investigation*, *Data & Analytics*, and *Media, Ethics & Governance*. Civio goes beyond the mere technical extraction and processing of complex datasets (such as general budgets or public contracts); it stands out for its active defense of the Transparency Law and Freedom of Information (FOI), applying a rigorous ethical standard to promote institutional accountability. For the design of future professional profiles and training curricula in Higher Education and VET, Civio's methodology demonstrates how the combination of analytical skills, the use of digital tools for scraping, and information visualization can sustainably converge to create high-impact journalistic stories. Furthermore, its non-profit organizational model offers a highly valuable case study for the *Business & Strategy* area, showcasing alternative funding and sustainability pathways in independent data journalism.

3.2 Best Practice 2

Description: Independent media specialized on data visualization and storytelling. Publish data with visualization tool in order to set and see that data on a map. Winner of the 2025 King of Spain Award for Environmental Journalism, the 2023 European Climate Journalism Award, and a two-time winner of the Spanish Association of Investigative Journalists Award.

Link to the website: https://datos.civio.es/

Why is relevant: Datadista its innovative approach to deep, investigative data journalism and its emphasis on clear, impactful narratives. This initiative perfectly illustrates the crucial intersection between *Data Journalism & Investigation*, *Visualization & Content Production*, and *Communication & Storytelling*. Datadista excels at taking complex macro-datasets—often related to economics, environment, and political corruption—and transforming them into accessible, highly visual formats (such as detailed infographics, interactive charts, and structured social media threads) that resonate with the general public. For the DAPHnE

project, their methodology highlights the critical importance of teaching not only *Data & Analytics* (how to clean and process data) but also the Information Design skills necessary to communicate findings effectively. Additionally, as an independent media outlet founded by journalists, it serves as a practical example for the *Business & Strategy* and *Professional & Collaborative Skills* groups, demonstrating how entrepreneurial mindsets, content strategy, and new digital business models are essential for the survival and success of modern data-driven journalism.

3.3 Best Practice 3

Description: Spanish independent digital newspaper specialised in the data-driven analysis of international events. For their analysis, they include a wide range of storytelling techniques, ranging from more traditional journalism methods (like in-depth explanations, short news and interviews) to more innovative ones, including self-made infographs, maps and podcast episodes, ensuring complex international analysis is accessible for everyone

Link to the website: https://elordenmundial.com/

Why is relevant: El Orden Mundial (EOM) exemplifies the power of explanatory journalism by successfully translating complex geopolitical and international data into highly accessible narratives and visual formats. This initiative perfectly aligns with the core objectives of the DAPHnE project by demonstrating the practical application of *Visualization & Content Production* and *Communication & Storytelling*. By heavily relying on information design—particularly through the creation of detailed, context-rich maps and infographics—EOM shows how data can be used not just to report facts, but to provide deep contextual understanding to a broad audience. Furthermore, their successful transition from a specialized blog to a sustainable, subscription-based media outlet provides a strong educational model for the *Business & Strategy* competency group, illustrating viable journalism business models and content strategies for niche digital media in the modern landscape.

3.4 Best Practice 4

Description: The selected document is a good practice guide developed by the Politecnic University of Valencia, titled "Guía de Buenas Prácticas para Periodistas de Datos". This file offers journalists a set of tools and recommendations to incorporate data and statistical analysis in their storytelling and visualization practices, providing a basic conceptual framework, a step-by-step guide on how to find reliable and open databases and portals, and how to ensure the transparency of the sources of information. Additionally, it includes guidelines for converting the collected data into honest, powerful stories.

Link to the website: https://ctranspaupv.com/wp-content/uploads/2024/02/AF_GuiaPeriodistas_anexoVI.pdf

Why is relevant: The "Guía de Transparencia para Periodistas" (Transparency Guide for Journalists) serves as a fundamental educational resource that directly addresses the *Media, Ethics & Governance* and *Data Journalism & Investigation* skill groups. This guide provides a structured, practical methodology for navigating legal frameworks, specifically focusing on Freedom of Information (FOI) laws and the ethical access to public records. For the DAPHnE project, resources like this act as critical templates for Higher Education and VET curricula, as they bridge the gap between theoretical legal knowledge and the applied research skills needed in daily investigative work. It emphasizes that before data can be analyzed or visualized, professionals must possess the critical literacy and legal grounding to ethically source public data, thereby reinforcing journalism fundamentals and data privacy standards.

3.5 Best Practice 5

Description: The selected Good Practice is an article published by Raúl Sánchez, a prestigious data journalist, in the Spanish digital newspaper "elDiario.es". Titled "El dominio histórico de la derecha en Madrid" (The right's long-standing dominance in Madrid), this research article analyses the historical dominance of right-wing politicians in the capital city of Spain, using sophisticated official data and statistical analysis techniques. The first part of the article shows an interactive map which changes and evolves as the reader scrolls down the webpage, paired with small explanatory bubbles. The second part of the article combines a more in-depth narrative explanation with additional graphs.

Link to the website: https://www.eldiario.es/madrid/gana-derecha-elecciones-madrid-mayoritaria-30-rico_1_7347696.html

Why is relevant: The electoral data analysis piece published by eldiario.es exemplifies the high-impact potential of combining *Data & Analytics* with *Data Journalism & Investigation*. By cross-referencing granular, street-level election results with demographic and income data, this practice demonstrates how to extract meaningful sociological narratives from complex public datasets. For the DAPHnE project, this serves as a prime case study in *Visualization & Content Production*, showcasing how interactive maps and data visualizations can make dense statistical correlations accessible to the general public. It underscores the necessity for modern journalists to master not only data scraping and statistical analysis but also the visual storytelling techniques required to explain complex democratic and social processes effectively.

3.6 Best Practice 6

Description: Jaime Serra Palou is a renowned Spanish journalist who specializes in data journalism and visualization through infographics. In the website included for this good practice, one can access different creations (both journalistic and artistic) by the mentioned

author and, most importantly, his free online course "Infografía Periodística: Del explicar al narrar" (Journalistic Infograph: From Explaning to Narrating). Co-developed by the RTVE Training Institute, this 11-lesson course can be accessed through the journalist's own website, combining 15-minute explanatory videos developed by Serra himself, a small text describing each lesson, and additional resources. The lessons include, but are not limited to: an introduction to the infographic technique in journalism, the strengths and weaknesses of this method, and the collection and selection of reliable data.

Link to the website: https://www.archivosjaimeserra.com/curso-infografa-periodstica-rtve

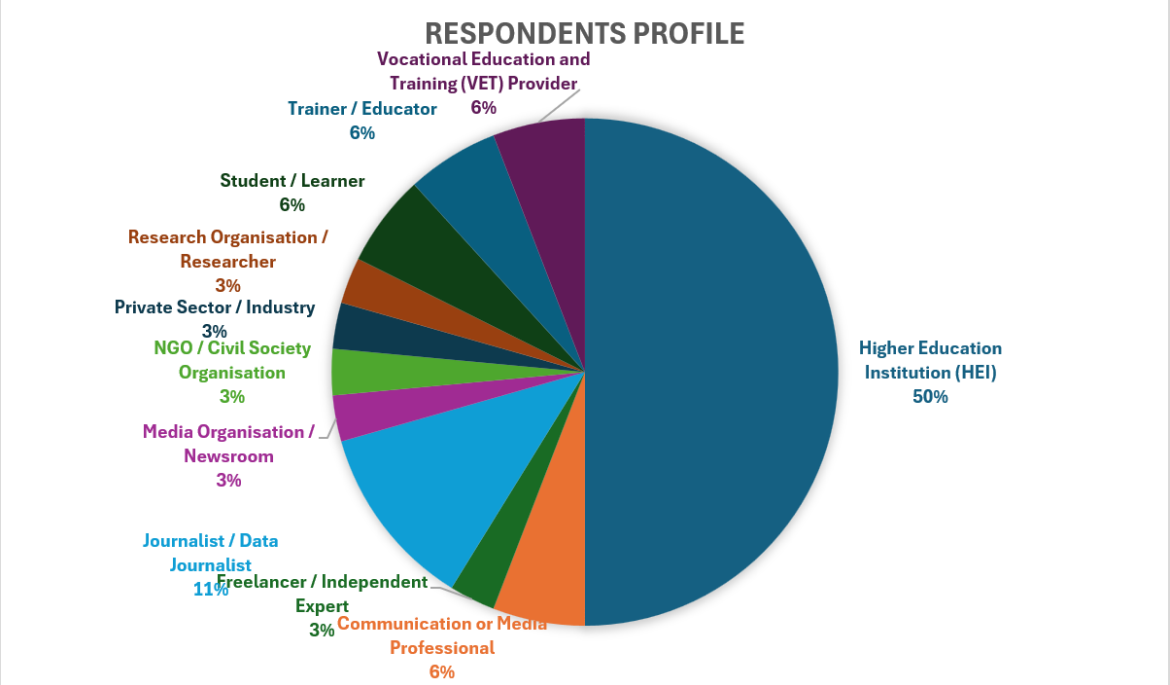
Why is relevant: The journalistic infographics course developed by Jaime Serra for RTVE stands out as a direct educational model highly relevant to the Visualization & Content Production and Communication & Storytelling competency groups. As a specialized training program designed for professionals within a major public broadcaster, it highlights the industry's internal demand for advanced information design skills. This practice is particularly valuable for the DAPHnE project because it transcends basic software training, focusing instead on visual thinking, conceptualization, and the authorial approach to data representation. Incorporating these pedagogical principles into Higher Education and VET curricula ensures that future professionals are equipped to transform abstract data into compelling, visually sophisticated journalistic narratives.

4 National Survey Results

This section presents the analysis of the quantitative data collected through the official DAPHnE project survey (available via EUSurvey: Daphne-EUProject). For the Spanish national context, a sample of 34 responses was gathered from professionals, educators, and industry stakeholders. The results analyzed in the following subsections focus on the responses to the key questions of this questionnaire, which were specifically designed to assess the perceived importance and current demand for the nine occupational competency groups identified during the research phase (such as *Data & Analytics*, *Data Journalism & Investigation*, *Visualization & Content Production*, among others). This quantitative analysis provides a data-driven overview of the training priorities and the specific needs of the Spanish labor market in the field of data journalism.

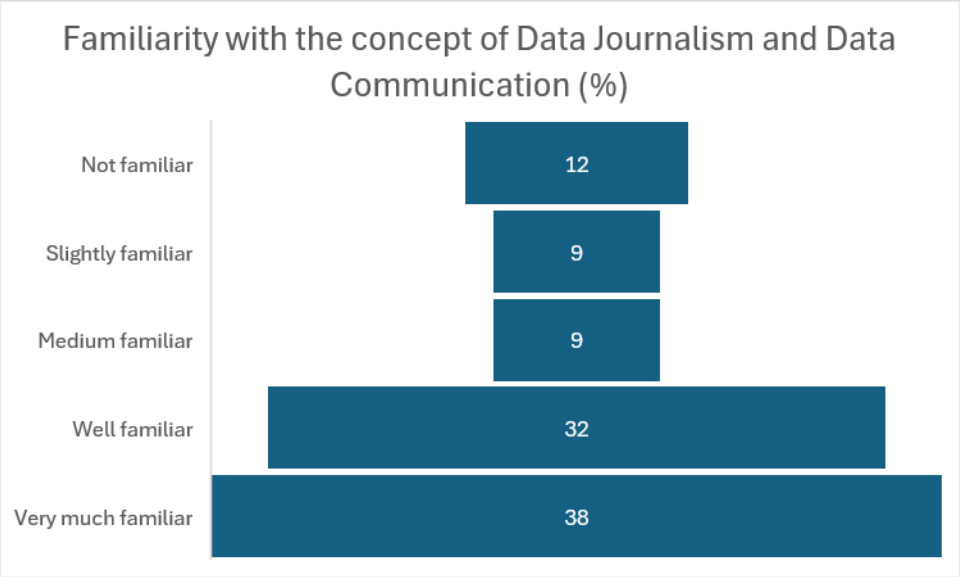
Checking the sample in Figure 1, we can observe that is a well-balanced representation between the active media industry and the educational sector, which ensures a comprehensive overview of both current labor market demands and academic training realities.

Figure 1. Respondents profile



Regarding the respondents familiarity with the concept of Data Journalism and Data Communication personal perception, most of them answered that they are well familiar or very much familiar, representing 70% of total responses, as can be observed in Figure 2.

Figure 2. Familiarity with the concept

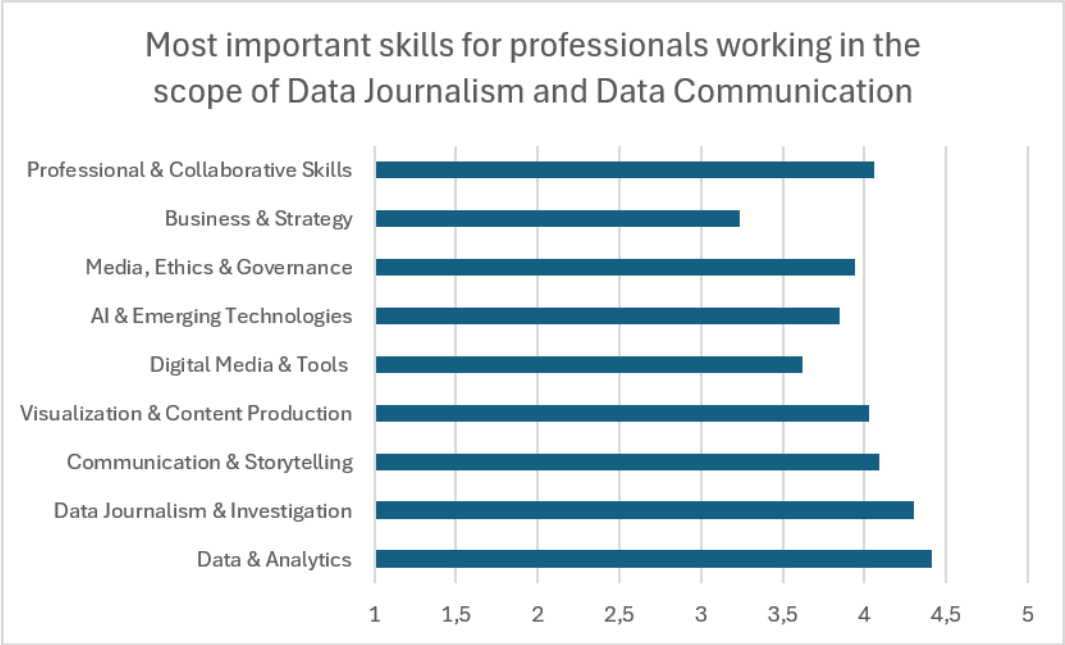


Regarding the analysis of the importance of the different skills groups, there were two different complimentary questions in the survey. Analysing the responses we can extract:

- Top-Tier Priorities: Data Journalism & Investigation ranks as the absolute highest priority, achieving a near-perfect average score of 4.56. It is closely followed by Media, Ethics & Governance and Communication & Storytelling, both tied at an impressive 4.47. These figures indicate a widespread consensus that investigative rigor, ethical frameworks, and narrative capabilities are the most critical assets for professionals in Spain.
- Core Baseline Skills: A solid middle tier consists of competencies that all scored comfortably above 4.0, marking them as highly important standard requirements. This includes Professional & Collaborative Skills (4.41), Visualization & Content Production (4.38), Digital Media & Tools (4.21), and Data & Analytics (4.18).
- Secondary Priorities: While still valued as important (scoring above 3.0), AI & Emerging Technologies (3.79) and Business & Strategy (3.47) recorded the lowest average scores. This confirms the previous finding that respondents currently view artificial intelligence and business modeling as secondary or specialized priorities compared to immediate journalistic and data-processing foundations.

These results can be observed in the Figure 3.

Figure 3. Importance of the skills groups for the professionals



To complement the quantitative analysis, the survey included an optional open-ended question inviting participants to share additional perspectives or identify knowledge groups they felt were missing from the initial proposal. The qualitative responses obtained were highly enriching and reveal several key areas that professionals consider indispensable for the current practice of data journalism.

The main findings extracted from this section are grouped into the following themes:

- Respondents unanimously emphasized that "critical thinking is the most important skill." Special emphasis was placed on the need for *applied statistical literacy*, which goes beyond simply using software and includes the critical interpretation of quantitative data, the detection of methodological biases, and the distinction between causality and correlation. As one participant noted, without a solid humanistic and reflective foundation, technical tools can produce journalism that is "technically sophisticated but informatively misleading."
- Although ethics were already included, participants stressed the need to delve specifically into Information Law and relevant legal regulations. This includes navigating editorial lines, defending freedom of expression, and handling the complex challenges of censorship and self-censorship.
- Another major contribution was the need to include audience-oriented competencies. This encompasses audience analysis, community engagement, and media and information literacy. Respondents highlighted the importance of knowing how to adapt data-driven content to different user profiles as a fundamental tool for combating misinformation and disinformation.
- There was a highlighted need to foster working methodologies that integrate a rigorous evaluation of sources and close collaboration with other areas and specialties of traditional journalism, ensuring that data teams do not work in isolated silos.

5 Expert Interviews

Following the initial desk research and the quantitative analysis of the national survey, a series of targeted interviews with national industry experts were conducted. The primary and most critical purpose of these interviews is to rigorously validate the occupational and competency groups identified in the previous phases. While these in-depth consultations also serve to complement the existing data—providing deeper qualitative context, expanding on specific nuances, and exploring the actual panorama—their fundamental objective remains validation of previous findings.

For Spain, 3 interviews were conducted by DEFOIN partner. The most relevant information extracted from the interview was as indicated in the next subsections.

5.1 Interview 1

Full Name: <Anonymized data>

Organization/Role: NGO/Coordinator of the Communications Department

Conclusions: In the interview with <Anonymized data>, the discussion centered heavily on the intersection of critical thinking, narrative skills, and technology. She emphasized that the

critical use of AI is unavoidable and must be integrated into daily workflows, but she strictly separated it from the human aspect of storytelling. According to her, storytelling relies entirely on personal judgment, acquired professional skills, and individual motivation—elements that artificial intelligence cannot replace. Looking ahead to the industry's needs over the next five years, she identified *Data & Analytics*, *Communication & Storytelling*, and *Media, Ethics & Governance* (as a cross-cutting theme) as the three most critical competency areas. Her insights suggest that while technological proficiency is necessary, the core value of a professional lies in their ethical grounding and their ability to effectively communicate complex data-driven narratives to the public.

5.2 Interview 2

Full Name: <Anonymized data>

Organization/Role: Training - VET Provider / Officer of Communication

Conclusions: During the interview with <Anonymized data>, the conversation highlighted the practical skill gaps observed among professionals entering the field, particularly those from Vocational and Educational Training (VET) backgrounds. She pointed out a significant deficiency in the effective use of emerging technologies, notably Artificial Intelligence. While AI is increasingly present in daily tasks, it is often underutilized as a true strategic tool, indicating that professionals need deeper training on its proper application and potential. Additionally, she identified a major gap in the basic treatment and understanding of data, observing that individuals frequently struggle with knowing how to correctly manage, analyze, and apply the information they investigate. To overcome these structural challenges, she strongly emphasized the necessity of an open mindset and a commitment to continuous, lifelong learning as the key to adapting to a constantly changing landscape.

5.3 Interview 3

Full Name: <Anonymized data>

Organization/Role: Academia / Lecturer, Faculty of Journalism, <Anonymized data>

Conclusions: The interview with <Anonymized data> provided deep insights into both the methodological rigor and the civic responsibility required in modern data journalism. A central theme of her contribution is the conceptualization of data journalism as a "tool for citizenship" rather than mere readership. She praised models such as the RTVE data unit, emphasizing that data should serve the public by empowering them to make informed decisions—ranging from simple daily choices to complex democratic actions, such as voting. On a practical and methodological level, she highlighted a critical procedural gap: the necessity to "always check the metadata first". She strongly advocated that before any analysis takes place, professionals must be trained to interrogate how a dataset was obtained, as understanding its origins is the only way to establish trust in the information. Furthermore, she pointed out the importance of identifying data absences. According to her, realities that

are not quantified or measured represent a significant gap that journalists must learn to recognize and, where possible, actively address by building their own datasets. Her insights underscore that technical competency must always be coupled with rigorous source verification and a profound commitment to public service.

6 Conclusions

The preparation of this National Report, framed within the DAPHnE project, reveals a clear convergence between the best practices analyzed, the results of the quantitative survey, and the qualitative validations by the experts. Altogether, the findings demonstrate that data journalism and communication in the current context demand a holistic approach that goes beyond mere technical training. While the management of digital tools, data processing, and adaptation to emerging technologies such as Artificial Intelligence are considered necessary, the sector overwhelmingly prioritizes foundational competencies: investigative rigor (*Data Journalism & Investigation*), critical thinking, statistical literacy, and solid ethical and legal frameworks (*Media, Ethics & Governance*). Likewise, the ability to translate complex datasets into accessible visual and written narratives (*Communication & Storytelling* and *Visualization*) is consolidated as an inescapable skill to empower citizens and combat disinformation. Ultimately, to close the detected gap between formal education (both in Higher Education and Vocational Education and Training) and the real demands of the labor market, future curricula must opt for practical methodologies ("learning by doing"), fostering continuous learning, interdisciplinary collaboration, and a profound vocation for public service based on transparency.


DAPHNE

DAPHNE

National Report (Italy)

University of Rome Tor Vergata

WP2

Project and document Information:

Work package: WP2

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Task leaders:

University of Rome Tor Vergata

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Authors: Daniele Pasquini, Paola Vocca

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3 Best practices analysis

Italy has developed a diverse ecosystem of initiatives that promote data journalism, open data, and evidence-based communication across the media, public administration, and civil society sectors. The selected best practices illustrate complementary approaches to strengthening data literacy and responsible data communication, ranging from mainstream newsrooms and investigative journalism to civic technology organizations and national open data infrastructures. Together, these initiatives demonstrate how data can be collected, analysed, visualized, and communicated to enhance transparency, accountability, public participation, and informed decision-making. As such, they provide valuable examples of the competencies and practices that the DAPHnE project aims to foster among journalists and communicators in the digital age.

3.1 Best Practice 1

Description: Info Data is the data journalism section of *Il Sole 24 Ore*, Italy's leading financial newspaper. Since 2013, it has produced data-driven stories supported by interactive visualizations, infographics, and statistical analysis covering topics such as economics, demographics, health, education, sustainability, and public policy. The platform combines journalistic expertise with data analysis to make complex information accessible to both professionals and the general public.

Link to the website: https://www.infodata.ilsole24ore.com

Why is relevant: Info Data is highly relevant to the DAPHnE project because it represents one of the earliest and most established examples of data journalism within the Italian mainstream media. The initiative demonstrates how data analysis, visualization, and evidence-based storytelling can improve public understanding of complex societal issues and promote informed decision-making. By transforming official datasets into accessible narratives through interactive visualizations and clear explanations, Info Data contributes to strengthening data literacy, fostering critical thinking, and encouraging responsible communication based on reliable evidence. It also serves as a benchmark for the integration of data journalism practices into professional journalism and public communication in Italy.

3.2 Best Practice 2

Description: dati.gov.it is Italy's national open data portal, managed by the Department for Digital Transformation of the Presidency of the Council of Ministers. It provides a centralized catalogue of open datasets published by national, regional, and local public

administrations, covering a wide range of domains including public spending, healthcare, environment, transport, education, and public administration. The portal promotes transparency, data accessibility, and the reuse of public information by citizens, journalists, researchers, and developers.

Link to the website: https://www.dati.gov.it/

Why is relevant:

dati.gov.it is highly relevant to the DAPHnE project because it provides the open data infrastructure that enables evidence-based journalism and data-driven communication in Italy. By offering free access to authoritative public datasets, the portal supports journalists and communicators in producing accurate, transparent, and verifiable reporting on issues of public interest. As Italy's implementation of the EU Open Data Directive, it fosters data literacy, civic participation, and the responsible reuse of public information, while encouraging the development of analytical and critical thinking skills that are essential for modern data journalism.

3.3 Best Practice 3

Description: **Openpolis** is an independent civic technology foundation that collects, analyses, and publishes open data on Italian politics, public administration, public spending, and institutional transparency. Through projects such as *Open Bilanci*, *Open Parlamento*, and *Open PNRR*, it provides interactive visualizations, searchable databases, and data-driven analyses that enable journalists, researchers, and citizens to monitor government activities and the use of public resources. By combining open data with accessible communication, Openpolis promotes transparency and accountability in public life.

Link to the website: https://www.openpolis.it/

Why is relevant: **Openpolis** is highly relevant to the DAPHnE project because it demonstrates how open data, data journalism, and digital communication can be integrated to strengthen transparency, civic engagement, and evidence-based public debate. By transforming complex institutional and financial data into accessible analyses and interactive visualizations, the platform supports journalists and citizens in understanding public policies, monitoring government performance, and promoting accountability. Openpolis also represents an excellent example of how data literacy and responsible communication can empower society, making it a valuable reference for developing the competencies addressed by the DAPHnE project.

3.4 Best Practice 4

Description: **onData APS** is a non-profit association dedicated to promoting open data culture and civic technology in Italy. The organization supports transparency, participation,

and the responsible reuse of public data by developing open datasets, open-source tools, practical guides, and training initiatives for journalists, researchers, public administrators, and citizens. Through advocacy activities and collaborative projects, onData encourages public institutions to make data more accessible and reusable while fostering a culture of evidence-based communication.

Link to the website: https://ondata.it/

Why is relevant:

onData APS is highly relevant to the DAPHnE project because it promotes the competencies required for responsible data journalism through a combination of open data advocacy, digital tools, and educational activities. By providing practical resources for accessing, analysing, and communicating public data, the organization helps journalists and communicators develop stronger data literacy and evidence-based reporting skills. Its commitment to transparency, civic participation, and open knowledge also demonstrates how collaboration between civil society, public institutions, and the media can strengthen accountability and support informed public debate, making it an excellent example of best practice in the Italian context.

3.5 Best Practice 5

Description: info.nodes is a non-profit organization founded by journalists and activists that promotes investigative journalism, digital rights, and civic engagement through interdisciplinary collaboration. The organization focuses on issues such as social and climate justice, the impact of emerging technologies on human rights, and freedom of expression. Its activities include investigative reporting, technical training for journalists and activists, networking initiatives, and the development of innovative communication formats that combine journalism, research, and digital technologies.

Link to the website: https://www.infonodes.org/

Why is relevant: info.nodes is highly relevant to the DAPHnE project because it demonstrates how investigative journalism can be strengthened through digital competencies, interdisciplinary collaboration, and evidence-based communication. By providing training, fostering collaboration between journalists, researchers, technologists, and civil society organizations, and promoting innovative storytelling approaches, the organization contributes to developing the skills needed to investigate complex societal issues in the digital age. Its focus on human rights, freedom of expression, and the responsible use of technology aligns closely with DAPHnE's objective of empowering journalists and communicators to critically analyse, interpret, and communicate data while promoting informed public debate and media literacy.

3.6 Best Practice 6

Description:

DataRoom is the investigative data journalism section of *Corriere della Sera*, one of Italy's leading national newspapers, led by renowned journalist Milena Gabanelli. Since its launch in 2018, DataRoom has combined investigative reporting with official datasets, document analysis, fact-checking, and data visualization to explain complex political, economic, environmental, healthcare, and social issues. Through evidence-based storytelling, it transforms complex information into clear and accessible narratives for a broad audience.

Link to the website: https://www.corriere.it/dataroom/

Why is relevant:

DataRoom is highly relevant to the DAPHnE project because it demonstrates how data journalism can strengthen investigative reporting and promote evidence-based public discourse. By integrating official statistics, documentary evidence, rigorous fact-checking, and visual storytelling, the initiative helps citizens better understand complex societal challenges while fostering transparency, accountability, and media literacy. DataRoom represents one of the most influential examples of investigative data journalism in Italy and illustrates how journalists can effectively combine analytical skills, responsible data interpretation, and accessible communication to support informed public debate.

4 National Survey Results

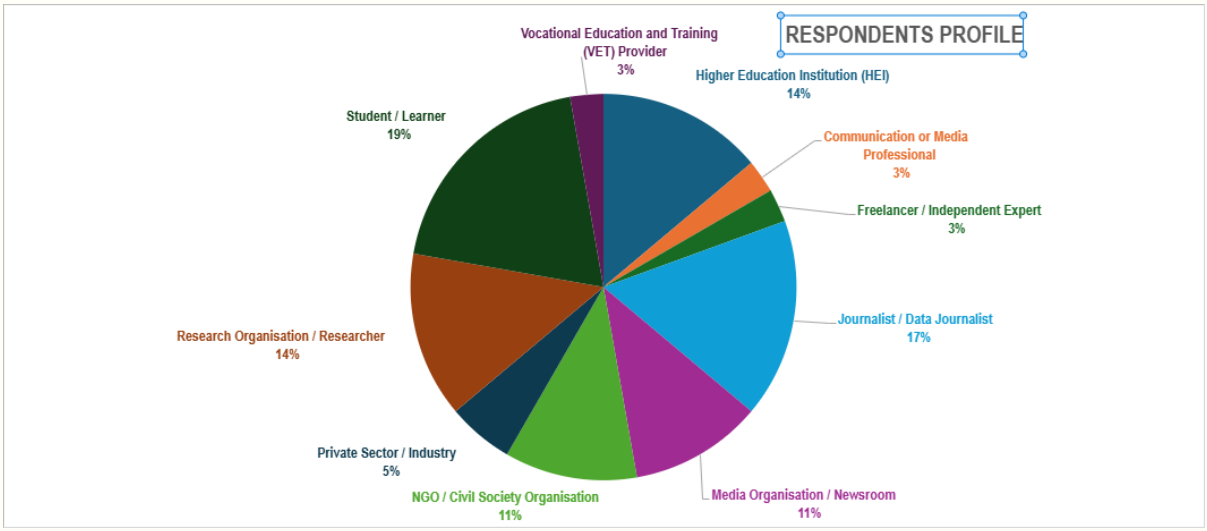
This section presents the analysis of the quantitative data collected through the official DAPHnE project survey (available via EUSurvey: Daphne-EUProject). For the Italian national context, responses were collected from professionals, educators, researchers, students, and stakeholders involved in journalism, communication, media, and higher education. The following analysis focuses on the key questions designed to assess the perceived importance of the nine competency groups identified during the research phase. The results provide an overview of the current priorities and skills considered essential for data journalism and data communication in Italy.

Respondents' profile

As shown in Figure 1, the Italian sample reflects a multidisciplinary community composed of journalists, higher education institutions, researchers, media organizations, NGOs, students, and representatives from the private sector. Journalists and students constitute the largest groups of respondents, followed by representatives from higher education institutions,

research organizations, media organizations, and civil society. This heterogeneous distribution provides a balanced perspective by combining academic, professional, and educational viewpoints, which is particularly valuable for identifying both current labour market needs and future training priorities.

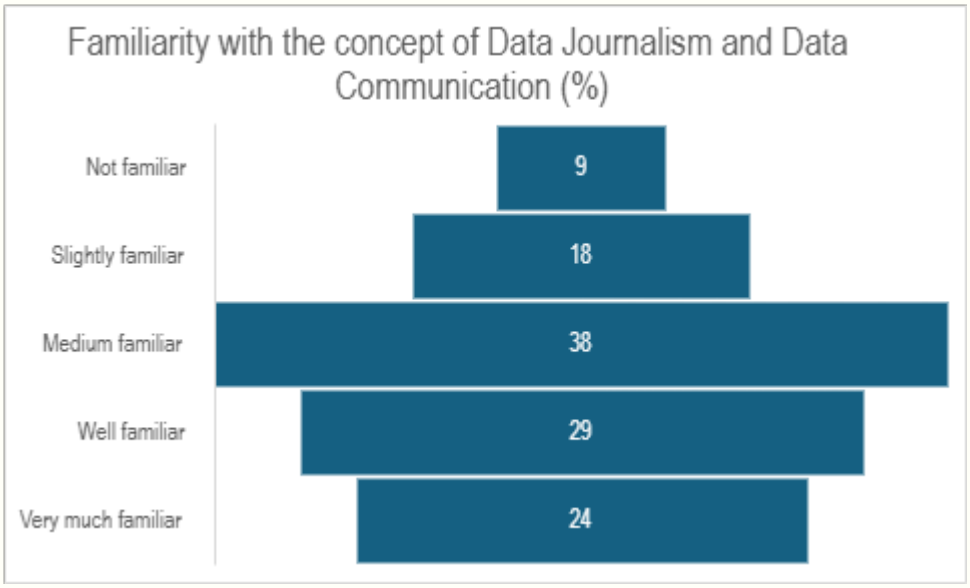
Figure 1. Respondents profile



Familiarity with Data Journalism and Data Communication

The respondents reported a generally high level of familiarity with the concepts of Data Journalism and Data Communication. As illustrated in Figure 2., the majority declared themselves to be **moderately, well, or very familiar** with these concepts, while only a relatively small proportion indicated little or no familiarity. This finding suggests that the survey successfully reached participants who already possess a solid understanding of the field, increasing the reliability of their assessment of the proposed competencies.

Figure 2. Familiarity with the concept



Importance of the competency groups

The survey asked respondents to evaluate the importance of the nine competency groups identified by the DAPHnE project. The Italian results reveal a clear preference for competencies directly related to journalistic practice and the critical use of data.

Top-tier priorities. The highest-rated competency group is **Data Journalism & Investigation** (4.52), confirming that respondents consider investigative methods and evidence-based reporting as the cornerstone of modern journalism. This is followed by **Data & Analytics** (4.43) and **Communication & Storytelling** (4.29), highlighting the importance of both analytical capabilities and the ability to communicate complex information clearly and effectively.

Core professional competencies. A second group of highly valued competencies includes **Visualization & Content Production** (4.14), **Media, Ethics & Governance** (4.00), and **Professional & Collaborative Skills** (3.93). These results indicate that respondents recognize the importance of visual communication, ethical responsibility, and interdisciplinary collaboration as fundamental elements of professional data journalism.

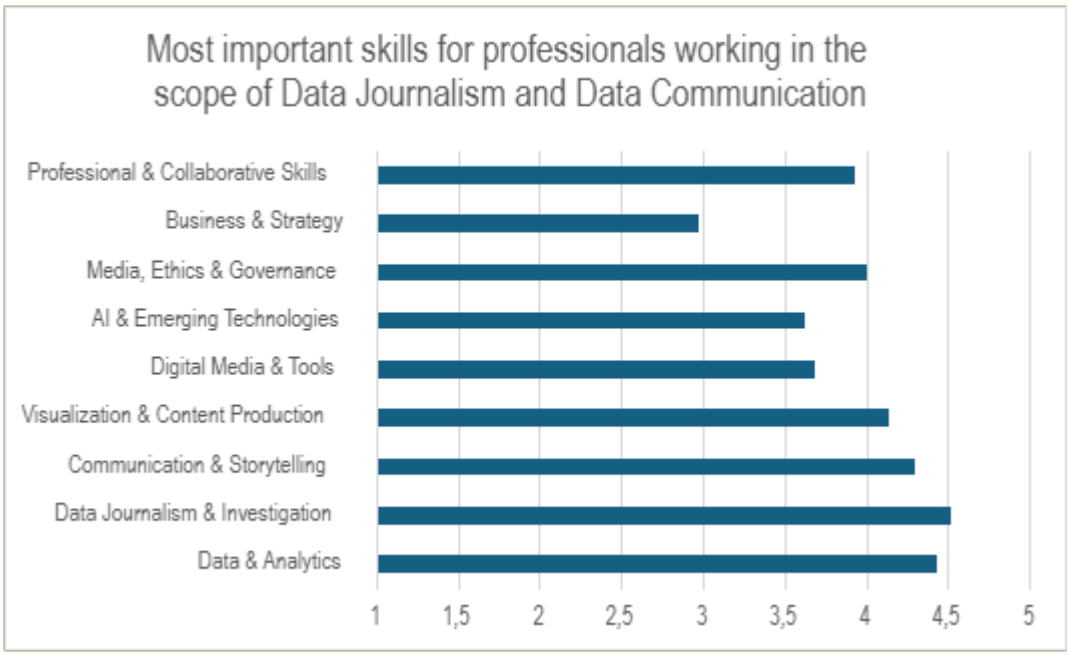
Emerging and supporting competencies. Competencies related to **Digital Media & Tools** (3.68) and **AI & Emerging Technologies** (3.62) also received positive evaluations, although they are perceived as supporting rather than central competencies. This suggests that Italian professionals acknowledge the growing importance of artificial intelligence and digital technologies, while

still considering traditional journalistic, analytical, and communication skills as the primary foundations of the profession.

Finally, **Business & Strategy** obtained the lowest average score (2.98), indicating that managerial and business-related competencies are currently perceived as less relevant compared with editorial, analytical, and ethical competencies.

These results can be observed in the Figure 3.

Figure 3. Importance of the skills groups for the professionals



Open-ended responses

The qualitative responses collected through the open-ended question reinforce the quantitative findings. Participants repeatedly emphasized that technical competencies should always be accompanied by **critical thinking**, **ethical responsibility**, and the ability to interpret data within their broader social and political context. Respondents highlighted that data should not simply be collected and visualized but critically analysed and transformed into meaningful narratives that support informed public debate.

Another recurring theme concerns the growing importance of **data literacy** and **statistical reasoning**, which are considered essential for avoiding misinterpretation and communicating evidence accurately. Several respondents also stressed the need for stronger competencies in **privacy protection**, **cybersecurity**, and the responsible use of artificial intelligence, reflecting the increasing digitalisation of journalistic practice.

Finally, participants underlined the value of interdisciplinary collaboration between journalists, data analysts, communication specialists, and researchers, recognising that effective data journalism increasingly requires teams with complementary expertise rather than isolated technical skills.

5 Expert Interviews

Following the desk research and the quantitative analysis of the national survey, the Italian DAPHnE consortium conducted a series of expert interviews to validate and refine the proposed Data Journalism and Data Communication Competency Framework. The interview campaign involved both **Italian professionals** and **international experts** interviewed by the Italian partners, providing complementary perspectives from journalism, media organisations, civic technology, public administration, consultancy, research, and the private sector.

The interviews pursued two main objectives. First, they aimed to assess the relevance and completeness of the competency framework developed during the previous phases of the project, identifying possible refinements and emerging competency needs. Second, they explored current professional practices, future trends, and the skills gaps observed among professionals entering the field.

While the interviews conducted with Italian experts provide insights into the current state of data journalism and data communication in Italy, the international interviews contribute a broader European perspective, allowing the competency framework to be validated across different professional and national contexts. Together, these interviews offer a comprehensive qualitative assessment of the competencies required by the evolving data journalism ecosystem.

The following sections summarise the main findings of each interview, highlighting the distinctive perspectives of the interviewees while identifying recurring themes that will be discussed in the final cross-cutting analysis.

5.1 International Expert Interviews – OBCT/CCI

The interviews conducted by **OBCT/CCI** involved three internationally recognised experts from leading European news organisations and investigative journalism initiatives: <Anonymized data>.

Their contributions offer a broader European perspective on the evolving competencies required in the profession, particularly regarding the impact of artificial intelligence, the role of critical thinking, ethical responsibility, investigative methods, and interdisciplinary collaboration. These insights complement the interviews conducted with Italian experts by helping to assess the relevance and applicability of the competency framework beyond the national context.

5.1.1 Interview 1- OBCT/CCI

Full Name: <Anonymized data>

Organization/Role: <Anonymized data>/ Head of the Data-Driven Journalism Team

Conclusions: The interviewee broadly agrees with the proposed competency framework, while recommending some refinements to better reflect professional newsroom practice. In particular, she argues that the meaning of **Communication** should be clarified or partially incorporated into **Professional & Collaborative Skills**. She also recommends expanding the storytelling dimension to include the ability to configure and adapt data-driven narratives to different media platforms and formats.

Her perspective strongly emphasises the centrality of **Data Journalism & Investigation**, **Data & Analytics**, and **Communication & Storytelling**. However, she also assigns considerable importance to professional collaboration, reflecting the multidisciplinary nature of contemporary data journalism teams. By contrast, Business & Strategy is considered less directly relevant to practitioners' everyday editorial work.

A central theme of the interview is the risk of professional **deskilling** caused by an uncritical reliance on artificial intelligence. The interviewee observes that journalists without a technical background are increasingly attempting to perform data analysis through AI tools without fully understanding their capabilities, limitations, or potential errors. For this reason, critical thinking, quality control, and the ability to audit and validate AI-generated results will become essential professional competencies. AI should not replace foundational analytical knowledge; instead, journalists need sufficient technical understanding to verify automated outputs, code, and data-processing workflows.

The interview identifies similar skills gaps among graduates from different educational pathways. These include weak basic data-analysis abilities, insufficient verification diligence, and a tendency to seek automated or simplified solutions to complex analytical tasks. New professionals often lack practical proficiency in basic tools such as spreadsheets and programming languages, which are needed not only for conducting analyses but also for checking AI-generated code and data pipelines. Another significant gap is conceptual: many graduates mistakenly equate the inclusion of numbers or simple charts in an article with

genuine data journalism. The interviewee therefore stresses the importance of developing a broader analytical mindset based on investigation, verification, methodological rigour, and critical interpretation.

Overall, the interview suggests that future training should combine practical data-analysis skills with AI literacy, verification methods, critical thinking, and platform-specific storytelling. Particular attention should be paid to ensuring that journalists retain the capacity to understand and independently evaluate the analytical processes that increasingly support newsroom production.

Ranking of the competency areas

- Data Journalism & Investigation
- Data & Analytics
- Communication & Storytelling
- Visualization & Content Production
- Professional & Collaborative Skills
- Digital Media & Tools
- AI & Emerging Technologies
- Media, Ethics & Governance
- Business & Strategy

5.1.2 Interview 2– OBCT/CCI

Full Name: <Anonymized data>

Organization/Role: Data Journalist, <Anonymized data>

Conclusions

The interviewee generally agrees with the proposed competency framework but argues that its structure could be simplified to better reflect the actual workflow of data journalists. In his view, several competency groups overlap conceptually and could be merged. In particular, he suggests integrating **Data Journalism** within **Data & Analytics**, treating **Investigation** as a distinct competency, combining **Communication & Storytelling** with **Visualization & Content Production**, and consolidating the broader categories of **Digital Media & Tools** and **Professional & Collaborative Skills** into a single domain.

Regarding the relative importance of the competencies, the interviewee considers **Data & Analytics** and **Investigation** to be the foundations of professional practice. At the same time, he believes that **AI & Emerging Technologies** is currently underestimated and will

become one of the fastest-growing competency areas. Conversely, although **Business & Strategy** is consistently ranked among the least important competencies by practitioners, he observes that it deserves greater attention because it directly affects the sustainability of journalistic organisations.

Looking ahead, the interviewee expects artificial intelligence to significantly expand journalists' technical capabilities, enabling professionals to perform tasks that previously required specialised programming or data science expertise. Rather than reducing the role of journalists, however, AI will increase the importance of editorial judgement, source verification, fact-checking, and the ability to determine which stories deserve investigation and how data should be interpreted. As technical barriers decrease, professional experience and critical judgement will become the principal factors distinguishing expert journalists from less experienced practitioners.

Concerning skills gaps, the interviewee argues that current university education still provides limited preparation in data journalism. Beyond technical competencies, newcomers frequently lack the methodological reasoning required to translate journalistic questions into structured analytical workflows, combining appropriate data sources, investigative techniques, and analytical methods. According to the interviewee, the greatest gap is therefore not storytelling itself, but the combination of critical thinking, investigative reasoning, and analytical judgement that enables journalists to transform data into meaningful public-interest reporting. Future education should strengthen these competencies while integrating data journalism more systematically into journalism curricula.

Ranking of the competency areas

- Data & Analytics
- Visualization & Content Production
- Data Journalism & Investigation
- Communication & Storytelling
- AI & Emerging Technologies
- Professional & Collaborative Skills
- Digital Media & Tools
- Business & Strategy
- Media, Ethics & Governance

5.1.3 Interview 3 – OBCT/CCI

Full Name: <Anonymized data>

Organization/Role: Data Journalist, <Anonymized data>

Conclusions

The interviewee considers the proposed competency framework to be comprehensive and well structured, requiring only limited refinements. Rather than merging or removing competency groups, she recommends making programming competencies more explicit, as they are currently embedded within **Data & Analytics** and **Digital Media & Tools** despite being increasingly important for data analysis, visualization, and the management of large datasets.

A central message throughout the interview is that the growing adoption of artificial intelligence fundamentally changes the balance between technical and human competencies. While AI is expected to facilitate many technical tasks—including data analysis, visualization, fact-checking, and investigative support—the interviewee argues that this evolution increases rather than reduces the importance of critical thinking, ethical awareness, and professional judgement. As AI becomes integrated into everyday newsroom workflows, journalists must be able to understand its limitations, recognise hallucinations and biases, and critically evaluate automated outputs before incorporating them into editorial work.

The interviewee therefore believes that **Professional & Collaborative Skills** and **Media, Ethics & Governance** deserve greater prominence within the competency framework than suggested by the survey results. In her view, technical expertise alone is insufficient; responsible decision-making and ethical supervision will become increasingly important as AI systems assume a larger share of routine analytical tasks. At the same time, **Data Journalism & Investigation** and **Data & Analytics** remain the core competencies of the profession, providing the methodological foundations upon which AI-supported workflows should be built.

Regarding current skills gaps, the interviewee observes that many graduates possess a reasonable technical background but still lack advanced programming skills and, more importantly, the ability to transform analytical results into compelling journalistic narratives. She also highlights the importance of maintaining strong statistical literacy and conceptual understanding, since professionals who rely exclusively on AI without understanding the underlying analytical processes are unable to effectively validate or challenge automated outputs. Future education should therefore integrate technical training with programming, storytelling, critical thinking, and ethical competencies, preparing journalists not only to use AI tools but also to supervise them responsibly.

Ranking of the competency areas

- Data Journalism & Investigation
- Data & Analytics

- Visualization & Content Production
- AI & Emerging Technologies
- Media, Ethics & Governance
- Communication & Storytelling
- Professional & Collaborative Skills
- Digital Media & Tools
- Business & Strategy

5.2Italian Expert Interviews

The following interviews were conducted with Italian professionals representing a wide range of organisations, including national and regional media, independent journalism, civic technology organisations, public administration, consultancy firms, and the private sector. Unlike the previous section, these interviews specifically reflect the Italian ecosystem of data journalism and data communication, providing direct evidence of the competencies, challenges, and emerging trends observed within the national context.

5.2.1 Interview 4 – DATAPITCH

Full Name: <Anonymized data>

Organization/Role: Freelance Journalist, Founder and Director of <Anonymized data>

Conclusions

The interviewee broadly agrees with the proposed competency framework while suggesting several refinements to better reflect the methodological foundations of data journalism. His main observation concerns the relatively low ranking assigned to **Media, Ethics & Governance**, which he considers one of the core competencies for any professional working with data. In his view, ethics should not be regarded as a complementary skill but as a fundamental principle guiding every stage of data collection, verification, interpretation, and communication. Similarly, he argues that **fact-checking** should be understood primarily as an ethical and methodological responsibility rather than as a component of investigative journalism. He also suggests renaming **Data Journalism & Investigation** simply as **Investigation**, since investigative reasoning represents the real professional competency underpinning data-driven reporting. Finally, he believes that **Professional & Collaborative Skills** deserve greater recognition, given the increasingly interdisciplinary nature of investigative journalism.

Reflecting on the evolution of the profession, the interviewee identifies two long-term challenges that continue to shape data journalism. The first is the persistent difficulty of accessing reliable and well-structured public data, which remains one of the main obstacles to investigative reporting. The second is the continuous need for journalists to update their technical competencies as analytical tools rapidly evolve. While artificial intelligence and new digital technologies are significantly reducing technical barriers—making tasks such as extracting structured information from complex documents much faster—they also require continuous professional development. According to the interviewee, data journalism is no longer a niche specialisation but has become an essential component of quality journalism. As a result, all journalists should acquire a basic level of data literacy to critically analyse and use data in their reporting.

Regarding current skills gaps, the interviewee highlights an increasingly evident imbalance between technical and narrative competencies. Younger journalists generally demonstrate stronger analytical and digital skills, whereas more experienced professionals often excel in writing and storytelling. However, many data-driven investigations fail to communicate their findings effectively because analytical results are presented in an overly technical or academic manner. Future education should therefore aim to integrate data analysis, investigative methods, and digital tools with strong storytelling abilities, ensuring that complex evidence can be transformed into engaging, accessible, and socially relevant narratives. In his view, the future of data journalism will depend not only on mastering new technologies but also on preserving the journalistic capacity to communicate data in ways that inform, engage, and empower citizens.

Ranking of the competency areas

- Data Journalism & Investigation
- Media, Ethics & Governance
- Data & Analytics
- AI & Emerging Technologies
- Communication & Storytelling
- Visualization & Content Production
- Professional & Collaborative Skills
- Digital Media & Tools
- Business & Strategy

5.2.2 Interview 5 – DATAPITCH

Full Name: <Anonymized data>

Organization/Role: Former Journalist, <Anonymized data>

Conclusions

The interviewee approaches the competency framework from the perspective of a senior journalist who has witnessed the gradual integration of data-driven practices into mainstream journalism. Rather than considering data journalism a distinct professional specialisation, he argues that data competencies should now be regarded as a fundamental component of journalism itself. In his view, every journalist covering public affairs, health, the environment, or economics should possess a basic ability to collect, analyse, and interpret data, just as they are expected to verify sources or write clearly.

The interviewee believes that **Data & Analytics** should represent the core competency of the framework, followed by **Visualization**, which he considers a distinctive language of contemporary journalism. He therefore questions the current grouping of **Visualization & Content Production**, arguing that visualization is a specialised competency that deserves to stand on its own, whereas content production represents a broader journalistic activity common to all media professionals. He also considers **AI & Emerging Technologies** considerably more important than suggested by the survey results, describing artificial intelligence as a transformative enabling technology that supports virtually every stage of the journalistic workflow. Conversely, competencies such as **Communication & Storytelling** and **Professional & Collaborative Skills**, while undoubtedly important, should not define the distinctive profile of a data journalist since they are shared across journalism more generally.

Reflecting on the current state of journalism in Italy, the interviewee argues that the profession has been slow to embrace data-driven approaches. Traditional journalism has historically privileged opinion and narrative writing over empirical evidence, resulting in a limited use of data even in areas where quantitative information should play a central role. Although several specialised newsrooms have demonstrated the value of data journalism, these experiences have not yet significantly influenced mainstream editorial culture. In his view, one of the major challenges for the coming years will be making data literacy a standard professional competency rather than a niche expertise reserved for specialists.

Regarding skills gaps, the interviewee identifies a substantial cultural divide between journalists who routinely use digital tools and those who still perceive data analysis as an optional or highly specialised activity. Many professionals lack even basic familiarity with spreadsheets and other everyday analytical tools, making it difficult to incorporate data into routine reporting. According to the interviewee, future education should focus less on advanced technical expertise and more on ensuring that every journalist acquires a minimum level of data literacy, enabling them to confidently interpret, verify, and communicate evidence-based information in their daily work.

Ranking of the competency areas

- Data & Analytics
- Visualization & Content Production
- AI & Emerging Technologies
- Digital Media & Tools
- Media, Ethics & Governance
- Business & Strategy
- Data Journalism & Investigation
- Communication & Storytelling
- Professional & Collaborative Skills

5.2.3 Interview 6 – DATAPITCH

Full Name: <Anonymized data>

Organization/Role: President, <Anonymized data>

Conclusions

The interviewee generally agrees with the proposed competency framework but argues that the competencies should not be interpreted as isolated domains. Instead, they form an interconnected ecosystem in which effective data journalism depends on combining analytical, investigative, communicative, and organisational capabilities. For this reason, he considers ranking individual competencies useful only to a limited extent and suggests adopting a more integrated approach when designing educational programmes.

Among the proposed competency groups, the interviewee confirms **Data Journalism & Investigation**, **Data & Analytics**, and **Communication & Storytelling** as the essential foundations of the profession. However, he identifies several structural improvements to the framework. In particular, he recommends separating **Visualization** from **Content Production**, as these represent distinct professional competencies requiring different expertise. He also argues that **Business & Strategy** deserves significantly greater attention because the impact of data journalism ultimately depends on its ability to reach audiences and remain economically sustainable. Conversely, he suggests that **AI & Emerging Technologies** should no longer be treated as a standalone competency, since artificial intelligence is rapidly becoming an enabling technology embedded across virtually every aspect of journalistic work rather than a specialised skill in its own right.

Looking ahead, the interviewee emphasises that the future of data journalism will depend increasingly on **reproducibility, transparency, and structured collaboration**. He observes that many journalists still fail to publish their data sources or document their analytical workflows, limiting both credibility and the possibility of independent verification. At the same time, he believes that horizontal digital competencies—such as version control, collaborative documentation, markdown, and structured project management—will become essential professional practices. These are not advanced technical skills but foundational working methods that enable teams to produce transparent, reproducible, and collaborative investigations.

Regarding skills gaps, the interviewee highlights two complementary challenges. The first concerns the uneven adoption of artificial intelligence, with younger professionals generally adapting more rapidly than older generations. The second, and more significant, is the widespread lack of horizontal digital literacy. Many professionals have never been trained in collaborative documentation, workflow management, versioning, or systematic project organisation. According to the interviewee, these competencies should become part of the standard education of future journalists, since they underpin effective teamwork, reproducibility, and the responsible use of digital technologies in modern data journalism.

Ranking of the competency areas

- Data Journalism & Investigation
- Data & Analytics
- Communication & Storytelling
- Business & Strategy
- Professional & Collaborative Skills
- AI & Emerging Technologies
- Visualization & Content Production
- Media, Ethics & Governance
- Digital Media & Tools

5.2.4 Interview 7 – Evodevo

Full Name: <Anonymized data>

Organization/Role: Senior Analyst Data Architecture, Data Analytics & AI – <Anonymized data>

Conclusions

The interviewee approaches the competency framework from a unique perspective, combining previous experience in data journalism with his current role in artificial intelligence and data engineering. While he generally agrees with the proposed competency groups, he believes that **AI & Emerging Technologies** should receive significantly greater emphasis, as artificial intelligence is rapidly transforming the way journalists analyse, interpret, and communicate data. Drawing on his own experience, he argues that many of the tools currently available dramatically reduce the technical barriers traditionally associated with programming, data analysis, and visualization, making data journalism more accessible to professionals coming from non-technical backgrounds.

The interviewee describes modern data journalism as the combination of two complementary dimensions. The first is the **humanistic component**, which includes communication, storytelling, ethics, and editorial judgement. The second is the **technical component**, involving data collection, programming, data engineering, and analytical methods. Neither dimension is sufficient on its own: effective data journalists must be capable of combining technical proficiency with the ability to communicate complex information clearly and responsibly. For this reason, he suggests merging **Digital Media & Tools** with **AI & Emerging Technologies**, and **Communication & Storytelling** with **Visualization & Content Production**, reflecting the increasingly integrated nature of contemporary journalistic workflows.

Looking ahead, the interviewee expects artificial intelligence to become an integral part of every stage of journalistic production rather than a specialised competency. AI should be viewed as an enabling technology that supports data exploration, coding, visualization, and content generation while allowing journalists to focus on higher-level analytical and editorial tasks. However, he emphasises that this evolution makes critical judgement and ethical responsibility even more important, since professionals must remain capable of evaluating, validating, and contextualising AI-generated outputs.

Regarding skills gaps, the interviewee observes that many aspiring journalists still perceive technical competencies as barriers rather than opportunities. Educational programmes should therefore reduce this divide by introducing AI-assisted analytical tools alongside traditional data literacy, enabling students from humanities backgrounds to progressively acquire technical confidence without losing the interpretative and communicative skills that remain central to journalism. According to the interviewee, the future of data journalism lies in hybrid professionals who are equally comfortable working with data, technology, and narrative.

Ranking of the competency areas

- Data Journalism & Investigation

- Data & Analytics
- AI & Emerging Technologies
- Communication & Storytelling
- Visualization & Content Production
- Media, Ethics & Governance
- Professional & Collaborative Skills
- Digital Media & Tools
- Business & Strategy

5.2.5 Interview 8 – Evodevo

Full Name: <Anonymized data>

Organization/Role: Management Consultant – <Anonymized data>

Conclusions

The interviewee evaluates the competency framework from the perspective of organisational consulting and project management, highlighting that the perceived importance of competencies depends strongly on the professional background of respondents. She argues that survey results should always be interpreted in relation to the composition of the sample, since priorities differ considerably between journalists, consultants, researchers, and students. Consequently, she recommends presenting competency assessments together with respondent profiles and providing clearer descriptions of the scope of each competency area to facilitate interpretation by non-specialists.

Although she considers the proposed competency groups to be comprehensive and well structured, the interviewee assigns greater importance to **Professional & Collaborative Skills** than reflected in the survey results. From her perspective, successful data communication increasingly depends on project management, teamwork, stakeholder coordination, and the ability to operate effectively within multidisciplinary environments. Technical expertise remains essential, but it must be complemented by organisational capabilities that enable professionals to coordinate complex projects involving data specialists, communication experts, and decision-makers.

Looking towards the future, the interviewee identifies artificial intelligence and digital communication ecosystems as two of the main drivers of professional change. She expects journalists and communicators to work increasingly with AI-assisted workflows while simultaneously adapting their content to highly dynamic digital environments characterised

by social media, online communities, and interactive communication channels. In this context, flexibility, adaptability, and continuous learning become critical professional attributes.

Regarding current skills gaps, the interviewee emphasises that technical competencies alone are insufficient. Future professionals must also develop project management capabilities, communication skills, interdisciplinary collaboration, and the ability to understand organisational contexts in which data are produced, interpreted, and communicated. She concludes that educational programmes should adopt a multidisciplinary perspective, integrating technical, managerial, and communication competencies rather than treating them as separate domains.

Ranking of the competency areas

- Professional & Collaborative Skills
- AI & Emerging Technologies
- Business & Strategy
- Media, Ethics & Governance
- Digital Media & Tools
- Data & Analytics
- Visualization & Content Production
- Communication & Storytelling
- Data Journalism & Investigation

5.2.6 Interview 9 – Evodevo

Full Name: <Anonymized data>

Organization/Role: Digital Humanist – <Anonymized data>

Conclusions

The interviewee approaches the competency framework from the perspective of digital humanities, semantic technologies, and public-sector data management. Overall, she considers the proposed competency groups comprehensive and appropriately structured, suggesting only minor adjustments to their relative importance rather than structural modifications. In particular, she argues that **AI & Emerging Technologies** should receive greater prominence, since artificial intelligence increasingly contributes to the creation, organisation, interpretation, and communication of data across both public and private sectors. Professionals must therefore understand how AI systems generate information and be able to critically evaluate their outputs.

The interviewee confirms **Data & Analytics** and **Data Journalism & Investigation** as the methodological foundations of data communication, while emphasising the continuing importance of visualization as a bridge between technical information and public understanding. In her view, visualization is not merely a graphical exercise but a cognitive process that enables non-specialist audiences to interpret complex datasets. She also considers **Professional & Collaborative Skills** more important than reflected in the survey, recognising that large-scale data projects increasingly require cooperation between experts from different disciplines.

Looking ahead, the interviewee expects AI to become deeply integrated into professional workflows, particularly in areas involving metadata management, semantic enrichment, knowledge graphs, and large-scale digital collections. However, she stresses that AI-generated information cannot be accepted uncritically. Future professionals must combine technical understanding with critical reasoning, ensuring that automated processes remain transparent, interpretable, and ethically responsible. This is particularly important when dealing with cultural heritage and public information, where data quality and contextual accuracy are essential.

Regarding skills gaps, the interviewee identifies a persistent imbalance between rapidly evolving technical tools and professionals' ability to interpret and contextualise their outputs. Future education should therefore strengthen AI literacy, critical thinking, interdisciplinary collaboration, and semantic understanding of data, preparing professionals capable not only of using digital technologies but also of governing them responsibly within increasingly complex information ecosystems.

Ranking of the competency areas

- Data & Analytics
- Data Journalism & Investigation
- AI & Emerging Technologies
- Digital Media & Tools
- Professional &Collaborative Skills
- Media, Ethics & Governance
- Communication & Storytelling
- Visualization & Content Production
- Business & Strategy

5.2.7 Interview 10 – OGL

Full Name: <Anonymized data>

Organization/Role: Senior Editor and Investigative Reporter – <Anonymized data>

Conclusions

The interviewee broadly agrees with the proposed competency framework but stresses the importance of clearly distinguishing **data journalism** from **investigative journalism**. While acknowledging that the two fields increasingly overlap, he argues that they represent different professional practices. Data journalism primarily focuses on collecting, cleaning, analysing, and visualising datasets, whereas investigative journalism is rooted in source development, field reporting, documentary research, and long-term expertise in specific domains. Data analysis is therefore an important investigative tool, but it cannot replace traditional journalistic methods.

According to the interviewee, future competency frameworks should place greater emphasis on **domain expertise** and **contextual knowledge**, recognising that meaningful investigations emerge from a deep understanding of the sectors being covered. Particularly in areas such as organised crime, corruption, defence, or security, successful investigations depend on years of experience, trusted sources, and the ability to interpret documents within their broader political and institutional context. He therefore recommends treating data analysis as one component of a wider investigative process rather than equating it with investigative journalism itself.

Looking ahead, the interviewee expects data journalism to become increasingly collaborative and technically sophisticated. Artificial intelligence, advanced database management, and computational methods will enable journalists to connect heterogeneous datasets and identify patterns that would otherwise remain hidden. However, these technological advances will reinforce the need for multidisciplinary teams in which technical specialists, investigative reporters, and subject-matter experts contribute complementary expertise. At the same time, stronger quantitative literacy, particularly in statistics and economics, will become increasingly important for interpreting complex datasets responsibly.

Regarding current skills gaps, the interviewee observes that many early-career journalists focus on learning individual digital tools without developing a coherent investigative methodology. He identifies a lack of competencies related to organising, documenting, standardising, and sharing datasets for collaborative investigations. According to the interviewee, one of the most valuable emerging professional roles is that of the journalist capable of preparing structured, searchable, and reusable data environments that allow entire investigative teams to work efficiently across borders. Future education should therefore combine investigative methods, technical competencies, data management, and collaborative working practices.

Ranking of the competency areas

- Data Journalism & Investigation
- Data & Analytics
- Communication & Storytelling
- Visualization & Content Production
- Professional & Collaborative Skills
- Digital Media & Tools
- AI & Emerging Technologies
- Media, Ethics & Governance
- Business & Strategy

5.2.8 Interview 11 – OGL

Full Name: <Anonymized data>

Organization/Role: Freelance Data and AI Journalist – <Anonymized data>

Conclusions

The interviewee considers the proposed competency framework comprehensive and well balanced, emphasising that successful data journalists require a broad combination of complementary competencies rather than deep specialisation in a single area. He describes the profession as requiring "the first chapters of many different books": journalism, statistics, programming, data analysis, visualisation, ethics, and digital technologies. In his view, professionals do not need to become experts in every discipline, but they must possess sufficient knowledge to understand the potential and limitations of each field and collaborate effectively with specialists.

Among the proposed competencies, the interviewee assigns particular importance to **Data Journalism & Investigation**, **Visualization & Content Production**, and **Data & Analytics**, while also stressing that ethics remains a fundamental component of professional practice. Working with granular datasets often involves privacy risks and sensitive information, making anonymisation, statistical disclosure control, and responsible data handling essential competencies rather than secondary considerations. He also highlights **lateral thinking** as a key professional attribute, arguing that the most valuable journalistic insights often emerge from combining different datasets and identifying unexpected relationships between seemingly unrelated sources.

Looking towards the future, the interviewee identifies artificial intelligence as the principal driver of change within data journalism. AI increasingly enables journalists to write code, automate repetitive workflows, extract information from complex sources, and generate preliminary analyses, allowing even small newsrooms to undertake sophisticated data-driven projects. Nevertheless, he argues that these opportunities make **verification** more important than ever. Journalists must be able to validate AI-generated code, trace outputs back to original sources, and critically assess automated analyses before incorporating them into editorial work. Automation should therefore enhance journalistic practice rather than replace editorial judgement.

Regarding current skills gaps, the interviewee identifies a widespread lack of quantitative confidence among journalists. Many professionals remain uncomfortable with statistics, spreadsheets, and numerical reasoning, often perceiving technology as an obstacle rather than as a tool supporting investigative work. He argues that journalism education should foster stronger numerical literacy, computational thinking, and AI awareness while encouraging journalists to design efficient digital workflows instead of relying on isolated tools. In his view, the greatest challenge is not technological complexity itself, but developing the confidence and curiosity needed to integrate quantitative methods into everyday journalistic practice.

Ranking of the competency areas

- Data Journalism & Investigation
- Visualization & Content Production
- Data & Analytics
- AI & Emerging Technologies
- Digital Media & Tools
- Media, Ethics & Governance
- Business & Strategy
- Professional & Collaborative Skills
- Communication & Storytelling

5.2.9 Interview 12 – UNITOV

Full Name: <Anonymized data>

Organization/Role: Senior Reporter – <Anonymized data>

Conclusions

The interviewee broadly agrees with the proposed competency framework and considers it comprehensive, while emphasising that journalism is increasingly evolving towards a data-informed profession. Although her primary experience is in television reporting rather than specialised data journalism, she believes that the ability to identify, verify, interpret, and communicate reliable data is becoming an essential competency for all journalists. Data should not simply be collected but critically assessed, contextualised, and transformed into meaningful information that supports accurate reporting.

Particular importance is assigned to **Media, Ethics & Governance**, which the interviewee considers the cornerstone of professional journalism. In an information ecosystem increasingly influenced by artificial intelligence, digital manipulation, and misinformation, journalists have a fundamental responsibility to verify sources, preserve public trust, and ensure the accuracy of published information. Communication and storytelling remain equally essential, since complex evidence and datasets have little value unless they can be translated into clear, accessible narratives that reach a broad audience. The interviewee also highlights the growing relevance of AI literacy, arguing that journalists must understand both the opportunities and the risks associated with AI-generated content, including deepfakes and automated misinformation.

Looking towards the future, the interviewee expects journalism to become progressively more multidisciplinary. Data analysis, artificial intelligence, digital technologies, and traditional reporting will increasingly coexist within newsroom workflows, requiring closer collaboration between journalists, data specialists, communication professionals, and technology experts. Nevertheless, she emphasises that technological innovation should strengthen rather than replace traditional journalistic values, with ethical responsibility remaining the guiding principle of professional practice.

Regarding current skills gaps, the interviewee highlights the growing need for professionals capable of critically evaluating information, verifying data sources, and recognising AI-generated manipulation. Future education should therefore strengthen ethical awareness, AI literacy, data interpretation, and collaborative competencies, preparing journalists who are able to combine technological innovation with the editorial responsibility required to maintain public confidence in journalism.

Ranking of the competency areas

- Media, Ethics & Governance
- Professional & Collaborative Skills
- Communication & Storytelling
- Data Journalism & Investigation

- Data & Analytics
- Visualization & Content Production
- Digital Media & Tools
- AI & Emerging Technologies
- Business & Strategy

5.2.10 Interview 13 – UNITOV

Full Name: <Anonymized data>

Organization/Role: Founder and Editor-in-Chief – <Anonymized data>

Conclusions

The interviewee generally agrees with the proposed competency framework but argues that contemporary journalism should place greater emphasis on the ability to interpret and contextualise data rather than simply presenting quantitative information. Drawing on his experience in analysing television audiences and media trends, he explains that data only acquire journalistic value when combined with editorial judgement, domain expertise, and an understanding of their broader social, political, and economic implications. Data should therefore support journalism rather than become an end in themselves.

The interviewee highlights **Data & Analytics**, **Communication & Storytelling**, and **Media, Ethics & Governance** as the competencies that will become increasingly important in the coming years. He argues that journalists must develop stronger analytical abilities while maintaining their capacity to explain complex information clearly and responsibly. Particular attention should also be devoted to data ethics, privacy protection, and cybersecurity awareness, since journalists increasingly work with sensitive digital information and personal data whose misuse may have significant social consequences. Rather than proposing structural changes to the competency framework, he recommends strengthening the integration between analytical skills, communication, and ethical responsibility to better reflect the realities of modern journalism.

Looking ahead, the interviewee expects journalism to become progressively more data-driven without losing its interpretative function. The growing availability of quantitative information offers new opportunities for evidence-based reporting, but journalists will need stronger analytical competencies to distinguish between raw information and meaningful evidence. The challenge will not simply be collecting data but transforming them into coherent narratives that help readers understand complex social phenomena while respecting privacy and ethical standards.

Regarding current skills gaps, the interviewee identifies the need for stronger analytical competencies combined with ethical awareness and digital literacy. Future journalists should develop the ability to critically interpret data, understand the implications of cybersecurity and privacy, and communicate evidence-based information in an accessible way. According to the interviewee, the profession will increasingly require a balanced combination of analytical reasoning, communication skills, and responsible data management.

Ranking of the competency areas

The interviewee did not provide a complete numerical ranking. However, the competencies most consistently emphasised throughout the interview were:

- Data & Analytics
- Communication & Storytelling
- Media, Ethics & Governance
- Digital Media & Tools
- AI & Emerging Technologies

The remaining competency areas were not explicitly prioritised.

5.2.11 Interview 14 – UNITOV

Full Name: <Anonymized data>

Organization/Role: Journalist – <Anonymized data>

Conclusions

The interviewee partially agrees with the proposed competency framework, arguing that the relative importance of competencies varies considerably depending on the journalistic domain. While recognising the growing relevance of data analysis, he believes that journalism should never be reduced to the presentation of quantitative information. Instead, data should be interpreted, contextualised, and connected to broader cultural, historical, and social phenomena. According to the interviewee, the true value of journalism lies in helping readers understand the meaning behind facts rather than simply reporting them.

A central theme throughout the interview is the importance of a strong humanistic and cultural background. The interviewee argues that journalists should cultivate continuous learning throughout their careers, developing broad knowledge across literature, politics, economics, cinema, society, and culture. This interdisciplinary perspective enables professionals to establish meaningful connections between apparently unrelated events and

to construct well-founded arguments that go beyond factual reporting. Communication and storytelling therefore remain the defining competencies of journalism, while data analysis should serve as a supporting tool rather than replacing editorial interpretation.

Looking towards the future, the interviewee expects artificial intelligence to automate an increasing proportion of routine news production, particularly short, standardised news reports. However, he believes that this evolution will reinforce rather than diminish the importance of human journalists. The distinguishing value of professional journalism will increasingly lie in critical thinking, interpretation, and the ability to explain complex issues through original perspectives and culturally informed analysis. AI should be understood as a useful support tool, but not as a substitute for the journalist's voice, experience, or capacity for judgement.

Regarding current skills gaps, the interviewee identifies the lack of independent thinking as one of the most significant weaknesses among young journalists. Students often rely heavily on existing information without developing their own analytical perspective or connecting knowledge across different disciplines. Future education should therefore strengthen critical thinking, interdisciplinary culture, interpretative reasoning, and lifelong learning, preparing journalists capable of moving beyond superficial reporting to produce thoughtful and socially meaningful journalism.

Ranking of the competency areas

- Communication & Storytelling
- Data Journalism & Investigation
- Data & Analytics
- Digital Media & Tools
- Professional & Collaborative Skills
- Business & Strategy
- Media, Ethics & Governance
- Visualization & Content Production
- AI & Emerging Technologies

6 Conclusions

he fourteen expert interviews conducted in Italy provide a comprehensive overview of the current evolution of data journalism and data communication across a wide range of professional contexts, including national and local news organisations, investigative journalism, digital-native media, public broadcasting, civic technology organisations, public

administration, consulting companies, and academia. Despite the diversity of backgrounds represented, several common themes emerged consistently throughout the interviews.

The first major finding is that **data journalism is no longer perceived as a niche specialisation**. Most interviewees agreed that data competencies are becoming an integral part of journalism itself. Regardless of whether professionals work in television, digital media, investigative reporting, or civic technology, they increasingly rely on quantitative information, open data, audience metrics, or digital evidence to support their reporting. However, respondents consistently stressed that **data alone do not generate meaningful journalism**. Their value depends on journalists' ability to critically interpret information, place it within its broader social, political, economic, and cultural context, and communicate it effectively to different audiences.

A second recurring finding concerns the **growing importance of critical thinking**. Almost every interview highlighted that future journalists will not be distinguished simply by their technical ability to process data, but by their capacity to ask meaningful questions, verify sources, recognise methodological limitations, detect biases, and construct evidence-based narratives. Several experts also underlined the importance of broad cultural and interdisciplinary knowledge, arguing that journalism requires the ability to connect information across politics, economics, science, culture, technology, and society rather than treating these domains as isolated disciplines.

Artificial Intelligence emerged as one of the most significant drivers of professional transformation. Interviewees generally agreed that AI will become increasingly embedded within journalistic workflows, supporting data collection, coding, information extraction, visualisation, and content production. Nevertheless, there was a strong consensus that AI should be regarded as an **enabling technology rather than a replacement for journalistic judgement**. Journalists will therefore require not only AI literacy but also the ability to critically evaluate automated outputs, recognise hallucinations and misinformation, verify AI-generated content, and preserve editorial independence. Several participants explicitly warned against excessive dependence on AI, emphasising that human interpretation, creativity, and ethical responsibility remain irreplaceable.

Another theme repeatedly emerging across interviews is the **central role of ethics**. Ethical responsibility was considered fundamental regardless of the professional background of the interviewees. Beyond traditional journalistic principles such as accuracy and source verification, respondents highlighted new ethical challenges related to privacy protection, cybersecurity, responsible use of artificial intelligence, transparency of analytical methods, and the communication of uncertainty. As journalism becomes increasingly data-driven, ethical competencies must evolve accordingly to ensure public trust in an environment characterised by information overload and digital manipulation.

The interviews also reveal that the profession is becoming increasingly **interdisciplinary and collaborative**. Contemporary data journalism requires cooperation between journalists, data analysts, software developers, designers, communication specialists, and subject-matter experts. Several interviewees stressed that future professionals should acquire not only technical competencies but also collaborative working methods, project management capabilities, and reproducible analytical workflows capable of supporting multidisciplinary teams.

Regarding skills gaps, respondents identified a number of recurring weaknesses among recent graduates and early-career professionals. These include limited statistical literacy, insufficient familiarity with data analysis tools, weak verification practices, and inadequate understanding of artificial intelligence. However, the most frequently mentioned deficiencies were **non-technical**. Many interviewees observed a lack of critical thinking, independent judgement, interpretative ability, and interdisciplinary culture. Several experts argued that young journalists often possess digital skills but struggle to transform information into meaningful explanations or to develop an original analytical perspective.

Overall, the Italian interviews suggest that future education in data journalism should move beyond a purely technical approach. While competencies in data analysis, visualisation, programming, and AI remain essential, they should be integrated with communication, investigative methods, ethical awareness, critical reasoning, and humanistic education. The emerging professional profile is therefore not that of a data technician, but of a journalist capable of combining quantitative evidence with analytical thinking, contextual understanding, and effective public communication.

Ultimately, the Italian national context portrays data journalism as a rapidly evolving field where technology enhances—but does not replace—the fundamental mission of journalism: helping citizens understand an increasingly complex reality through accurate, transparent, and evidence-based information.


DAPHNE

DAPHNE

National Report Portugal

Universidade Nova de Lisboa – Nova Information Management School

WP2

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1 Executive summary

This National Report, developed as part of Work Package 2 (WP2) of the DAPHnE project, presents the findings from the activities conducted under Task 2.2 (T2.2), utilising the methodological tools designed in Task 2.1 (T2.1). The primary objective of this document is to analyse data at the national level and provide a comprehensive overview of the current landscape and industry needs regarding key competencies. Specifically, this document outlines the results of the activities conducted under Task 2.2 (T2.2), applying the analytical tools as desk research, survey, and interviews developed in Task 2.1 (T2.1) to the national context.

The foundation for this analysis stems from a preceding phase, which reviewed international training programs and best practices to identify the core competencies required in the sector. This initial extraction resulted in the categorisation of nine critical occupational and skill groups: Data & Analytics, Data Journalism & Investigation, Communication & Storytelling, Visualisation & Content Production, Digital Media & Tools, AI & Emerging Technologies, Media, Ethics & Governance, Business & Strategy, and Professional & Collaborative Skills.

Building upon this framework, a national survey was deployed to assess the perceived importance and relevance of these nine specific skill groups among stakeholders. This report details the insights derived from this survey data, mapping out the national priorities and skill gaps.

Furthermore, the report sets the stage for the next phase of the project, where these initial survey results and the identified skill groups will be rigorously validated and further complemented through targeted interviews with industry experts. Ultimately, this national analysis will contribute to establishing a clear, evidence-based framework for the professional profile and competencies required in the field.

2 Introduction

This National Report is developed as a key component of Work Package 2 (WP2) within the DAPHnE project, specifically addressing the objectives outlined in Task 2.2. The primary aim of this document is to provide a comprehensive, evidence-based analysis of the current landscape, skill requirements, and industry needs regarding key competencies in data journalism and communication at the national level.

To achieve this, the report synthesizes findings from a multi-stage methodological approach, utilizing the analytical tools and frameworks developed during Task 2.1. In order to provide a holistic and structured view of the national context, this report is organized into the following three main sections:

- **Section 1: Desk Research and Best Practices.** The first section explores the initial findings derived from a comprehensive desk research phase. It analyzes the good practices identified at the national level.
- **Section 2: National Survey Results.** The second section presents a detailed analysis of the quantitative data gathered through a targeted Daphne survey. This survey was distributed to the relevant stakeholders and professionals to assess the perceived importance, current demand, and relevance of the predefined skill groups results obtained from the Desk Research phase.
- **Section 3: Expert Interviews.** The final section details the qualitative insights obtained from in-depth interviews conducted with national industry experts. These interviews serve to validate, complement, and provide deeper context to the survey results, ensuring that the identified competencies accurately reflect the realities of the professional landscape.

By integrating these three dimensions—existing best practices, broad stakeholder perceptions, and expert validation—this report aims to establish a clear and robust framework for the professional profiles required in the sector, ultimately guiding the subsequent educational and vocational training developments of the DAPHnE project.

3 Best practices analysis

The selected best practices represent complementary dimensions of the Portuguese data journalism ecosystem, encompassing investigative journalism initiatives, open data infrastructures, statistical repositories, methodological guidance, and media organisations applying data-driven storytelling.

3.1 Best Practice 1

Description: Independent journalism platform producing in-depth investigations supported by data analysis, interviews, and contextual evidence. Strong focus on data-informed storytelling.

Link to the website: https://fumaca.pt/

Why is relevant: The *Fumaça* initiative is relevant to a DAPHNE project because it demonstrates how independent, evidence-based journalism can strengthen public awareness, expose systemic violence, and improve media literacy through rigorous data-driven storytelling. Since 2016, *Fumaça* has produced in-depth investigative podcasts and reports that combine data analysis, interviews, fact-checking, and long-form narrative to scrutinize social inequalities, human rights issues, institutional failures, and vulnerable populations. This good practice illustrates how investigative data journalism can be used as a powerful tool to prevent violence through awareness, strengthen media literacy, amplify the voices of vulnerable communities, and promote evidence-based public discourse

3.2 Best Practice 2

Description: Public statistical database providing reliable and accessible data about Portugal and Europe. Widely used by journalists, researchers and policymakers to support evidence-based communication.

Link to the website: https://www.pordata.pt/

Why is relevant: PORDATA is relevant to the DAPHNE project because it provides reliable, official, and openly accessible statistical data that can be used to support evidence-based research, awareness campaigns, and policy recommendations. Its integration of data from trusted sources such as the Portuguese National Institute of Statistics (INE) and Eurostat enables project partners to identify social trends, compare national and European indicators, and substantiate communication with credible evidence. Furthermore, PORDATA promotes data literacy by making complex statistical information understandable and accessible to researchers, journalists, educators, policymakers, and the general public. This supports DAPHNE's objectives of improving informed decision-making, strengthening public

awareness, and fostering critical understanding of social issues through the effective use of trustworthy data.

3.3 Best Practice 3

Description: National open data portal providing access to datasets from public administration, supporting transparency, reuse of data, and data-driven communication practices.

Link to the website: https://dados.gov.pt/pt/

Why is relevant: The Portuguese Open Data Portal is relevant because it provides free access to official public-sector datasets that can be used to support evidence-based research, communication, and policy development. By enabling the reuse of government data, it facilitates the production of reliable analyses, visualisations, and educational materials grounded in verified information. The portal also promotes transparency, accountability, and data literacy, encouraging stakeholders to use public data to better understand social challenges and inform decision-making. For the DAPHNE project, this supports the development of data-driven communication strategies, strengthens the quality of awareness-raising activities, and enables partners to produce evidence-based resources and recommendations for preventing violence and protecting vulnerable groups.

3.4 Best Practice 4

Description: The "Manual de Boas Práticas em Jornalismo de Dados" provides a structured framework of ethical, methodological, and technical guidelines for data journalism. It addresses key aspects such as data collection, verification, analysis, visualisation, and responsible communication, including privacy and ethical considerations. The manual supports the development of reliable, transparent, and evidence-based journalistic practices.

Link to the website: https://iconline.ipleiria.pt/entities/publication/f9bc0388-46d4-48a2-b5e5-d74b0032a45d

Why is relevant: This good practice is relevant because it provides a **comprehensive framework for the ethical and responsible use of data in communication**. Its guidance on data collection, verification, analysis, visualisation, and privacy supports the production of accurate, transparent, and evidence-based information on sensitive topics such as violence against women, children, and other vulnerable groups. The manual also promotes **ethical storytelling and responsible data communication**, helping professionals avoid misrepresentation, protect personal data, and present complex information in an accessible and trustworthy way. These principles align with DAPHNE's objectives of improving data literacy, strengthening evidence-based awareness campaigns, combating misinformation, and fostering responsible communication that respects the rights and dignity of victims and vulnerable populations.

3.5 Best Practice 5

Description: National newspaper with regular use of data visualisation and statistical analysis in news reporting, especially in political and economic coverage.

Link to the website: https://expresso.pt/dados

Why is relevant: The *Expresso Dados* initiative is relevant to the DAPHNE project because it demonstrates how data visualisation and evidence-based journalism can make complex social issues more accessible and understandable to the public. By combining official statistics, data analysis, and clear visual storytelling, it helps readers interpret evidence accurately and supports informed public debate. Its approach illustrates how data-driven communication can strengthen public awareness, combat misinformation, and present sensitive topics responsibly, making it a valuable example for DAPHNE communication activities. The use of interactive visualisations and statistical analysis can inspire the development of educational materials and awareness campaigns that effectively communicate evidence on violence, discrimination, and other social issues while promoting critical thinking and data literacy. Overall, it shows how high-quality data journalism can transform reliable data into accessible, engaging, and trustworthy communication, aligned with DAPHNE's objectives of fostering evidence-based awareness, improving data literacy, and encouraging informed civic engagement.

4 National Survey Results

This section presents the analysis of the quantitative data collected through the official DAPHnE project survey (available via EUSurvey: Daphne-EUProject). For the Spanish national context, a sample of 34 responses was gathered from professionals, educators, and industry stakeholders. The results analyzed in the following subsections focus on the responses to the key questions of this questionnaire, which were specifically designed to assess the perceived importance and current demand for the nine occupational competency groups identified during the research phase (such as *Data & Analytics*, *Data Journalism & Investigation*, *Visualization & Content Production*, among others). This quantitative analysis provides a data-driven overview of the training priorities and the specific needs of the Spanish labor market in the field of data journalism.

Checking the sample in Figure 1, we can observe the representation between the active media industry and the educational sector. Although, this sample of respondent does not include Media organisations/Newsrooms, it still ensures a comprehensive overview of both current labor market demands and academic training realities.

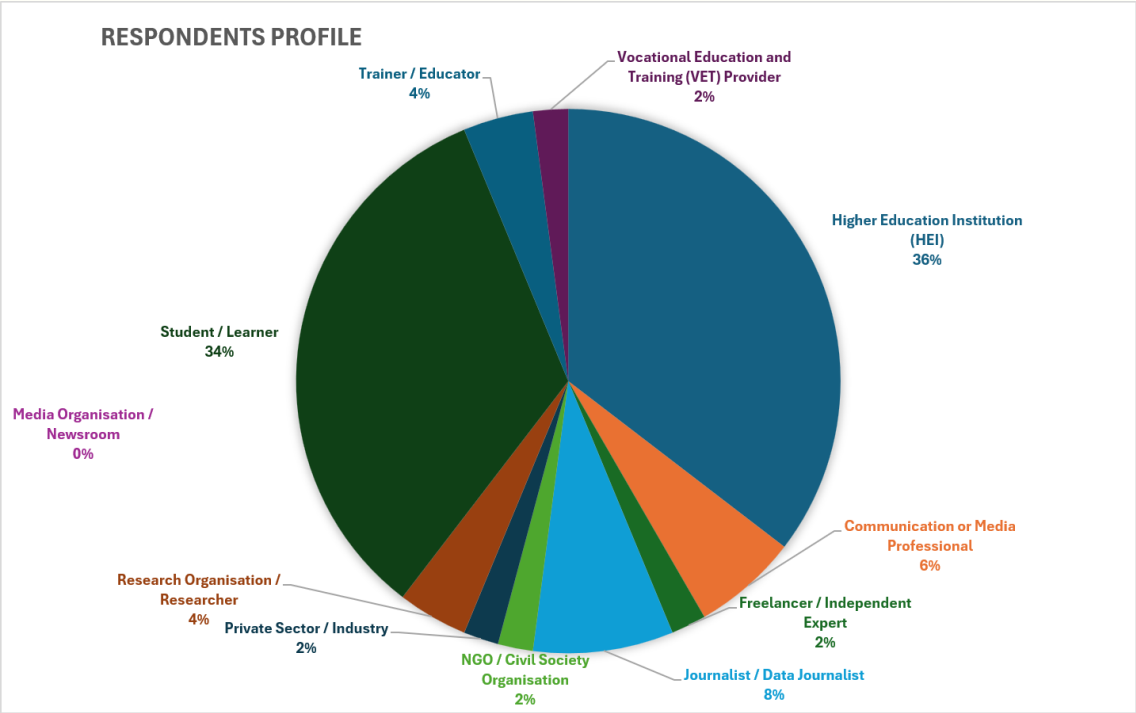


Figure 1. Respondents profile

Regarding the respondents familiarity with the concept of Data Journalism and Data Communication personal perception, most of them answered that they are medium familiar or well familiar, representing 49% of total responses, as can be observed in Figure 2.

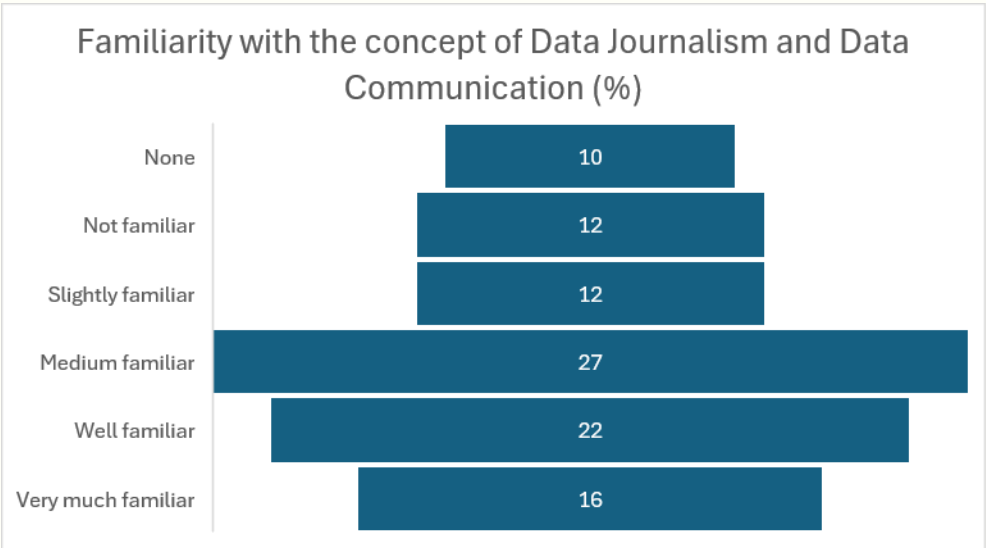


Figure 2. Familiarity with the concept

Regarding the analysis of the importance of the different skills groups, there were two different complimentary questions in the survey. Analysing the responses we can extract:

- **Top-Tier Priorities**: Data Journalism & Investigation ranks as the absolute highest priority, achieving an average score of 4.45. It is closely followed by Data & Analytics, with 4.31, Media, Ethics & Governance and Communication & Storytelling both with 4.27. These figures indicate that a data journalist most important skills are investigative capacity, data analytics, communication and ethics in Portugal.
- **Core Baseline Skills**: A solid middle tier consists of competencies that all scored above 4.0, marking them as important standard requirements. This includes Visualization & Content Production (4.15) and Digital Media & Tools (4.12).
- **Secondary Priorities**: While still valued as important (scoring above 3.0), Professional & Collaborative Skills (3.96), AI & Emerging Technologies (3.84) and Business & Strategy (3.35) recorded the lowest average scores. Respondents in Portugal currently view artificial intelligence and business modelling as secondary or specialized priorities compared to immediate journalistic and data-processing foundations. Also, Professional & Collaborative Skills, like critical thinking, for example, have a high score, just slightly bellow 4.0, being somewhat between in the middle tier and the bottom one. Meaning that maybe this skills can be considered for the core baseline skills.

These results can be observed in the Figure 3.

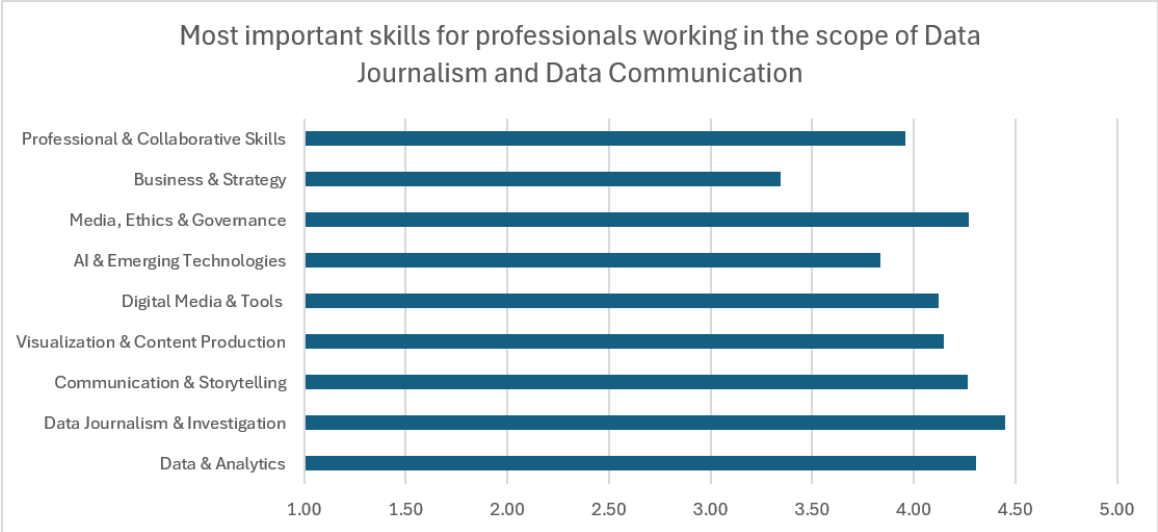


Figure 3. Importance of the skills groups for the professionals

To complement the quantitative analysis, the survey included an optional open-ended question inviting participants to share additional perspectives or identify knowledge groups they felt were missing from the initial proposal. The qualitative responses obtained were highly enriching and reveal several key areas that professionals consider indispensable for the current practice of data journalism.

The main findings extracted from this section are grouped into the following themes:

- Respondents said that "Science communication; AI literacy related to the correct usage of AI tools like NotebookLM for example, and others, not exactly skills related

to machine learning and other technologies, also the risks of AI." Giving and emphasis on AI and its dangers.

- Statistical literacy was also one of the responses. In order for journalists avoid a distortion of the data and in the way it is presented to the public.
- Competencies in creating inclusive content, for different audiences, with different cognitive capabilities, limited IT knowledge and different levels of literacy. Respondents give emphasis on communication on different level here..
- Another response relates to GDPR and source protection. Knowing the legal part of using data is beneficial to data journalists.
- One key knowledge and skill mentioned was “Geospatial and Mapping Skills (Basic GIS skills; Working with open geospatial datasets; Data visualization principles for geographic data; Identifying geographic patterns, disparities, and trends; Critical interpretation of maps and spatial bias; Ethical handling of sensitive location data)” – This respondent perceives that GIS and using geospatial data is extremely important for a data journalist.

5 Expert Interviews

Following the initial desk research and the quantitative analysis of the national survey, a series of targeted interviews with national industry experts were conducted. The primary and most critical purpose of these interviews is to rigorously validate the occupational and competency groups identified in the previous phases. While these in-depth consultations also serve to complement the existing data—providing deeper qualitative context, expanding on specific nuances, and exploring the actual panorama—their fundamental objective remains validation of previous findings.

For Portugal, **8 interviews** were conducted by the 3 Portuguese partners, IPG, INOVA+ and UNL-NovaIMS. The most relevant information extracted from the interviews is as indicated in the next subsections.

5.1 Interview 1 – UNL-NovaIMS

Full Name: <Anonymized data>

Organization/Role: <Anonymized data>/Editorial Director

Conclusions: The interview highlights that data journalism has evolved from a niche specialization into a core journalistic competence that should be integrated across all areas of journalism. While technical skills remain important, the interviewee places greater emphasis on editorial judgment, communication, strategic thinking, and ethical responsibility. Looking ahead, the most critical competencies will be critical data literacy, the responsible use of AI

and computational tools, and the ability to communicate complex information through clear and engaging narratives. The interview also identifies a significant gap between technical proficiency and journalistic thinking among new graduates. To address this, higher education institutions should adopt a more practical and interdisciplinary approach by embedding data literacy throughout journalism curricula, promoting project-based learning with real datasets, fostering collaboration between academia and news organisations, and integrating AI education with a strong focus on transparency, ethics, and editorial integrity.

We also asked the interviewee to rank the skills found during the desk research phase:

__9_ Data & Analytics

__4_ Data Journalism & Investigation

__2_ Communication & Storytelling

__6_ Visualization & Content Production

__5_ Digital Media & Tools

__8_ AI & Emerging Technologies

__3_ Media, Ethics & Governance

__1_ Business & Strategy

__7_ Professional & Collaborative Skills

5.2 Interview 2 – UNL-NovaIMS

Full Name: <Anonymized data>

Organization/Role: <Anonymized data> / Communication Director

Conclusions: The interviewee views the proposed competency framework as overly broad and argues that several categories mix core competencies, specific skills, and general principles. They distinguish data journalism as an overarching discipline from narrower skills such as fact-checking and research, while emphasising that concepts such as freedom of information, media ethics, critical thinking, and communication are fundamental to all forms of journalism rather than unique to data journalism. They also stress that data analysis, collection, processing, and interpretation are the core competencies of data journalism, whereas storytelling, writing, and visualisation should be understood as transferable journalistic skills. Although AI is seen as increasingly important, it is regarded as a transversal technology relevant across the entire profession.

Looking ahead, the interviewee expects artificial intelligence to become an integral part of data processing, analysis, investigation, information retrieval, and content production, despite

concerns about reliability and the need for human oversight. She emphasised that data should guide journalists toward stories and questions but should never replace traditional reporting practices. Data alone cannot provide the full picture; findings must always be verified through sources, interviews, and contextual investigation. Consequently, journalism education should prepare professionals not only to analyse diverse forms of data but also to integrate these technical capabilities with fundamental journalistic principles such as verification, source validation, and critical inquiry.

We also asked the interviewee to rank the skills found during the desk research phase:

__9_ Data & Analytics

__5_ Data Journalism & Investigation

__3_ Communication & Storytelling

__2_ Visualization & Content Production

__4_ Digital Media & Tools

__7_ AI & Emerging Technologies

__8_ Media, Ethics & Governance

__1_ Business & Strategy

__6_ Professional & Collaborative Skills

5.3 Interview 3 - INOVA+

Full Name: <Anonymized data>

Organization/Role: <Anonymized data>/Head of the Communications Department

Conclusions: The interviewee broadly agrees with the proposed competency framework but argues that communication, storytelling, ethics, and professional skills deserve greater emphasis alongside data analysis and investigative journalism. They recommend expanding the framework to include strategic communication, generative AI literacy, algorithm auditing, science communication, stakeholder management, inclusive communication, digital security, and impact assessment. They also suggest merging some technology-related categories and renaming the business dimension to better reflect editorial strategy, product development, and sustainability. Overall, they view data journalism as an increasingly interdisciplinary field requiring analytical, technological, and communication competencies rather than expertise in isolated technical tools.

Looking ahead, the interviewee expects generative AI, automated data analysis, greater transparency in AI use, and the emergence of hybrid professional profiles to shape the profession. They identify Communication and Storytelling, Data and Analysis, and AI and Emerging Technologies as the three most important competency areas for the coming years. The main skills gaps concern the ability to work with real-world data, communicate findings

to diverse audiences, and collaborate across disciplines, reflecting a mismatch between organisations' demand for hybrid professionals and education systems that continue to separate communication, technology, and data analysis. They conclude that future training should prioritise transferable competencies, including critical thinking, ethics, data literacy, AI, project management, and continuous learning, over proficiency in rapidly changing tools..

We also asked the interviewee to rank the skills found during the desk research phase:

__2_ Data & Analytics

__3_ Data Journalism & Investigation

__1_ Communication & Storytelling

__6_ Visualization & Content Production

__8_ Digital Media & Tools

__5_ AI & Emerging Technologies

__4_ Media, Ethics & Governance

__9_ Business & Strategy

__7_ Professional & Collaborative Skills

5.4 Interview 4 - INOVA+

Full Name: <Anonymized data>

Organization/Role: <Anonymized data>/ Senior data visualization designer

Conclusions: The interviewee views the proposed competency framework as comprehensive and argues that, with the exception of business strategy, the different competency areas are deeply interconnected in practice. Based on experience in both data journalism and data visualisation, they emphasize that journalists in small and medium-sized newsrooms rarely specialise in a single area and instead need to combine data analysis, investigation, storytelling, ethics, technical skills, and collaboration within the same role. They identify Data and Analysis, Data Journalism and Investigation, Communication and Storytelling, and Media, Ethics and Governance as the foundational competencies that cannot be separated, while stressing that ethics must underpin every stage of the journalistic process. AI is recognised as increasingly important, particularly because of its implications for bias, transparency, and responsible data use.

Looking ahead, the interviewee believes that larger, well-funded news organisations will continue to invest in sophisticated data journalism, while smaller newsrooms may struggle due to limited resources, staffing, and remuneration for highly specialised professionals. They argue that the future of the profession will depend on strong investigative journalism, rigorous

data analysis, ethical decision-making, and the ability to produce compelling stories across multiple platforms. The main challenge for new professionals is not necessarily technical knowledge but curiosity, initiative, and the willingness to develop multidisciplinary skills. The interview concludes that journalism education should prepare students for the reality of hybrid roles, where they are often expected to manage the entire journalistic workflow—from identifying stories and analysing data to producing visualisations, coding, publishing, and promoting content—while also offering short training opportunities for generalist journalists who increasingly need to interpret and communicate data effectively.

We also asked the interviewee to rank the skills found during the desk research phase:

__1_ Data & Analytics

__1_ Data Journalism & Investigation

__1_ Communication & Storytelling

__2_ Visualization & Content Production

__2_ Digital Media & Tools

__3_ AI & Emerging Technologies

__1_ Media, Ethics & Governance

__4_ Business & Strategy

__2_ Professional & Collaborative Skills

5.5 Interview 5 - IPG

Full Name: <Anonymized data>

Organization/Role: <Anonymized data>/Invited Adjunct Professor

Conclusions: The interviewee broadly endorses the proposed competency framework, particularly the distinction between Data and Analysis and Data Journalism and Investigation, while arguing that artificial intelligence should no longer be considered an emerging competency but a fundamental capability for professionals working with data and communication. They identify AI and Emerging Technologies, Communication and Storytelling, and Media, Ethics and Governance as the competencies that will be most critical over the next five years. Looking ahead, they anticipate that AI will become fully embedded in professional workflows, ethics will evolve from a theoretical principle to an operational requirement, and the ability to communicate complex data effectively to non-specialist audiences will become increasingly important across fields such as health, environmental communication, and public policy.

The interview also highlights a significant mismatch between educational provision and labour market expectations. According to the interviewee, employers increasingly seek professionals who combine data analysis, storytelling, and AI literacy, while educational programmes continue to develop these competencies separately. The main skills gaps among higher education graduates include limited autonomy in collecting, analysing, and interpreting data, insufficient critical evaluation of AI-generated outputs, and difficulty translating complex information into accessible language. Among vocational education graduates, the primary weakness is the limited ability to understand the broader editorial and strategic context behind technical tasks. Overall, the interview underscores the need for interdisciplinary training that integrates AI, data literacy, ethics, critical thinking, and communication to better prepare graduates for evolving professional demands.

We also asked the interviewee to rank the skills found during the desk research phase:

__3_ Data & Analytics

__6_ Data Journalism & Investigation

__2_ Communication & Storytelling

__7_ Visualization & Content Production

__5_ Digital Media & Tools

__1_ AI & Emerging Technologies

__4_ Media, Ethics & Governance

__9_ Business & Strategy

__8_ Professional & Collaborative Skills

5.6 Interview 6 - IPG

Full Name: <Anonymized data>

Organization/Role: <Anonymized data>/ HE Lecturer

Conclusions: The interviewee broadly agrees with the proposed competency framework, suggesting only that data interpretation should be recognised as a distinct competency due to its central role in transforming data into meaningful insights. While ranking Business and Strategy as the highest priority, the interview consistently highlights the growing importance of artificial intelligence and data interpretation as the competencies most likely to shape the future of data journalism and data communication. The interviewee views AI as a key driver of change over the next three to five years and considers the ability to interpret data effectively to be essential for producing valuable journalistic and communication outcomes.

Regarding skills gaps, the interview identifies data interpretation as the most significant weakness among graduates entering the profession. According to the interviewee, although access to data is becoming easier, many new professionals struggle to extract meaningful insights and contextualise the information they analyse. Another common challenge is the ability to filter and select relevant data from increasingly large datasets. Overall, the interview suggests that future education and training should place greater emphasis not only on acquiring technical skills and AI literacy but also on developing stronger analytical and interpretative abilities that enable professionals to make informed decisions based on data.

We also asked the interviewee to rank the skills found during the desk research phase:

__9_ Data & Analytics

__4_ Data Journalism & Investigation

__3_ Communication & Storytelling

__2_ Visualization & Content Production

__6_ Digital Media & Tools

__5_ AI & Emerging Technologies

__7_ Media, Ethics & Governance

__1_ Business & Strategy

__8_ Professional & Collaborative Skills

5.7 Interview 7 - IPG

Full Name: <Anonymized data>

Organization/Role: <Anonymized data>/ Communication lecturer and manager

Conclusions: The interviewee considers the proposed competency framework to be generally appropriate, although they question the relevance of Business and Strategy within the context of data journalism and suggest that the concept of Professional and Collaborative Skills should be more clearly defined. They identify Data Journalism and Investigation, Data and Analysis, and Communication and Storytelling as the most important competencies, while also recognising that artificial intelligence and emerging technologies will play an increasingly significant role in the profession over the next five years. Overall, the interview underscores the importance of combining strong analytical capabilities with the ability to communicate data effectively.

Regarding skills gaps, the interviewee argues that the main deficiencies among both higher education and vocational education graduates are not primarily technical but relate to a lack of broad general knowledge. They emphasise that a strong foundation in disciplines such as

history, philosophy, law, geography, cultural studies, and other social sciences is essential for interpreting data, understanding context, and producing meaningful journalism. The interview therefore suggests that, alongside technical competencies and AI literacy, journalism education should continue to cultivate critical thinking and interdisciplinary knowledge to enable professionals to analyse and communicate complex issues effectively.

We also asked the interviewee to rank the skills found during the desk research phase:

__2_ Data & Analytics

__1_ Data Journalism & Investigation

__4_ Communication & Storytelling

__3_ Visualization & Content Production

__6_ Digital Media & Tools

__5_ AI & Emerging Technologies

__7_ Media, Ethics & Governance

__9_ Business & Strategy

__8_ Professional & Collaborative Skills

5.8 Interview 8 - IPG

Full Name: <Anonymized data>

Organization/Role: <Anonymized data>/ Adjunct Professor

Conclusions: The interviewee broadly agrees with the proposed competency framework, considering it a good reflection of the interdisciplinary nature of data journalism and data communication. However, they recommend strengthening the framework by explicitly incorporating competencies related to AI literacy, fact-checking and combating disinformation, ethical and legal data management, interdisciplinary collaboration, project management, adaptability to rapidly evolving digital environments, and communication impact assessment. They identify Data Journalism and Investigation, Data and Analysis, and Digital Media and Tools as the most important competency areas, while predicting that future professional success will increasingly depend on combining advanced data analysis with the ethical use of AI and the ability to communicate complex information through clear and engaging narratives.

The interview also highlights important differences in the skills gaps of graduates from higher education and vocational education. According to the interviewee, higher education graduates generally possess strong theoretical knowledge but often lack practical experience in collecting, cleaning, analysing, and visualising data, as well as applying AI and fact-checking

techniques in professional settings. In contrast, vocational education graduates tend to have stronger practical skills but require greater development in critical thinking, data interpretation, research methodologies, ethical data use, and communication for diverse audiences. Overall, the interview emphasises the need for education and training programmes that better integrate technical expertise with analytical thinking, ethical responsibility, digital literacy, and interdisciplinary collaboration to prepare professionals for the evolving demands of data journalism.

We also asked the interviewee to rank the skills found during the desk research phase:

__2_ Data & Analytics

__1_ Data Journalism & Investigation

__7_ Communication & Storytelling

__8_ Visualization & Content Production

__3_ Digital Media & Tools

__6_ AI & Emerging Technologies

__4_ Media, Ethics & Governance

__9_ Business & Strategy

__5_ Professional & Collaborative Skills

6 Conclusions

The findings of the Portuguese national report indicate that data journalism is increasingly regarded as a core competence for journalism rather than a specialised field. Across the desk research, survey, and expert interviews, respondents consistently identified Data Journalism & Investigation, Data & Analytics, Communication & Storytelling, and Media, Ethics & Governance as the most important competency areas. While technical skills and digital tools are essential, experts emphasised that critical thinking, editorial judgement, ethical responsibility, and the ability to communicate complex data clearly remain fundamental to the profession. Artificial intelligence is expected to become an integral part of journalistic workflows, but should support—not replace—human verification, critical analysis, and responsible decision-making.

The report also reveals a clear gap between current educational provision and labour market expectations. Experts highlighted that graduates often lack practical experience in collecting, analysing, interpreting, and visualising real-world data, as well as applying AI responsibly in professional contexts. They recommended a stronger emphasis on project-based and interdisciplinary learning, closer collaboration between higher education institutions and

industry, and the integration of data literacy, AI literacy, ethics, and communication skills throughout journalism curricula. Emerging competencies such as statistical literacy, geospatial data and mapping, inclusive communication, and legal aspects of data use were also identified as important areas for future training, reflecting the evolving demands of the data journalism profession.


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National Report (Greece)

Aristotle University of Thessaloniki

WP2

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1 Executive summary

This National Report, developed as part of Work Package 2 (WP2) of the DAPHnE project, presents the findings from the activities conducted under Task 2.2 (T2.2), utilizing the methodological tools designed in Task 2.1 (T2.1). The primary objective of this document is to analyze data at the national level and provide a comprehensive overview of the current landscape and industry needs regarding key competencies. Specifically, this document outlines the results of the activities conducted under Task 2.2 (T2.2), applying the analytical tools as desk research, survey, and interviews developed in Task 2.1 (T2.1) to the national context.

The foundation for this analysis stems from a preceding phase, which reviewed international training programs and best practices to identify the core competencies required in the sector. This initial extraction resulted in the categorization of nine critical occupational and skill groups: Data & Analytics, Data Journalism & Investigation, Communication & Storytelling, Visualization & Content Production, Digital Media & Tools, AI & Emerging Technologies, Media, Ethics & Governance, Business & Strategy, and Professional & Collaborative Skills.

Building upon this framework, a national survey was deployed to assess the perceived importance and relevance of these nine specific skill groups among stakeholders. This report details the insights derived from this survey data, mapping out the national priorities and skill gaps.

Furthermore, the report sets the stage for the next phase of the project, where these initial survey results and the identified skill groups will be rigorously validated and further complemented through targeted interviews with industry experts. Ultimately, this national analysis will contribute to establishing a clear, evidence-based framework for the professional profile and competencies required in the field.

2 Introduction

This National Report is developed as a key component of Work Package 2 (WP2) within the DAPHnE project, specifically addressing the objectives outlined in Task 2.2. The primary aim of this document is to provide a comprehensive, evidence-based analysis of the current landscape, skill requirements, and industry needs regarding key competencies in data journalism and communication at the national level.

To achieve this, the report synthesizes findings from a multi-stage methodological approach, utilizing the analytical tools and frameworks developed during Task 2.1. In order to provide a holistic and structured view of the national context, this report is organized into the following three main sections:

- **Section 1: Desk Research and Best Practices.** The first section explores the initial findings derived from a comprehensive desk research phase. It analyzes the good practices identified at the national level.
- **Section 2: National Survey Results.** The second section presents a detailed analysis of the quantitative data gathered through a targeted Daphne survey. This survey was distributed to the relevant stakeholders and professionals to assess the perceived importance, current demand, and relevance of the predefined skill groups results obtained from the Desk Research phase.
- **Section 3: Expert Interviews.** The final section details the qualitative insights obtained from in-depth interviews conducted with national industry experts. These interviews serve to validate, complement, and provide deeper context to the survey results, ensuring that the identified competencies accurately reflect the realities of the professional landscape.

By integrating these three dimensions—existing best practices, broad stakeholder perceptions, and expert validation—this report aims to establish a clear and robust framework for the professional profiles required in the sector, ultimately guiding the subsequent educational and vocational training developments of the DAPHnE project.

3 Best practices analysis

3.1 Best Practice 1 – Data Journalism Education in Greek Higher Education

Description:
Greek universities have increasingly incorporated data journalism into journalism and media curricula through dedicated courses, specialisations, and degree programmes. Examples include the Data Journalism course offered by the Department of Audio and Visual Arts at Ionian University, the Computational Journalism Specialization programme developed through the National and Kapodistrian University of Athens, the Data and Participatory Journalism course offered by Aristotle University of Thessaloniki (AUTH), as well as journalism degree programmes that integrate data journalism competencies, such as the BA in Media Production – Journalism at Metropolitan College. In addition, several Master's programmes in Journalism and Media across Greek universities include digital journalism, data-informed communication, and analytical competencies as part of their curriculum.

Links to the websites:

- Ionian University – Data Journalism: https://dmc.ionio.gr/en/studies/undergraduate/courses/1413/
- Computational Journalism Specialization: https://compjournalismen.ntlab.gr/?page_id=24
- AUTH – Data and Participatory Journalism: https://media.jour.auth.gr/course/euj209-data-and-participatory-journalism/
- Metropolitan College – BA in Media Production & Journalism: https://www.mitropolitiko.edu.gr/en/programmes-of-study/faculty-of-culture-communication/ba-in-media-production-journalism/
- Journalism & Media Master's Programmes: https://www.mastersportal.com/study-options/268845114/journalism-media-greece.html

Why is relevant: The collection of Higher Education initiatives identified in Greece demonstrates the gradual institutionalisation of data journalism within journalism education. While approaches vary across institutions, several common trends emerge. First, universities increasingly recognise the importance of data literacy as a core journalistic competency, integrating data collection, analysis, interpretation, and visualization into journalism curricula. Second, programmes increasingly combine traditional journalistic values with computational methods, introducing students to emerging areas such as machine learning, data mining, audience analytics, and participatory journalism.

These initiatives directly support several competency areas identified within the DAPHnE framework, particularly Data Journalism & Investigation, Data & Analytics, Visualization & Content Production, and Communication & Storytelling. The Computational Journalism Specialization is particularly noteworthy because it introduces advanced computational methods without requiring prior technical expertise, thereby lowering barriers for journalism students. Similarly, the AUTH course demonstrates how data journalism can be combined with participatory media practices and audience engagement, reflecting contemporary developments in digital journalism.

Collectively, these programmes illustrate how Higher Education institutions can prepare future journalists to operate in increasingly data-rich information environments while maintaining a strong focus on public interest journalism, critical thinking, ethical reporting, and effective storytelling.

3.2 Best Practice 2 – Professional and Vocational Training Ecosystem for Data Journalism

Description:
Alongside formal university education, Greece has developed a growing ecosystem of vocational and professional training opportunities focusing on data journalism and investigative reporting. Notable examples include the Data Journalism Workshops organised by iMEdD Lab, the Investigative and Data Journalism training programmes offered by the Mediterranean Institute for Investigative Reporting (MIIR), and the Data Storytelling: Bringing Data to Life course delivered by Bilginç IT Academy. These initiatives target journalists, media professionals, researchers, and lifelong learners seeking to develop practical data journalism competencies.

Links to the websites:

- iMEdD Lab: https://lab.imedd.org/en/
- MIIR: https://miir.gr/en/
- Bilginç IT Academy: https://bilginc.com/gr/training/data-storytelling-bringing-data-to-life-18-training/

Why is relevant: The vocational and professional training ecosystem identified in Greece provides an important complement to formal university education. Unlike traditional academic programmes, these initiatives are strongly practice-oriented and focus on immediate industry needs. Participants are introduced to data journalism tools, investigative methodologies, open-data resources, visualization techniques, accountability reporting practices, and data storytelling approaches that can be directly applied in professional contexts.

These initiatives are particularly relevant to the DAPHnE project because they illustrate how lifelong learning and professional development can contribute to strengthening the data journalism ecosystem. The iMEdD Lab workshops expose participants to contemporary tools and methodologies widely used in international data journalism practice, while MIIR emphasises investigative reporting, public accountability, and evidence-based journalism. Bilginç IT Academy focuses on narrative construction and communication strategies, highlighting the importance of transforming data into meaningful stories that can engage diverse audiences.

Together, these initiatives contribute to the development of competencies across multiple DAPHnE competency areas, including Data Journalism & Investigation, Data & Analytics, Communication & Storytelling, Professional & Collaborative Skills, and Media, Ethics & Governance. Furthermore, they demonstrate the importance of collaboration between educational institutions, journalism organisations, and professional training providers in addressing rapidly evolving industry needs and supporting the continuous upskilling of journalists throughout their careers.

4 National Survey Results

This section presents the findings of the national survey conducted in Greece as part of the DAPHnE project. The survey aimed to explore the perceived importance of the competency groups identified during the desk research phase and to gather insights from professionals and stakeholders involved in journalism, media, communication, education, and related sectors. A total of 21 responses were collected from the Greek sample. Participants represented a diverse range of stakeholder groups, including journalists, media organisations, higher education institutions, civil society organisations, public authorities, researchers, and communication professionals. Although the sample is relatively small, it provides useful insights into how different actors within the Greek media and communication ecosystem perceive current and future skills needs in the field of data journalism and data communication. As shown in Figure 1, the largest groups of respondents were journalists and data journalists, representatives of higher education institutions, and media organisations. The participation of stakeholders from academia is particularly noteworthy, reflecting the growing interest of Greek universities in data journalism, digital communication, and data-driven storytelling. At the same time, the involvement of media professionals ensures that the findings also reflect the realities and needs of the labour market.

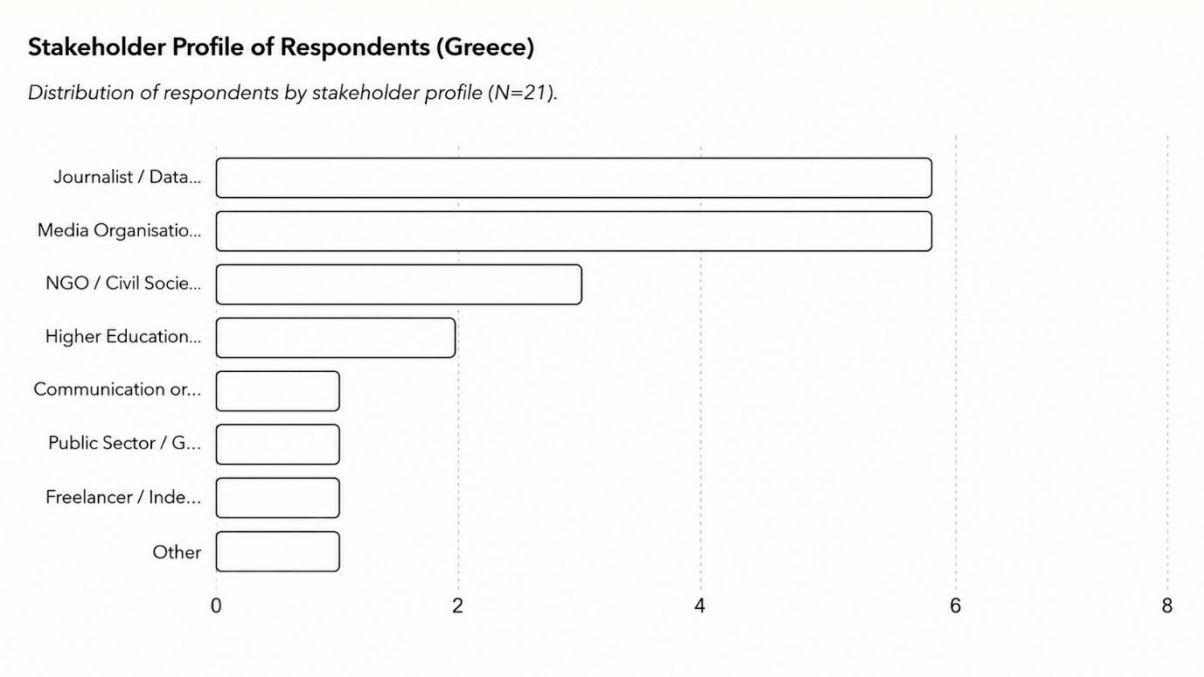


Figure 1. Stakeholder Profile of Respondents

As shown in Figure 1, the Greek sample includes a diverse range of stakeholders. Journalists and Data Journalists, together with representatives of Media Organizations and Newsrooms, constitute the largest groups of respondents (6 responses each). Higher Education Institutions are also represented, alongside NGOs, public sector organizations, communication professionals, freelancers, and other stakeholders. This distribution provides a balanced overview of both academic and professional perspectives within the Greek data journalism ecosystem.

Participants were also asked about their familiarity with the concepts of Data Journalism and Data Communication. Overall, the responses indicate a relatively high level of awareness and familiarity with these concepts. Most respondents reported being either “well familiar” or “very much familiar” with data journalism, suggesting that data-driven approaches to reporting and communication are increasingly recognized within the Greek media landscape. This finding is not surprising given the growing visibility of initiatives such as iMEdD, investigative journalism projects, specialized university courses, and professional training opportunities that have emerged in recent years.

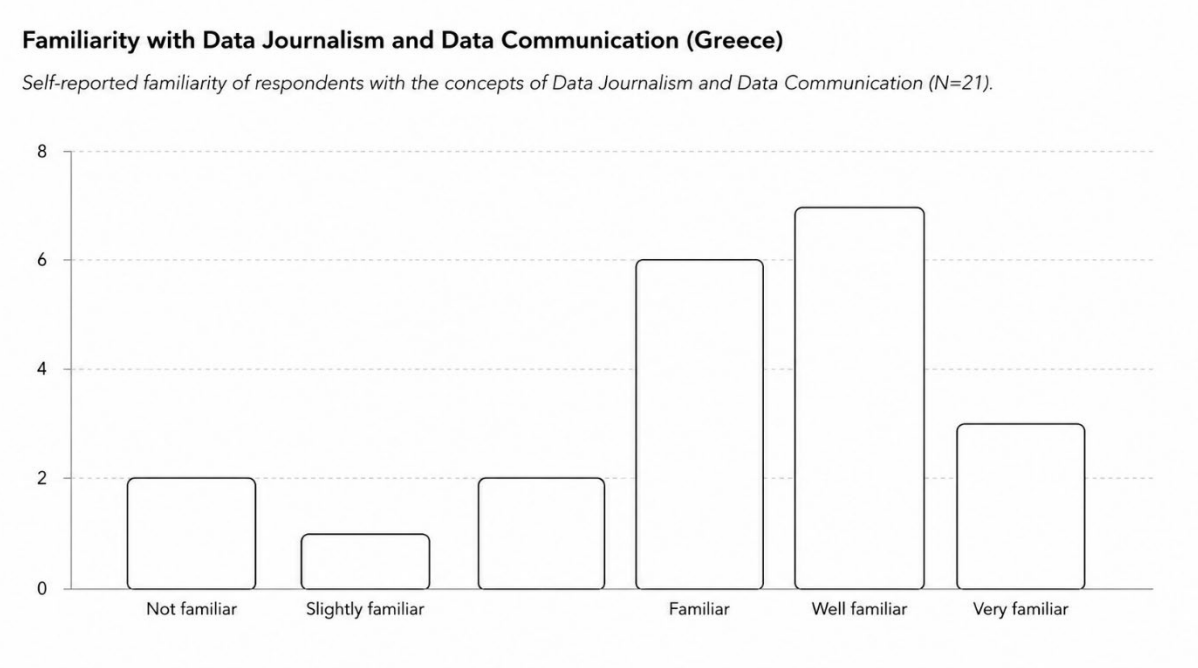


Figure 2. Familiarity with Data Journalism and Data Communication

Figure 2 presents respondents' familiarity with the concepts of Data Journalism and Data Communication. Overall, the results indicate a relatively high level of awareness among the Greek sample. Most respondents reported being either *familiar*, *well familiar*, or *very familiar* with these concepts, accounting for approximately three quarters of the total responses. Only a limited number of participants indicated low levels of familiarity. This finding suggests that data-driven approaches to journalism and communication are increasingly recognised across the Greek media ecosystem, reflecting the growing presence of data journalism initiatives, specialised training opportunities, and academic programmes in the field.

The survey further explored the importance of the competency groups proposed within the DAPHnE framework. Overall, respondents considered all competency areas important, indicating that data journalism is increasingly viewed as a multidisciplinary field requiring a combination of technical, analytical, editorial, and communication skills.

Particular importance was attributed to competencies related to Data Journalism and Investigation, Communication and Storytelling, and Media, Ethics and Governance. This suggests that Greek stakeholders continue to view journalism fundamentals, ethical responsibility, and the ability to communicate complex information effectively as central requirements for professionals working with data.

At the same time, respondents also recognised the importance of Data and Analytics, Visualization and Content Production, and Digital Media and Tools. These findings highlight the growing need for professionals who are able not only to collect and analyse data, but also to transform data into meaningful stories that can be understood by different audiences.

Interestingly, while Artificial Intelligence and Emerging Technologies were generally perceived as important, they did not appear to be considered as critical as core journalistic, analytical, and storytelling competencies. This may indicate that, within the Greek context, stakeholders still prioritise foundational journalistic skills over more specialised technological competencies, although they acknowledge that the role of AI is likely to become increasingly important in the coming years.

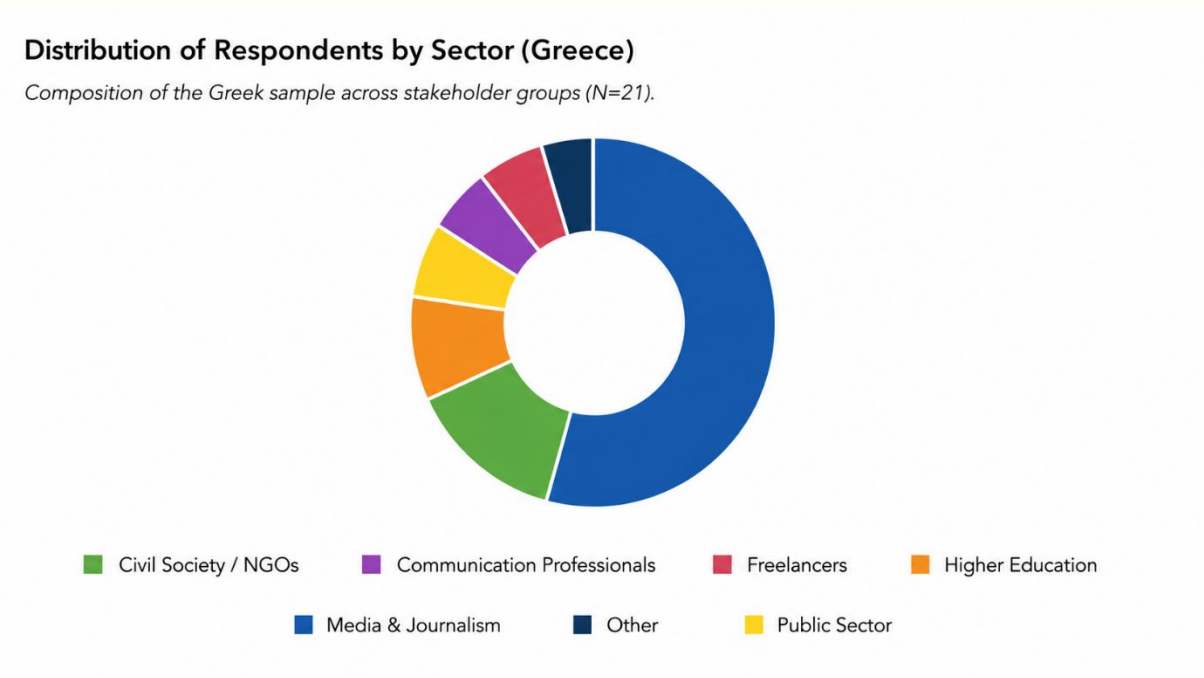


Figure 3. Distribution of Respondents by Sector

Figure 3 provides an overview of the sectoral distribution of respondents participating in the Greek survey. More than half of the sample originates from the media and journalism sector, including journalists, data journalists, and media organisations. Civil society organisations and higher education institutions also account for a significant share of responses, while public authorities, communication professionals, freelancers, and other stakeholders are represented to a lesser extent. This distribution highlights the strong engagement of actors directly involved in journalism and media production, while also ensuring that perspectives from academia, civil society, and public institutions are included in the analysis. The diversity of the sample contributes to a broader understanding of current skills needs and training priorities within the Greek data journalism ecosystem.

The survey also included an open-ended question inviting respondents to share additional comments and identify competencies that they considered missing from the proposed framework. The responses reveal several recurring themes.

First, many participants highlighted the importance of critical thinking and analytical reasoning. Several respondents stressed that technical skills alone are not sufficient and that

professionals need to be able to critically evaluate sources, assess the quality of data, identify biases, and interpret findings responsibly.

Second, respondents emphasised the importance of statistical literacy and methodological understanding. Beyond knowing how to use digital tools, participants argued that professionals should be able to understand how data are collected, analysed, and interpreted in order to avoid misleading conclusions.

Third, ethical considerations emerged as a recurring concern. Participants referred to issues such as transparency, accountability, privacy protection, and responsible data use, highlighting the need for strong ethical foundations in data-driven journalism.

Finally, several respondents pointed to the importance of collaboration and interdisciplinary work. Data journalism projects often require journalists to work alongside researchers, developers, designers, and communication specialists. As a result, teamwork and cross-disciplinary communication were identified as valuable competencies that deserve further attention within future training programmes.

Overall, the survey findings suggest that Greek stakeholders view data journalism as a field that combines technical expertise with strong journalistic principles. While there is clear recognition of the importance of emerging technologies, respondents continue to place particular value on critical thinking, ethical responsibility, analytical skills, and effective storytelling. These findings provide useful guidance for the development of future educational and training activities within the DAPHnE project.

5 Expert Interviews

Following the desk research and national survey analysis, two expert interviews were conducted in Greece with professionals actively involved in journalism, data journalism, media innovation, and artificial intelligence. The objective of these interviews was to validate the competency framework developed during the previous phases of the project, identify potential gaps, and explore emerging trends that are likely to influence the future development of data journalism and data communication in Greece. The interviews provided valuable insights into the current state of the profession and confirmed many of the findings emerging from both the literature review and the survey results. At the same time, they highlighted several areas where the proposed competency framework could be strengthened to better reflect the rapidly evolving media landscape.

5.1 Interview 1

Full Name: <Anonymized data>
Organization/Role: Senior Advisor and Media Expert, <Anonymized data>

Conclusions:

<Anonymized data> emphasized that data journalism in Greece remains relatively underdeveloped compared to other European countries. According to his perspective, one of the major challenges is the limited availability of specialised training opportunities in data journalism, investigative methodologies, and open-source intelligence (OSINT) practices.

While generally supporting the proposed competency framework, he suggested several additions and refinements. In particular, he highlighted the importance of integrating OSINT techniques, forensic investigation methods, data verification, and data evaluation skills as distinct competencies. He also argued that Freedom of Information should be understood as a fundamental journalistic principle rather than as a standalone competency.

A key theme emerging from the interview was the growing importance of artificial intelligence. <Anonymized data> argued that AI-related competencies should receive greater emphasis within the framework, particularly AI ethics, AI governance, responsible AI use, AI agents, and algorithmic transparency. He also stressed the increasing relevance of immersive technologies such as virtual and augmented reality for future storytelling and data visualization practices.

Regarding future priorities, he identified Data Journalism & Investigation, Data & Analytics, and AI & Emerging Technologies as the most important competency areas for the next five years. He noted that future professionals will need to combine strong investigative skills with advanced data literacy and a critical understanding of AI technologies in order to produce trustworthy and impactful journalism.

5.2 Interview 2

Full Name: <Anonymized data>
Organization/Role: Data Journalist, <Anonymized data>

Conclusions:

<Anonymized data> largely validated the proposed competency framework, noting that it accurately reflects the fundamental stages of data journalism, namely data collection, data analysis, and data visualization. However, he stressed that all competencies should ultimately serve the broader goals of accountability, transparency, and public-interest journalism.

A central observation from the interview concerned the growing integration of artificial intelligence across the journalistic workflow. <Anonymized data> highlighted that AI tools are already being used extensively within media organizations, often without clear guidelines or transparent practices. Consequently, he argued that AI literacy, ethical AI use,

transparency, accountability, and critical evaluation of algorithmic outputs should become core elements of future professional training.

He also described the Greek data journalism ecosystem as fragmented and still relatively marginal within mainstream news production. According to his assessment, data journalism is frequently perceived as incompatible with the fast-paced logic of contemporary newsrooms, despite its increasing value for evidence-based reporting.

Looking ahead, <Anonymized data> identified Artificial Intelligence & Emerging Technologies, Media Ethics & Governance, and Data & Analytics as the three competency areas that will become most important in the coming years. He further emphasized the need for journalists to develop the capacity to critically assess AI-generated content while maintaining editorial responsibility and public trust.

5.3 Summary of Interview Findings

Overall, the interviews strongly validated the competency framework while also identifying several areas for enhancement. Both experts agreed that data journalism in Greece is still developing and that substantial investment in training and capacity-building is required. They highlighted the need to strengthen competencies related to data verification, data evaluation, AI literacy, and responsible AI use.

Artificial intelligence emerged as the dominant theme across both interviews. While both experts acknowledged its transformative potential, they stressed that journalists must be equipped not only with technical AI skills but also with the ethical, critical, and governance-related competencies required to use these technologies responsibly.

The interviews also revealed a growing need for competencies related to OSINT, investigative methodologies, cross-border collaboration, immersive storytelling technologies, and advanced data analysis techniques. Finally, both experts emphasized that future data journalists must be able to combine technical expertise with strong ethical awareness, critical thinking, and a commitment to public-interest journalism.

6 Conclusions

The preparation of this National Report, developed within the framework of the DAPHnE project, reveals a strong alignment between the national best practices identified, the findings of the survey, and the perspectives shared by industry experts. Together, these results provide a comprehensive picture of the current state of data journalism and data communication in Greece and highlight the competencies that will be increasingly required in the years ahead.

The findings demonstrate that data journalism in Greece is gradually maturing, supported by emerging university programmes, professional training initiatives, and growing awareness among media professionals. However, both the survey respondents and expert interviewees emphasized that significant challenges remain, particularly regarding the limited availability of specialised training opportunities and the uneven integration of data-driven practices within Greek newsrooms.

Across all stages of the research, participants consistently highlighted the importance of foundational journalistic competencies. Data Journalism & Investigation, Communication & Storytelling, and Media, Ethics & Governance emerged as the most highly valued competency areas. Critical thinking, analytical reasoning, statistical literacy, source verification, and ethical responsibility were repeatedly identified as essential skills that underpin effective data journalism. These findings suggest that technological competencies alone are insufficient and must be accompanied by strong editorial judgement and a commitment to public-interest journalism.

At the same time, the report highlights the growing importance of Artificial Intelligence and emerging technologies. Although survey respondents tended to prioritise traditional journalistic competencies, the expert interviews revealed a strong expectation that AI-related skills will become increasingly important in the near future. AI literacy, ethical AI use, algorithmic transparency, AI governance, and the critical evaluation of AI-generated content were identified as priority areas for future professional development. The experts also stressed the need to prepare journalists for emerging practices involving automation, immersive technologies, and advanced computational methods.

Another important finding concerns the growing relevance of investigative and verification-related competencies. Skills associated with OSINT methodologies, data verification, forensic investigation techniques, and evidence-based reporting were identified as important additions to the existing competency framework. These competencies are becoming increasingly relevant in a complex information environment characterised by disinformation, synthetic media, and rapidly evolving digital technologies.

Finally, the report highlights the importance of lifelong learning, interdisciplinary collaboration, and practice-oriented education. Future educational and training programmes should combine technical, analytical, ethical, and communicative competencies through hands-on learning approaches that closely reflect professional realities. Strengthening collaboration between universities, media organisations, civil society actors, and professional training providers will be essential to ensuring that future journalists are equipped to navigate increasingly data-driven and AI-mediated information environments.

Overall, the Greek findings suggest that the future of data journalism will depend on the successful integration of technological innovation with the enduring principles of journalism: transparency, accountability, critical inquiry, and service to the public interest.


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