



# DATASET E-ZINE

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[www.data-set.eu](http://www.data-set.eu)



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## Greetings from DataSET!

The DataSET consortium greets you this fine autumn 2019 with a brand new issue of the DataSET magazine, dedicated to highlighting the achievements within our project and bringing the awareness of the need to instill the so-needed data skills among entrepreneurs. Since our last publication, the DataSET team has advanced towards the development of the project intellectual outputs: we are proud to present you the [VET Guide to Data Skills Development Report](#), which you can access on our website.

Besides bringing you the news from the consortium, we aim to highlight the importance of building data literacy in Europe by bringing you the articles from our partners. Read about why entrepreneurs should care about data analytics (p.10), the benefits of big data for businesses (p.12) and the methods to analyse the data available to virtually anyone (p.14). Do not miss an interview with the leader of the EDISON project, which lays bricks towards establishing data science profession (p.17). On the meta-political level, data is recognized as an instrument for steady societal growth – dive deeper into the history of the policies surrounding the European Digital Single Market (p.20).

We hope that this magazine will inspire you to analyse your own approach (or create one) to your company's data or for your student-entrepreneurs. If you are interested in learning more about the DataSET project or would like to share your perspectives, [get in touch with us](#). We wish you a pleasant read!

*DataSET Consortium*





*“We should teach students, as well as executives how to examine data, and how to use these tools to make better decisions”*

*Dan Ariely*

## DATASET OUTPUTS WILL BENEFIT:

### **SME MANAGERS**

who need to learn how to grow their smart data capacity even with limited resources.



### **EARLY STAGE ENTREPRENEURS AND BUSINESS STUDENTS**

who need to know how to build data skills into their business plans from the get go



### **ENTREPRENEURSHIP EDUCATION PROVIDERS**

who recognise big data is as an important trend, but lack understanding of its relevance to their daily work, as well as the pedagogical strategies to teach it to others.



### **ENTERPRISE AND ECONOMIC DEVELOPMENT STAKEHOLDERS**

who need scalable strategies for upskilling our populations in data skills and digital competencies in general.



## OUR GOAL:

The Data Set Project will improve the quality and relevance of entrepreneurship education by improving the ability of VET and HEI policy makers and practitioners to understand, teach and develop smart data, thus providing business owners, early stage entrepreneurs and students with solid smart data skills training which they will use to help grow their businesses.

## OUR OBJECTIVES:



Synthesise a Guide to Data Skills Development



Create a DataSet Training Course



Train the first generation of DataSet business trainers



Establish an Online Learning Platform for self-learning



## The Second DataSET Partner Meeting: Alcala de Henares, Spain

From the 30th to the 31st of May, 2019, the DataSET project consortium paid a visit to the birthplace of Cervantes, a World Heritage Site which transcends the 16th century spirit through its early Renaissance architecture – Alcala de Henares, Spain. With a warm welcome from the representatives of Universidad de Alcala, the consortium held the second transnational partner meeting to share the progress and discuss the future of the project.

The two-day programme provided the participants with the opportunity to discuss the status-quo of the development of the intellectual outputs, dissemination efforts and plans for the sustainability of the project.

### IO1 – VET Guide to Data Skills Development

We are delighted to announce that the first output of the project – the VET Guide to Data Skills Development has been final-

ized. The representative from the partner, co-ordinating the creation of the guide (Sonia Naiba, Momentum) presented the final version of the guide to the consortium. The guide aims to raise the awareness of the value of the data skills for current and future entrepreneurs and to analyze what contemporary data skills are already known to the entrepreneurs and business advisors. In addition, the guide summarizes the strategies for teaching data skills to entrepreneurs, including the best practices.

Specifically, the guide gives the overview of the following:

- i) The results of a data skills survey, outlining the current skills and skills deficits of business trainers and advisors in participating countries;
  - ii) Review of the policy environment regarding data skills for entrepreneurs and data skills education, at both EU and national and regional level;
  - iii) An introduction to strategies for teaching data skills to entrepreneurs, including best practice examples and testimonies.
- The guide is in open access and can be downloaded [here](#)

### IO2 – DataSet Open Education Resources

The DataSet Open Education Resources will be comprised of a curriculum, trainer's guide and a suite of interactive online learning materials which enable teachers and trainers to enhance entrepreneur's data skills in classrooms and small group training. The Leading partner of this intellectual output, Universidad de Alcala and its representative (Miguel Ángel Sicilia Urbán, a Data Scientist himself), presented

the draft methodology for the data skills training model and led an extensive discussion on the DataSET curriculum with the consortium. Resulting in almost finalized draft, all the partners are to pilot test the curriculum in small group session with business advisors and entrepreneurs in fall 2019.

The training model and its accompanying resources will be tested during the Train the Trainers Learning Activity in Denmark to be held in April 2020.

### IO3 – DataSet Online Course

In the meeting the partners discussed the preliminary plans of translating the open educational resources, created as a part of the previous DataSet output, into an online interactive learning course for the entrepreneurs at all stages of their business development. Self-paced and open to virtually anybody, the course will open the opportunities for popularizing the acquisition of data skills among wider European (and international) population.

In addition to the talks about the intellectual outputs, the partners have briefly discussed the future arrangements for the learning week, dissemination and exploitation plans and administrative issues regarding the project's implementation phase.

Overall, the meeting was a success in terms of its outcomes, supported by the generous hospitality of the host partner. The partners enjoyed the traditional Spanish cuisine and its famous tapas and spectacular views of a historic city center of Alcala de Henares. The next partner meeting is planned to take place in Leitrim, Ireland on 10-11 October, 2019.



# The VET Guide to Data Skills Development: a full report is out

How much do you know about the data that gets generated around you daily? Do you use any of it? Or better asked: Are you aware of how to use the data to make your business thrive? Erasmus+ DataSET project team has embarked themselves on a journey to raise awareness regarding the value of data skills for entrepreneurs and broaden knowledge of what contemporary data skills are, as well as find out how they can be trained. The fruit of the research has recently been published on the project website as [the VET Guide to Data Skills Development](#) that is primarily compiled for the VET entrepreneurship educators, but also for policy makers and investors in entrepreneurship education. Let's have a quick peek inside the guide!

## What has been done and how?

The VET Guide provides a reader with a needs assessment on data skills of business trainers and advisors in Ireland, Northern Ireland/UK, Spain, the Netherlands and Denmark. To collect the data, an Internet survey was chosen as a method

that would allow for a more diverse survey sample as it was shared widely using an exciting network and beyond. The survey asked 12 questions of various types that took less than 10 minutes to fill out. It was completed by 33 business advisors from five participating countries. The survey sought to answer the following key questions:

- How is the role of a business advisor evolving? Are data skills relevant/required?
  - What are the top 5 data skills or data training topics that DataSET should consider?
  - What are the current data skills deficiencies of business advisors?
  - Are business advisors aware of how they can apply data skills in their work to support, train and mentor SME's?
- If curious about the content of the survey, please, follow the link.

## What do we know now?

When assessing how the role of a business advisor is evolving, age certainly plays

a role. The business advisors aged 20-40 primarily identified themselves as mentors (73%) whereas the remaining part of the cohort see themselves as trainers. The business advisors falling into the 40+ category have a more balanced distribution of the mentor vs trainer roles, with a new role of a Counsellor constituting 4% of the total number of respondents. The results also provide a curious insight on the types of support and areas of expertise the business advisors see themselves competent in. As for the relevance, only 21% (largely coming from 40+ years old cohort) indicated their proficiency of knowledge regarding their data skills.

Regarding the skills deficiencies, collected data shows that programming/coding as well as technical/digital skills are the least comfortable the respondents feel with. However, the suggestions for the DataSET project about what data skills they would recommend to put a focus on when training, the aforementioned skills were not prioritized as high as the application of

data to solve problems/inform business ideas. Apparently, the surveyed business advisors would prefer to skip the technical part of the issue and proceed with actionable data. With regard to programming/coding not being highly relevant, one of the respondents explained the reasoning:

*"I don't believe coding or programming to be relevant to me or the SME. They can access basic business data from things like Google Analytics, Facebook Analytics etc. - understanding and accessing the data they already have within their reach would be a key first step in helping them to understand the power and potential of data."*

Speaking of the perceived awareness of the business advisors on applying data skills in their work to support, train and mentor SME's, the results show a very diverse territory to consider. To find out more about it as well as see a more comprehensive analysis of the survey results, check the e-version of the VET Guide available on [www.data-set.eu](http://www.data-set.eu).







## Data Analytics Skills for Entrepreneurs: why care?

The assumption that data analytics is an area of expertise guarded and explored exclusively by data specialists is being widely challenged. Today, data mining, its visualization and analysis are used by virtually any professional layer in large corporations to improve individual and organisational performance. However, data is yet to find its way to become a source for decision-making among entrepreneurs of small and medium enterprises (SMEs), that are rarely well equipped with necessary skills to collect and understand mysterious numbers about their customers. Developing such skills can be a demanding solo trip, unless accompanied with relevant and effective training.

### Who has pulled the strings?

According to Tom Davenport, Professor of IT and Management at Babson College (USA), the ever-growing need in data analytics skills among entrepreneurs, has been dictated by two interrelated factors

[1], i.e. a growing mass of data generated on the Internet and a fast-paced increase of online companies generating these data. Well-known US companies, including Facebook, Amazon and Google, as well as the Chinese tech giants like Baidu and TenCent, have 'made entrepreneurs care more about [data] analytics' and showed how it can be used to achieve intended results. Like their larger competitors, the SMEs with data-literate professionals can benefit from the well-processed data and data-driven decision-making in many ways, e.g. aligning their business strategy, improving their offerings, and highlighting their competitive advantage among others in a respective market segment.

**'First step in solving any problem is recognizing there is one.'** by Will McAvoy from *The Newsroom*

Though large corporations are making the most out of the possibilities offered by data analytics tools and techniques, micro- and SMEs, constituting 99% of all companies [2] in Europe, experience difficulties in applying them. As reported by OECD [3], 'software applications to manage business information flows are popular among large firms (more than 75% adoption rate in 2014) but less used by SMEs (less than 20%).' Later, the Strategic Policy Forum on Digital Entrepreneurship [4] echoed the same concern stating that 'small European businesses are slow to change and over 41% of EU companies have yet to adopt any of the new advanced digital technologies including ... big data analytics.' Yet sounding dismal, such statistics opens new doors for those who are competent to show the way-out.

### What's in the data analytics combo for present and future entrepreneurs?

Back in 2009, Hal Varian, chief economist at Google, predicted that a data savvy specialist would be 'a sexy job [to have] in the next 10 years.' [5]. Particularly, he meant statisticians and data scientists. Little did he know that the "sexiness" of data analytics skills would travel far beyond these jobs. More recently, in 2018, Dr. Soraya Sedkaoui, senior lecturer at Université de Montpellier (France) and data analyst, denoted that future entrepreneurs, able to slice and dice the data, should demonstrate [6] not only soft skills and a general entrepreneurial streak, but also sex up their scope of competences with the expertise in Math and Stats, data mining and data modelling. By and large, the next generation of entrepreneurs is expected to use data analytics methods 'to extract value and enhance their professional capabilities.'

Notes:

1. Even Entrepreneurs Need Analytics: <https://www.forbes.com/sites/tomdavenport/2018/04/18/even-entrepreneurs-need-analytics/#487686254ff9>
2. Fact Sheets on the European Union: <http://www.europarl.europa.eu/factsheets/en/sheet/63/small-and-medium-sized-enterprises>
3. Enhancing the Contributions of SMEs in a Global and Digitalised Economy: <https://www.oecd.org/mcm/documents/C-MIN-2017-8-EN.pdf>
4. Accelerating the digital transformation of European industry and enterprises: [https://ec.europa.eu/growth/content/accelerating-digital-transformation-european-industry-and-enterprises\\_en](https://ec.europa.eu/growth/content/accelerating-digital-transformation-european-industry-and-enterprises_en)





## Benefits of Big Data for Business Organizations

Not a secret, virtually any size enterprise can reap substantial benefits from collecting, analysing and utilising the big data. What are those benefits and which domains of the business development smart data analytics can advance?

### Risk Analysis for Start-Ups

Start-up company owners have a lot of variables to consider when they are building their business. With limited human resources, the entrepreneur can easily fall into a trap by day-to-day operations, while overlooking other important factors contributing to reaching their business goals. Data analytics can help a nascent business assess their social impacts, economic importance and their accomplishments.

Data analytics does not automatically mean looking inwards. External data gathering can help understand the market and the environment of the business. A

simple data gathering technique can be just re-analyzing peer-reviewed journals, newspapers, social media feed and surveys. The information already gathered by these sources can allow a business to avoid common problems and save money.

### Product or Service Re-Development

Are you currently running a business? Then you may be surprised to learn that data analytics can be of great importance to you. You may already know about the importance of feedback and be able to use it to benefit your business, but collecting the information is only one aspect of what you could be collecting to help your business. Big Data can help you figure out how customers perceive your product or service and in turn, you will be able to re-vamp or redevelop your product or service to improve its reputation. Designing the product around the needs and wants of your base clientele is a key to a successful business.

### Product or Service Expansion

Consumers simply know what they want. They may not always know what they need, but they will always know what appeals to them and where their priorities lay. It is because of this understanding that they will do their own research before they commit to a product or service. They will read reviews and watch Youtube videos regarding the product and potential comparison products after maybe seeing an advert that piqued their interest.

With "big data", different business can profile customers in a far-reaching manner. Business owners should be aware of these review and comparison sites to

check the various desires as well as the preferences of their customers. Based on it, they can offer the products and services tailored to their customers. They can also do a cost analysis of the customer's desires to see if a product or service is viable in the first place.

### Targeted Marketing & Data Management

Once you have gathered your data in the form of customer feedback, emails, names, social media account insights and customer addresses; you may wish to employ computer-aided software to begin advanced information breakdowns for marketing purposes. For instance, you may wish to pinpoint a where on the map the majority of your clients come from, the gender split or simply which social media platform is predominantly being used by your clientele. All this information will allow you to create tailored marketing campaigns especially if your marketing budget is limited.

Staff members should be trained on how to gather data as a standard and about "big data" management, which is not as simple as you think and there can be large penalties associated with mismanagement of customer data. Where "big data" is sensitive to the identity of a client or customer, such as financial, medical or criminal records, data must be encrypted and protected from public access. By this, we mean to say that this sort of data should be kept offline and in no way accessible from a cloud source. Such breaches of privacy can be costly to any company and in some instances mark the end of business entirely due to the fines incurred.





## Methods of Analyzing Data

Implementing a business intelligence software in your company or organisation is more than simply about collecting additional data; it is about making this data work for you in the form of actionable information. The amount of data an organization can collect today from a variety of sources offers is staggering. The ability to see what's behind the curtain, understand what campaigns or actions are working can help a business owner prepare for future trends.

However, without having a proper understanding of the data that is collected, all you those figures, numbers and statistical social insights become substance with no context.

It should be noted that there isn't anyone correct method for analysing data. It is primarily dependent on the needs of a business and the data they aim to collect that will dictate which methods of analysis will best suit and even at that, techniques can be fluid to deliver the best results. In saying that, there are some tried and tested methodologies that are built into different software because they do work.

The first step in choosing the right data analysis technique for a data set begins with understanding what type of data it is. It can either be quantitative or qualitative data. Someone may ask what exactly is the difference between the two? Quantitative data deals mostly with the volume

of information. It is the cold, hard facts that can only be brought in by the numbers. For example, the number of sales, click-through rates (CTR) on online marketing campaigns, return on investments (ROI) and other such measurable figures that can be scrutinised objectively.

Qualitative data is a little more ambiguous and nebulous, but no less valuable. It deals more with being subjective, needs a degree of introspection and very much open to interpretation. This sort of data would apply to things like customer reviews, surveys and even watching for customer and staff interactions with a product or service. It is about the quality of how a product or service is being perceived and this makes methods of analysing this sort of data a bit more difficult since it can often be less structured.

Below are three different methods that can be used to measure quantitative data

and two that deal with qualitative data to hopefully might help a business begin to categorise and breakdown the data they may already hold.

### Measuring Quantitative Data

#### Regression Analysis

In order to understand regression analysis fully, it is imperative to understand the following terms: 1. Dependent Variable: This is the main factor trying to understand or predicted.

2. Independent Variables: These are the factors that can be hypothesised have an impact on the dependent variable.

Whereas you can only have one dependent variable, you can have a myriad of independent variables. Regression analysis is the measurement of the independent variables to the dependent variable and when understanding the relationship to the dependent variable can be used to help a company make a prediction about



future trends with a good degree of confidence. Regression analysis is a reliable method of identifying which variables have an impact on a topic of interest. The process of performing a regression allows you to confidently determine which factors matter most, which factors can be ignored, and how these factors influence each other.

### **Hypothesis Testing**

Also known as “T Testing”, is used to infer the result of a hypothesis performed on sample data from a larger population. The test tells the analyst whether or not his primary hypothesis is true. For instance, a business owner may assume that more hours of work are equivalent to higher productivity. How exactly would they know this to be factually the case? Before implementing longer work hours, it’s important to ensure there’s a real connection to avoid spending money on wages or even whether the longer hours would even be received well by staff. A business decision made without knowing how it may affect staff may have the opposite effect where productivity may drop.

### **Monte Carlo Simulation**

Monte Carlo simulation is a technique used to understand the impact of risk and uncertainty in financial, project management, cost, logistics and other forecasting models. A Monte Carlo simulator helps one visualize most or all of the potential outcomes to have a better idea regarding the risk of a decision. To test a hypothesis or scenario, a Monte Carlo simulation will use random numbers and data to stage a variety of possible outcomes to any situation based on any results. It will allow

the analyst to understand what random variables can throw a monkey wrench in a company’s project or strategy.

### **Measuring Qualitative Data**

#### **Content Analysis**

Content analysis is a research technique used to make replicable and valid inferences by interpreting and coding textual material. By systematically evaluating texts (e.g., documents, oral communication, and graphics), qualitative data can be converted into quantitative data.

#### **Narrative Analysis**

Narrative analysis is a genre of analytic frames whereby researchers interpret stories that are told within the context of research and/or are shared in everyday life. This might include interpreting how employees feel about their jobs, how customers perceive an organization, and how operational processes are viewed. It can be useful when contemplating changes to corporate culture or planning new marketing strategies.

*Provided by: East Belfast Enterprise*

*Image Credit: Sabrina Gelbart via [www.pexels.com](http://www.pexels.com)*



## **Interview: building data science profession**

One of the largest job advertisement website Glasdoor has identified Data Scientist as the top job in their listings for three consecutive years. However, while the demands for Data Scientists is on the rise, we experience quite a noticeable gap in understanding Data Science as a profession, let alone having a comprehensive training schemes for data scientists. To address this gap, The EDISON Project set an aim to contribute to understanding and building the data science profession through creating EDISON Data Science Framework. In this interview, we share with you the first-hand insights from the Project Director and Senior Researcher at System and Network Engineering Group, University of Amsterdam Yuri Demchenko.

**Can you briefly summarize the ideas behind EDISON project? What are its main outcomes and its relevance to a**

### **data-fueled economy?**

[The EDISON project \(2015-2017\)](#) was focused on coordinating and supporting activities to foster creation of the Data Science profession in Europe (and beyond) that involved interaction with multiple stakeholders from academia, universities, standardisation bodies and professional organisations. The main outcome of the EDISON project is the [EDISON Data Science Framework \(EDSF\)](#) that includes the following components:

- Data Science Competence Framework (CF-DS),
- Data Science Body of Knowledge (DS-BoK), and
- Data Science Model Curriculum (MC-DS), and Data Science Professional Profiles (DSPP).

The EDSF provides a conceptual basis for the Data Science Profession definition, targeted education and training, profes-



sional certification, organizational capacity building, and organisation and individual skills management and career transferability.

The definition of the Data Science Competence Framework (CF-DS) is a cornerstone component of the whole EDISON framework. CF-DS provides a basis for the Data Science Body of Knowledge (DS-BoK) and Model Curriculum (MC-DC) definitions, and further for the Data Science Professional Profiles definition and certification.

The CF-DS incorporates many of the underpinning principles of the European e-Competence Framework (e-CF3.0) and provides suggestions for e-CF3.0 extension with the Data Science related competences and skills. The CF-DS and DSPP have also adopted and intend to comply with the structure of European ICT Professional Profiles and European Skills, Competences, Occupations (ESCO) Framework. Corresponding information is provided in both documents CF-DS and DSPP.

This presented Data Science Competence Framework definition is based on the analysis of existing frameworks for Data Science and ICT competences and skills, and supported by the analysis of the demand side for Data Scientist profession in industry and research. The presented CF-DS Release 3 is extended with the skills and knowledge subjects/units related to competences groups. The document also refined the Data Science workplace skills definition that includes the Data Science professional skills (Acting and thinking like Data Scientist) and the definition of the

general “soft” skills often referred to as 21st Century skills.

Currently EDSF is maintained by the EDISON Community initiative (coordinated by University of Amsterdam) with the Github working area.

**What are the target professional groups for the EDISON project implementation? Is there a variety of professional roles, domains and uses for which EDISON is applicable?**

The Data Science Professional Profiles (DSPP) defines the whole set of professional profiles related to Data Science, Data Management and Governance, and Data Stewardship. DSPP defines 22 profiles from desk and support workers to enter data to Big Data infrastructure management, Data Science and Analytics professionals, and organisational management profiles (e.g. Chief Data Scientist, Chief Data Officer, etc.). The EDSF is also applicable and provides a set of tools to define other Data Science and Analytics (DSA) enabled professions in other science, industry and business domains and sectors.

**How can EDISON be extended or adapted for particular or specific uses?**

EDSF has a modular organisation and all documents are extensible with continuous work in progress and regular releases. Extensibility points are defined for each of document:

- Data Science Competence Framework (CF-DS),
- Data Science Body of Knowledge (DS-BoK), and

- Data Science Model Curriculum (MC-DS), and Data Science Professional Profiles (DSPP).

We are currently running the call for the contribution to the next release 4 to be issued with the deadline 30 September 2019. Check EDISON community to read more: EDISON community

**Would you imagine EDISON (or a subset of it) as a basis for training entrepreneurs that seek to startup in the domains of Big Data and business analytics?**

One of tasks in the future/ongoing EDSF development is to define the DSA (Data Science and Analytics) training profiles for managers of the data driven companies. Recent research and developments created tools and methodologies to create tailored curricula based on required professional profiles and competences/skills gap defined based on individual or team benchmarking.

The EDSF contains also definition of the Data Science workplace skills (also called transversal skills) and 21st Century skills that are widely applicable for data driven companies, Industry 4.0 and digital transformation.

Are there some competences and skills in EDISON that are essential for the business aspects of data-intensive companies? Possibly, there are skills that are essential for managers for understanding their own capabilities, cost and business implications? There are example of using EDSF for different domains. A number of currently running projects use EDSF for different research and business domains:

- ELIXIR, Rltrain, CORBEL - Bioinformatics Research Infrastructure
- MATES - Digitalisation of Maritime Industry
- FIRsFAIR - definition of the Data Stewardship curriculum

Many other projects are influenced by the EDISON methodology and EDSF conceptual model. [Conclusive, the skills and competences from the EDISON Framework are applicable in a wide range of fields and relevant for starting entrepreneurs].

**Can you briefly tell us on the future roadmap of EDISON?**

[The University of Amsterdam (UvA) team, initial EDSF developer, will work as an interim coordinator and facilitator with the view to create the community delegated coordination group that will oversee wider EDSF development and implementation.

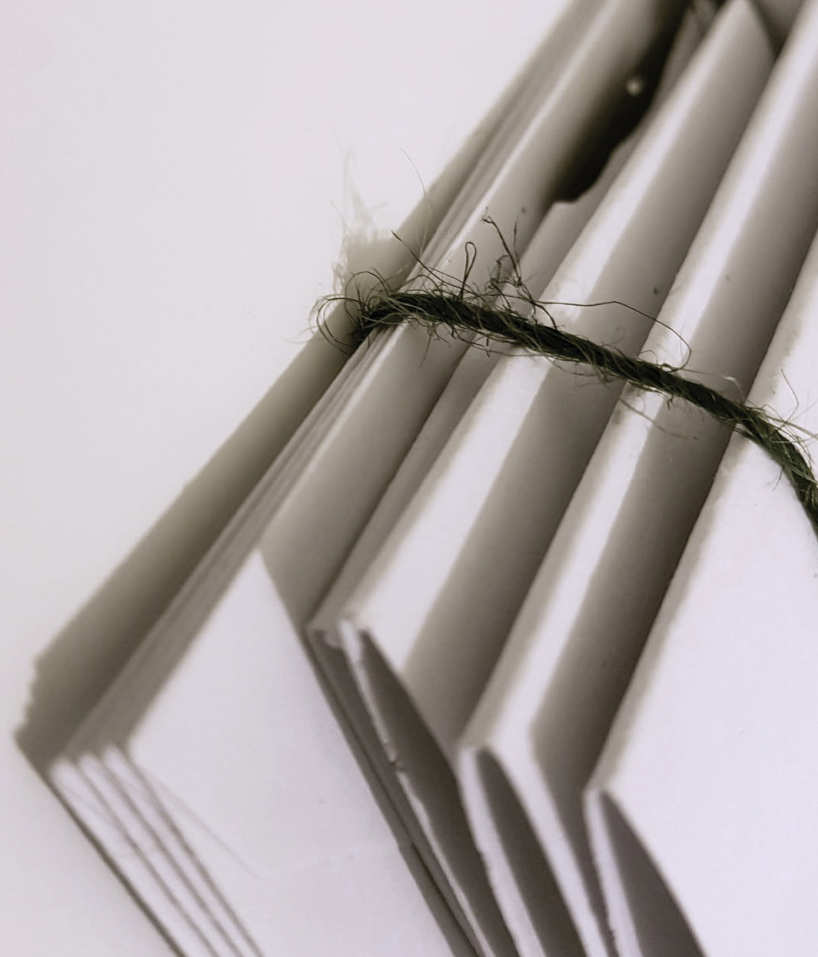
Participation in the EDISON/EDSF initiative and Open Source project is open to any party who can contribute with the framework development, implementation, promotion and sponsoring or funding.

The github project serves as a hub for all future activities on the EDSF development, call for contribution and search for new funding and/or sponsorship.

The content of the wiki will grow with the time and will integrate the EDISON project legacy including the DataSciencePro community portal

*Interviewed by: Miguel-Ángel Sicilia Urbán, The University of Alcalá. Image credit: the EDISON Peoject*





## EU Data Policy-Making: from open access to developing data economy

The development of computer technology and digitalization made it possible to mine and store a massive amount of data. It allows businesses to identify new trends which can be used to make better decisions and seize new opportunities.

Big data has become a powerful driver for economic growth, competitiveness, innovation, job creation and societal progress. The EU aims to reap the full benefits of “big data fever” and maintain steady growth of Digital Single Market. According to the recent study (<http://datalandscape.eu/study-reports/second-report-facts-and-figures-dataset>), the value of EU big data was more than €376 billion in 2018, accounting for 2.6 % of the EU GDP. With time-bound policy measures and favorable legal conditions, the value of the EU data economy can more than double by 2025 and represent more than 6 % of the overall EU GDP (<http://datalandscape.eu/study-reports/second-report-facts-and-figures-dataset>). Big data brings new opportunities and the EU is acting fast to bring predictable rules of games to the table.

The need for decisive steps and concrete actions firstly emerged in 2003 when the re-use of open public sector information (PSI) became legal for commercial and other purposes (<https://ec.europa.eu/digital-single-market/en/open-data>). It established a minimum set of rules and the beginning of ‘open data’ era. Transparency and fair competition became key components of the ‘PSI Directive’ (Directive 2003/98/EC) <https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32003L0098>. The focus of

this initiative was primarily economic and it had a great impact on the further development of new services based on novel ways to combine and make use of public sector information (PSI). Open data policy came into force.

The next big stepping-stone was the launch of the EU strategy ‘Towards a thriving data-driven economy’ in July, 2014 (<https://ec.europa.eu/digital-single-market/en/news/communication-data-driven-economy>). It was acknowledged that “data is at the centre of the future knowledge economy and society” and an action plan was adopted. It was based on the following pillars: community building and developing framework conditions for the single EU big data market. Fostering open data policies, E-infrastructure, Internet of Things (IoT) and personal data protection issues were covered in the new EU strategy on the data-driven economy (2014). A special attention was paid to the development of relevant data skills and infrastructures to the benefit of SMEs (<https://ec.europa.eu/digital-single-market/en/news/communication-data-driven-economy>).

Developing a common European data space and economy, the EU faced three main obstacles to data mobility within the EU in 2017-2018. Among them, unjustified restrictions to free flow of non-personal data from Member States, legal uncertainties and lack of trust from main actors. According to the survey (2014) ([https://ec.europa.eu/eurostat/statistics-explained/index.php/Cloud\\_computing\\_statistics\\_on\\_the\\_use\\_by\\_enterprises](https://ec.europa.eu/eurostat/statistics-explained/index.php/Cloud_computing_statistics_on_the_use_by_enterprises)), 38 % of SMEs in the EU-28 lacked trust in data mobility due to security risks. As a re-

sult, the Commission organized a number of public consultations with stakeholders to address the existing issues. As a result, the EU adopted a set of measures (outlined in Communication on “Building a European data economy”) to make a free flow of non-personal data across borders available and regulate new data technologies in terms of data access, portability and liability (<https://ec.europa.eu/digital-single-market/en/policies/building-european-data-economy>). Data privacy regulation was also put on the policy agenda, resulting in the adoption of GDPR and ePrivacy legislation. These measures were designed to enhance digital trust and protect the data privacy for EU citizens (<https://ec.europa.eu/digital-single-market/en/policies/online-privacy>).

The big data agenda transformed from an open access data issue to building a common European data economy throughout the past 15 years. Even though the efforts of EU policy-makers were intensified, the central concern has been still the same: the EU can lose its competitive advantage of a Digital Single Market if it does not build a data-friendly regulatory framework. European SMEs have a risk of losing the competition in global markets if they have limited access to data analytics and data. Financing and the relevant data skills are particularly big difficulties to SMEs that do not have enough resources to invest in the data infrastructure and analytical tools. The EU should take a more proactive approach to support digital transition and further develop the European Data Economy.

*Provided by: UIIN. Image Credit: Sam Johnson via [www.pexels.com](http://www.pexels.com)*



## Data SET project connects 6 partners, coming from the United Kingdom, Spain, Ireland, the Netherlands and Denmark

### East Belfast Enterprise

Established in 1995, East Belfast Enterprise (EBE) is a progressive social enterprise, which was developed to provide incubation workspace and training/mentoring initiatives to support new and established businesses. EBE deliver enterprise, training and support programmes to circa 500 entrepreneurs each year, helping them to start-up and grow their businesses. Over the last 5 years in response to emerging training needs, EBE have extended their business and enterprise development programme to develop specific programmes.



### Canice Consulting Limited

Canice Consulting Limited (CCL) is an outward looking company that specialises in vocational training and innovation support for regional development initiatives. The company operates from a headquarters in Lisburn and brings together a core staff of three and a network of six associates with specialist knowledge in the fields of online learning, blended learning, entrepreneurship education, social inclusion, collective impact and more.



### Momentum Consulting

Momentum is one of Ireland's leading entrepreneurship specialists. An Irish VET organisation, MMS is focused on developing progressive vocational education programmes and platforms to enable entrepreneurs, employees and young people entering the world of work to participate as fully as possible in the contemporary labour market. Much of MMS's work concentrates on interpreting emerging digital platforms across VET systems and building awareness of the innovative approaches available through e-learning and mobile learning (m-learning).



### University Industry Innovation Network

Headquartered in Amsterdam, the Netherlands, the University Industry Innovation Network's (UIIN) mission is to exploit the full value of collaboration and cooperation (open innovation), ultimately making an impact to academia, business and society. UIIN is a prestigious European network with more than 200 members. Each year it hosts the largest conference on University-Industry Interaction in Europe, educating university leaders to develop their entrepreneurial mindset and providing various networking and communication opportunities to its members.



### Universidad de Alcalá

The University of Alcalá (UAH) is a Spanish university with 15 faculties – including a Polytechnic faculty. UAH has more than 20,000 students and is located in a city 35 km northeast of Madrid in Spain. The Computer Science Department of the University of Alcalá is located at the Polytechnic School and has over 60 full time staff and is responsible for the B.Sc., M.Sc. and Ph.D. degrees on a range of Computer Science programmes particularly relevant to Data Set including: Data Science, Deep Learning, Business Intelligence and Big Data, etc.

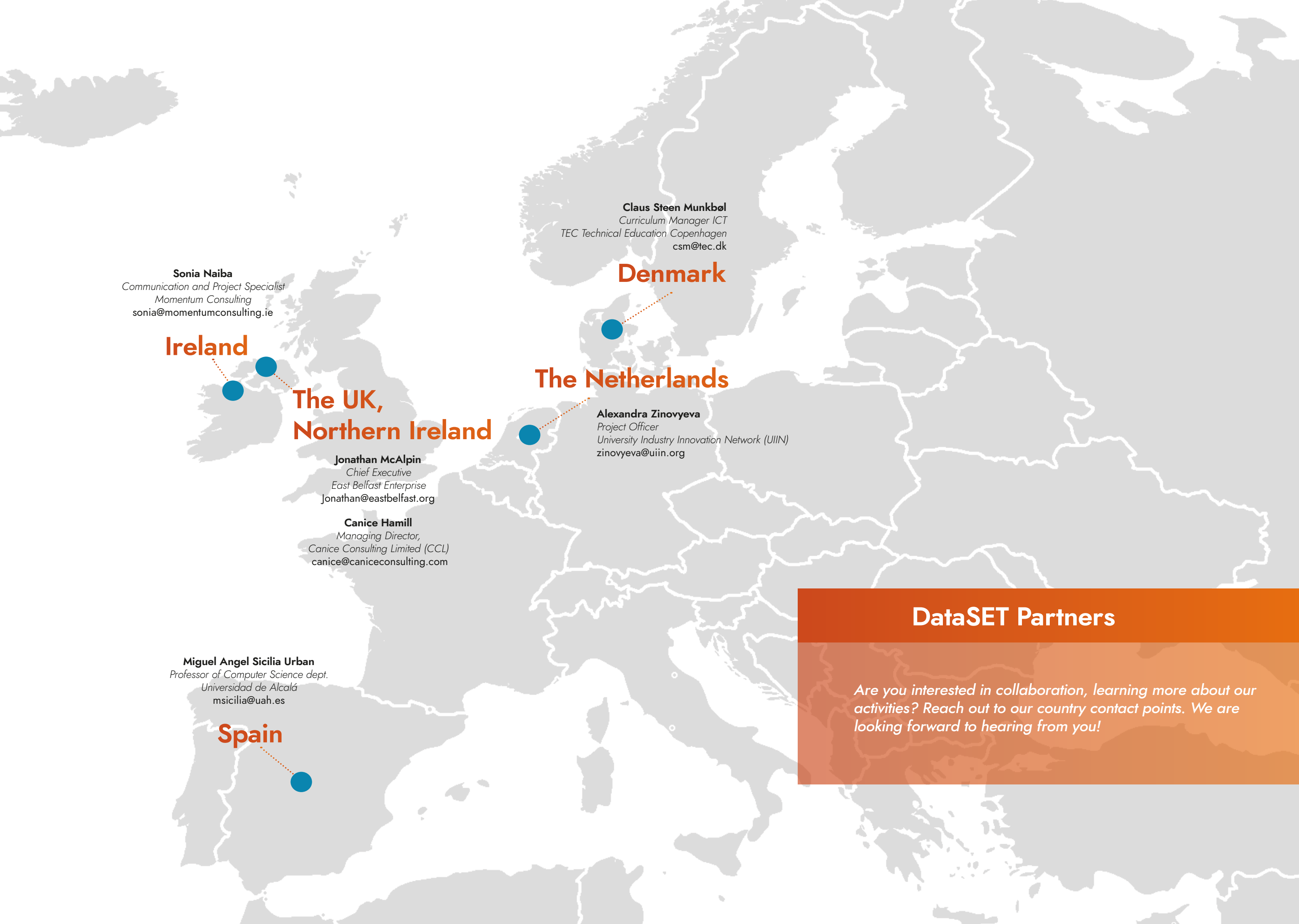


### Copenhagen Technical College

TEC is one of the largest vocational colleges in Denmark. In 5 campuses throughout Greater Copenhagen we offer 20 VET programmes, 3 upper secondary technical examination and numerous adult training programmes. We have a student body of more than 25,000 of which 4,500 are full time students, and a staff of 775. TEC considers innovation as other side of the coin of entrepreneurship, and have become increasingly interested in integrating entrepreneurial skills in a widespread systematic way.







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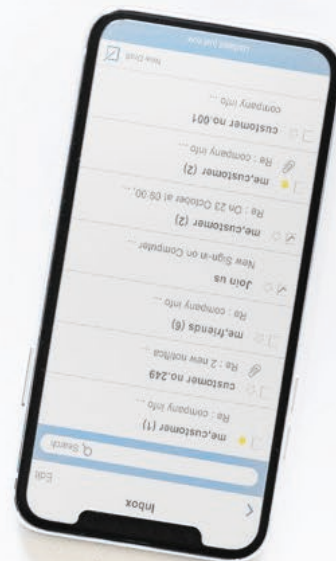
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**DataSET Partners**

*Are you interested in collaboration, learning more about our activities? Reach out to our country contact points. We are looking forward to hearing from you!*



[www.data-set.eu](http://www.data-set.eu)

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