ADA
ADVANCED DATA
ANALYTICS IN BUSINESS

Co-funded by the
Erasmus+ Programme
of the European Union

Survey on Stakeholders in Serbia

ACTIVITY PERIOD 11/2018-06/2019

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Project duration:	36 months

Abstract	This is narrative report about the survey conducted on companies in IT sector related to current status of data science in Serbia and competences of data science professionals

Title of document:	Survey on Stakeholders in Serbia
Work package:	1. Development of a new program in Advance Data Analytics in Business
Activity:	1.1 Analysis of best practise and comparative analysis
Last version date:	15/07/2019
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Dissemination level:	Consortium

VERSIONING AND CONTRIBUTION HISTORY

Version	Date	Revision description	Partner responsible
1.0	15/07/2019	-	SAM
2.0	01/11/2019	Technical corrections	UNS

Activity Report

Serbian Association of Managers is one of the partner's organization in the ERASMUS project Advanced Data Analytics in Business (ADA). During the reporting period, SAM participated in numerous project activities ensuring implementation of the project, with specific focus on identifying business needs regarding Data Analytics, and communication of those needs back to academic partners.

Project Activities so far included:

1. Participation at the Kick off meeting at the University of Novi Sad on 26-27th November 2018 where key activities on each Work Package were analyzed and Action Plan was discussed. Also, main management structures and bodies were elected. Executive Director of SAM Jelena Bulatovic presented the work of Association and main its activities.

2. Participation SAM participated in a study tour of EISTI in Cergy, France from 17th March to 21st March. During the visit, the host presented its experiences related to advanced data analysis to the representatives of all project partners. Also, companies-partners of EISTI presented case-studies about the usage of data science in business. SAM Executive Director presented draft of the Survey on Data Analytics

3. Public promotion of the project via electronic and social media - Articles about ADA project were placed:

    - On SAM web site
        - 18/03/2019
        - 08/05/2019
    - On SAM official Instagram profile:
        - 05/04/2019
        - 09/05/2019

    - On SAM official Linkedin profile:
        - 05/10/2019
    - Executive Director of SAM mentioned ADA project in her interview on N1 television on 04/06/2019

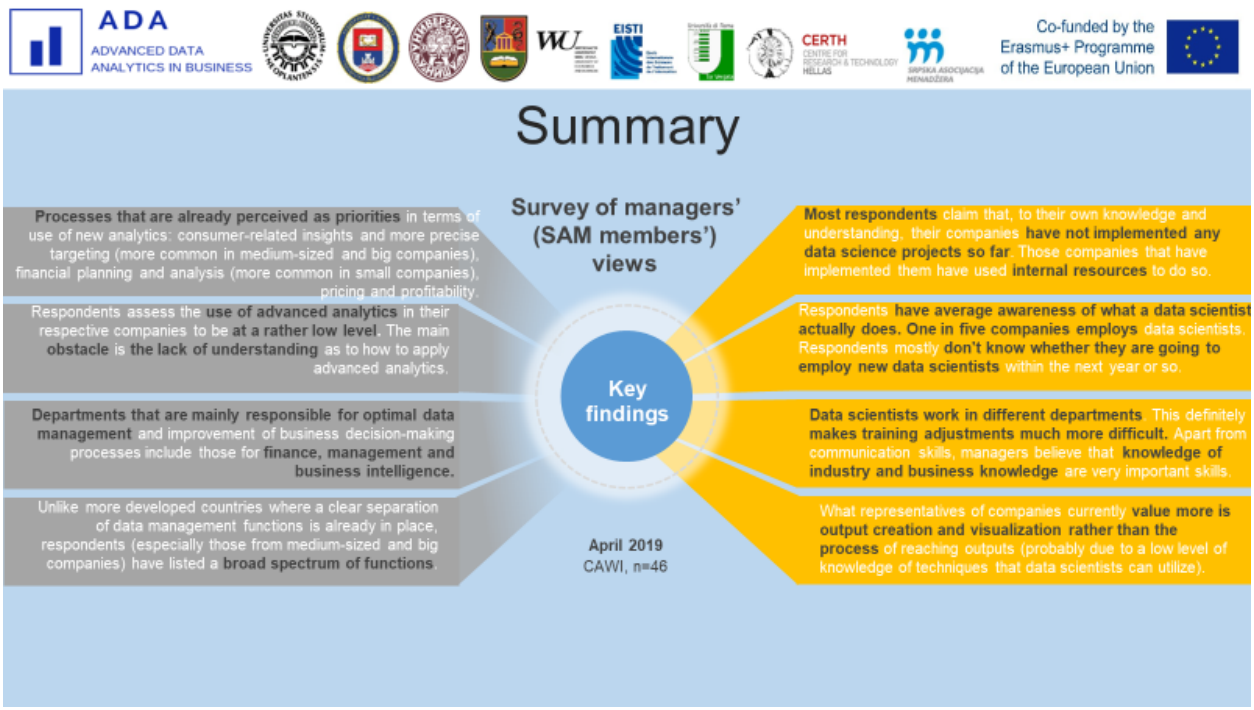
4. In this period key activities for SAM were conducting a research among Serbian companies on their view on Data Analytics in Business and its present and future importance for business. The survey is organized in two phases.

    - The first phase was a quantitative survey conducted on a sample of companies, SAM members with aim to identify the companies' development stage and understand how data scientists may fit into the current organizational structure. Survey was sent to members of SAM, of which 46 fulfilled whole questionnaire and 41 of them partially. There was 4 parts of the survey: demographic section, companies' needs regarding Data Scientist area of work, Description of the Data Scientist Position and expectations from that position within the company, and set of key skills.

- The second phase was a semi-structured discussion with data scientists (or their immediate superiors), which was aimed at getting more in-depth findings. These findings provided have the full picture how far are companies with the integration of Data Scientists in their organizational structures.

This research was conducted in partnership with the Data-Do, a company which specializes in the application of business data to ensure external and internal monetization. Also, research findings were presented to the participants on separate event organized in the premises of Serbian Association of Managers on May 8th.

Key findings of the Survey (complete survey results are attached to this Report)**:**



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Knowledge and skills which are important **for Data scientist to have today and to be an expert in, are:**

- data analytics,
- statistics & algebra,
- data visualization,
- descriptive analysis (transforming data into information),
- to be open towards cooperation with domain experts,
- to work with advance tools,
- to understand data,
- to recognize business problem,
- to shape data,
- to understand basics of strategy and financing,
- to communicate with other sectors and
- to have experience.

Summary – part II

Survey among technical / expert professionals

(May 2019, n=12)

One knowledge which is **particularly important is understanding business processes,** which allows Data scientist to participate in designing them thru defining data that those processes create, as well as IoT and machine learning.

Things which Data scientist **does not need to know excellently**, but does need to understand, is architecture of data and work with data bases (not only to administrate them).

- Processes that are already perceived as **priorities** in terms of use of new analytics: consumer-related insights and more precise targeting (more common in medium-sized and big companies), financial planning and analysis (more common in small companies), pricing and profitability. Medium and small-sized companies today focus on financial planning and analysis, while larger companies focus on creating consumer-related insights and more precise targeting.

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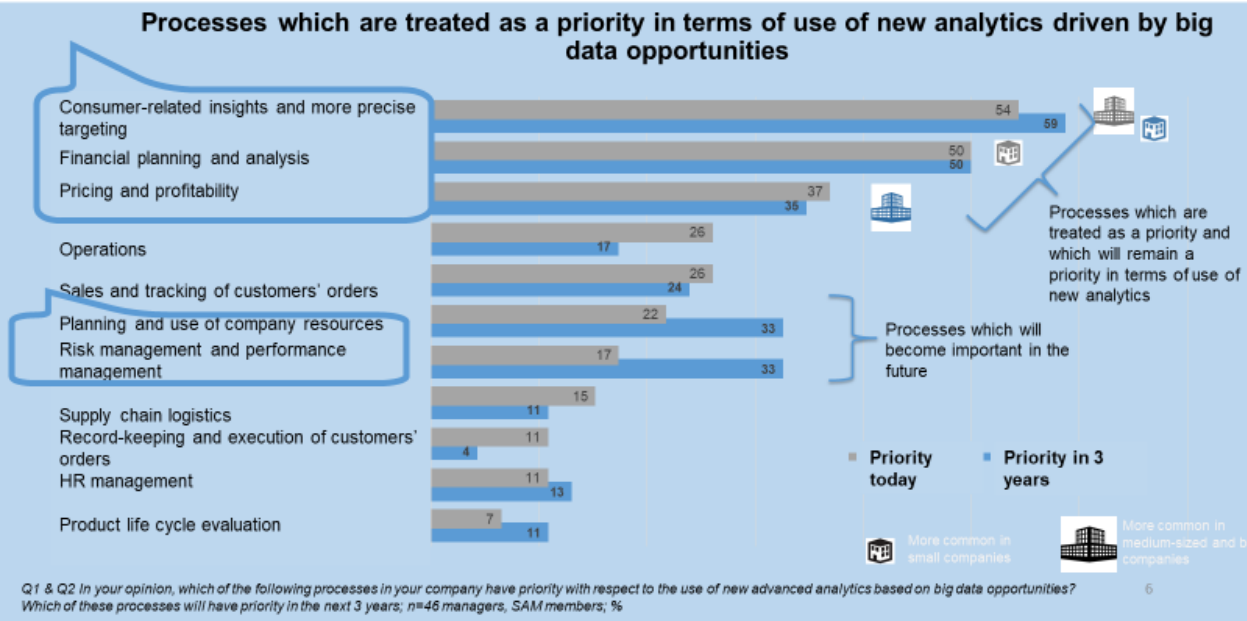
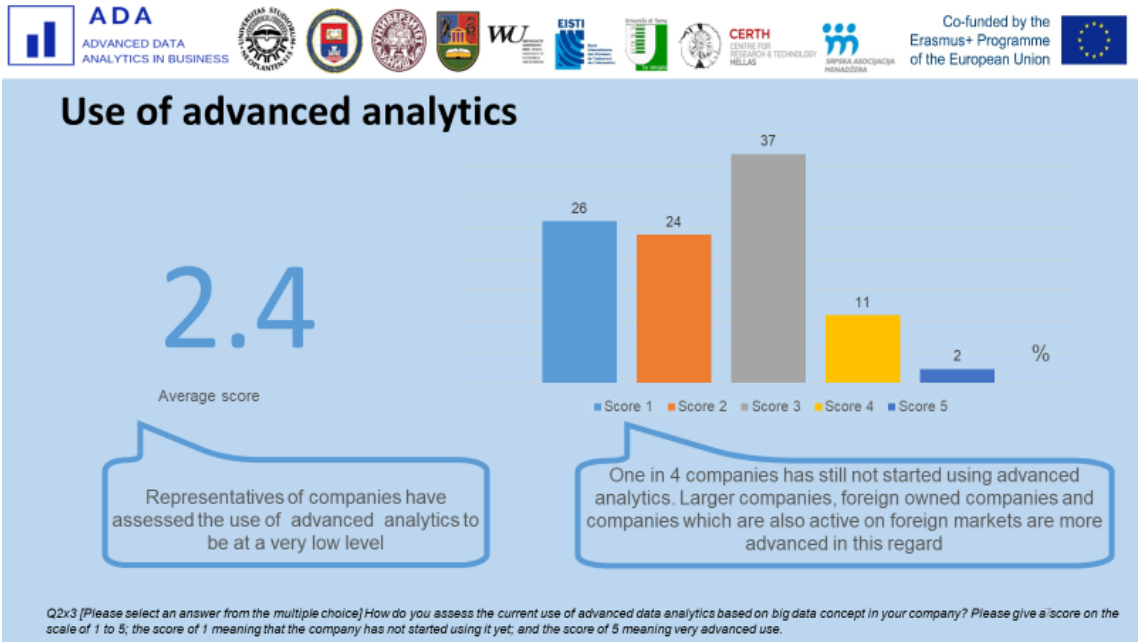
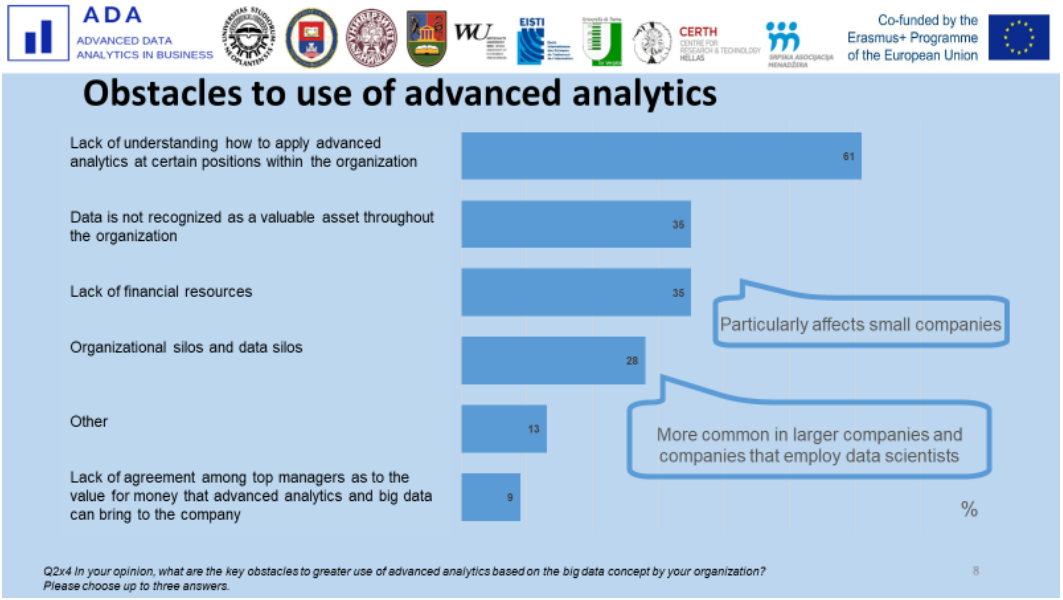


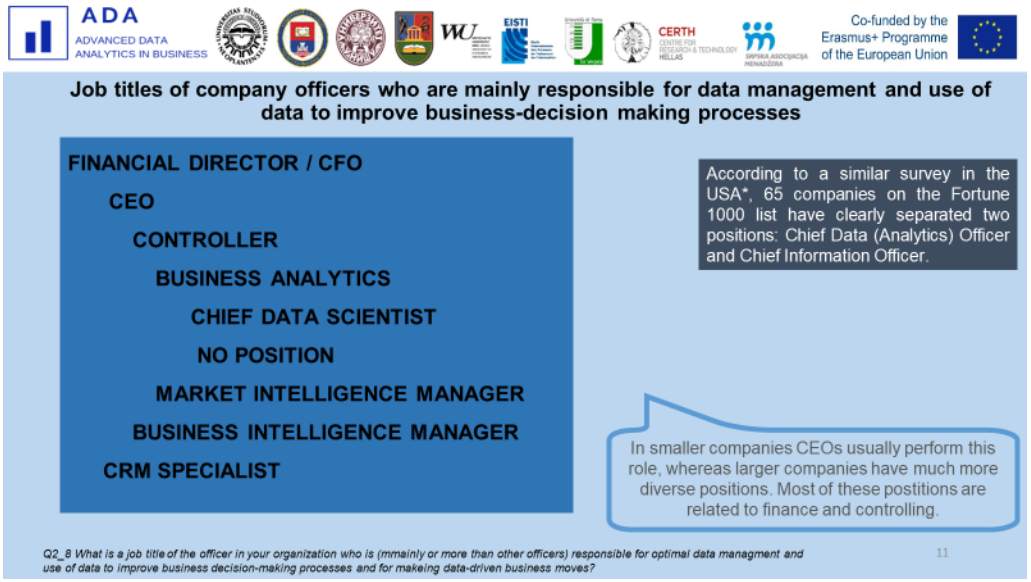
- Surveyed managers have assessed the **use of advanced data analytics** to be at a rather low level (average score is 2.4). One in 4 companies has not even started using advanced data analytics yet, which is particularly alarming given the fact that SAM rallies Serbia's most successful companies (and hence the overall use of advanced data analytics is likely to be substantially lower among businesses in general). Larger companies, foreign owned companies and companies which are also active on foreign markets are more advanced in this regard.



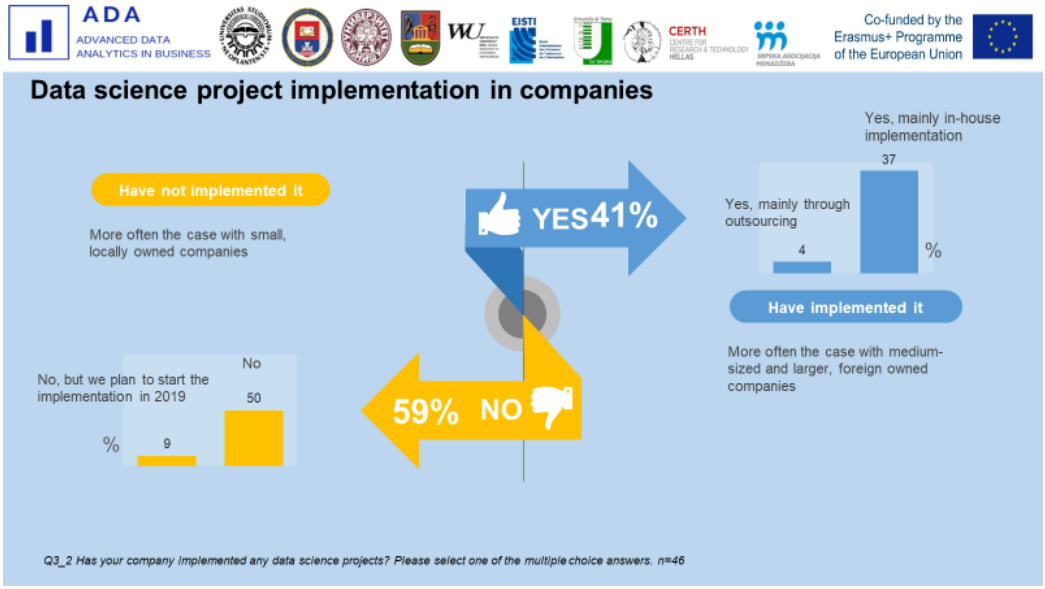
- The main **obstacle** to use of advanced data analytics is the lack of understanding of how to apply it. Smaller companies are also constrained by the lack of financial resources, while larger companies are struggling with organizational silos.



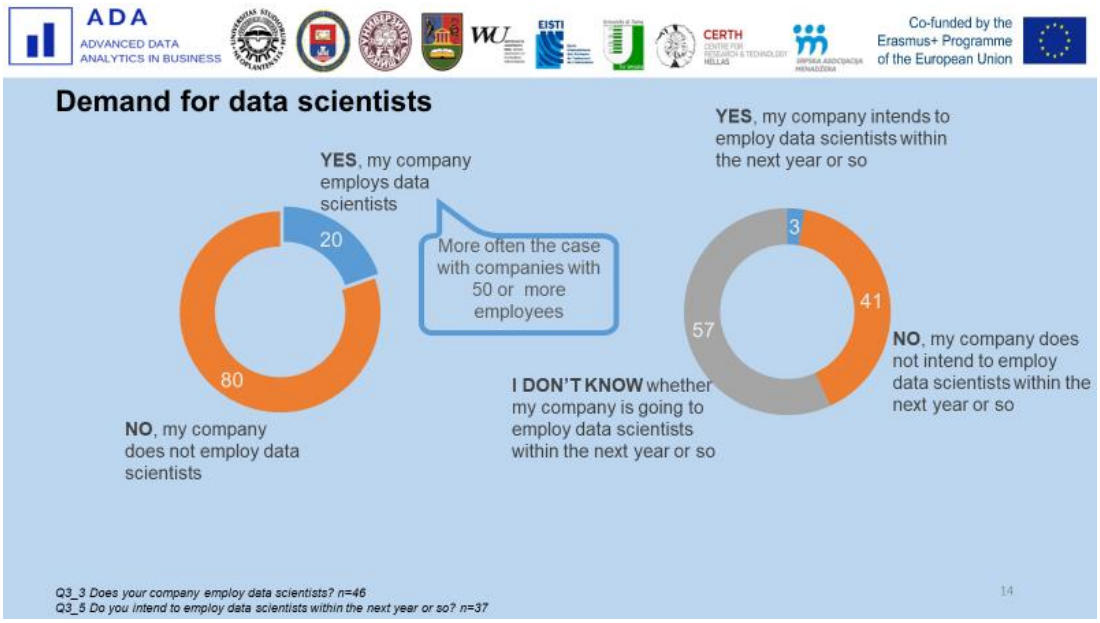
- Respondents in this survey (particularly those from medium-sized and larger companies) list a broad range of **positions** for Data Scientists work: financial manager, CEO, Controller, business analyst, chief of digital, CRM & BI specialist, performance manager, development assistant, sales manager, market intelligence manager etc. In smaller companies, CEOs are the ones who are mainly responsible for data management and data use for purposes of improving business decision making, whereas in larger companies such positions are much more versatile and mostly related to finance and controlling.



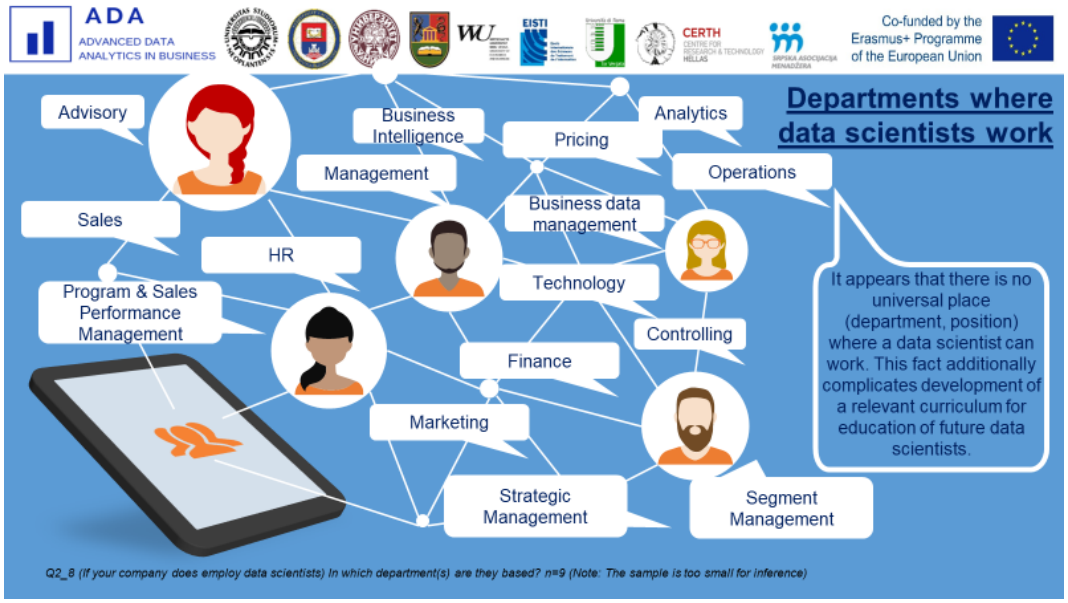
- Almost 2/3 of managers (59%) claim that, to their knowledge and understanding, their respective companies have not implemented a single **data science project** so far. The companies that have done so have used their own internal resources. Very few companies (only 2 of them in the entire sample) have outsourced experts to assist them in implementing data science projects. Logically, data science projects are more commonly implemented by larger companies and foreign owned companies.



- 1 in 5 companies **employs** data scientists and respondents mostly don't know whether they are going to hire new data scientists within the next year or so.

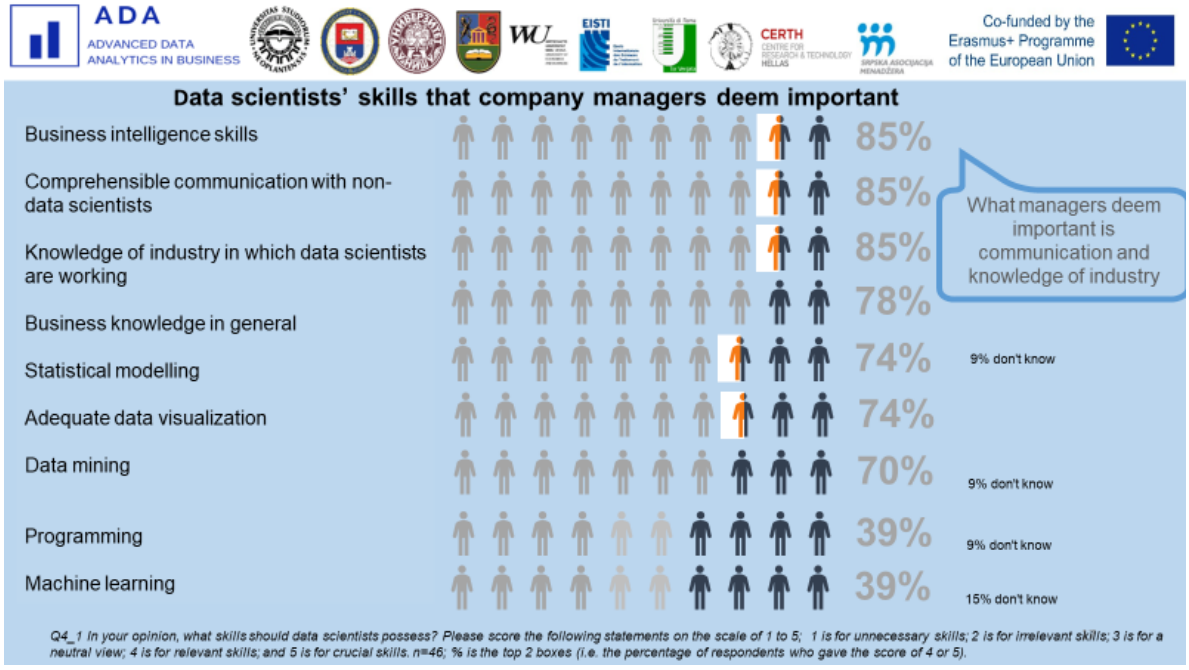


- Data scientists as company staff are rather scattered within organizations, working in various **departments**: Advisory, Sales, Program & Sales Performance Management, Management, Operations, Business Intelligence, Pricing, Analytics, Business Data Management, Technical Department, Controlling, Finance, Marketing, Strategic Management, Segment Management, etc.

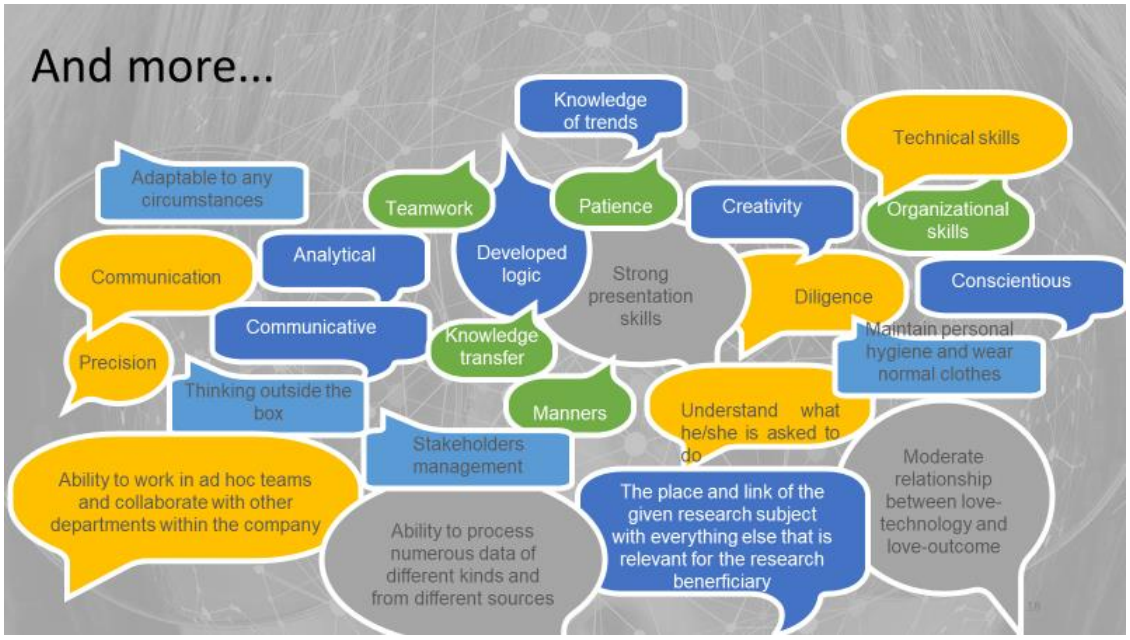


- Apart from communication skills, managers seem to believe that knowledge of industry and business knowledge are very important **skills**. What representatives of companies currently value more is communication and visualization rather than the process of

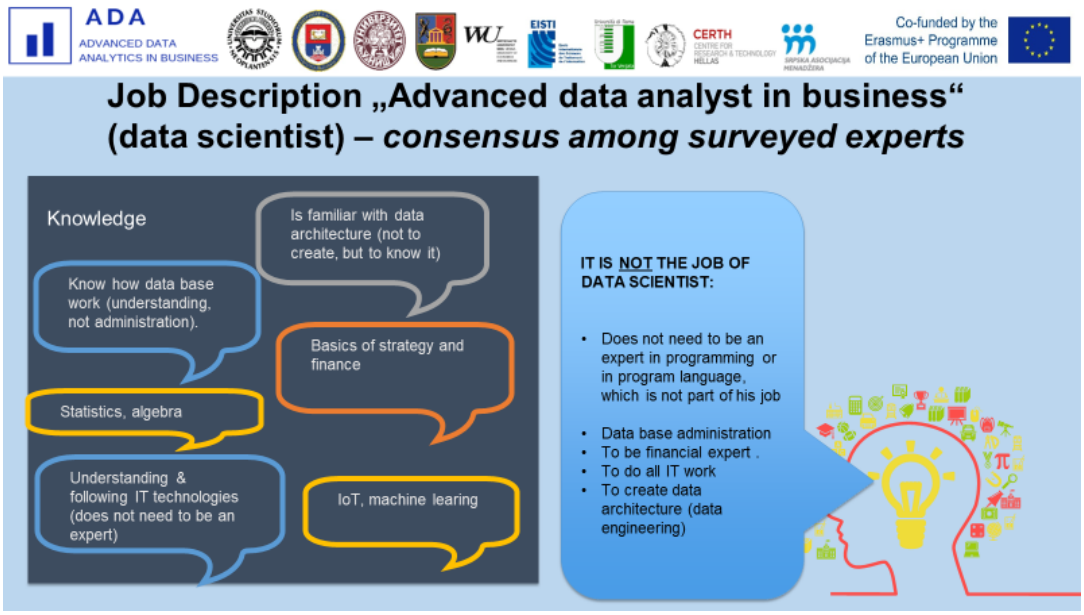
reaching outputs (probably due to a low awareness of techniques that data scientists can utilize).



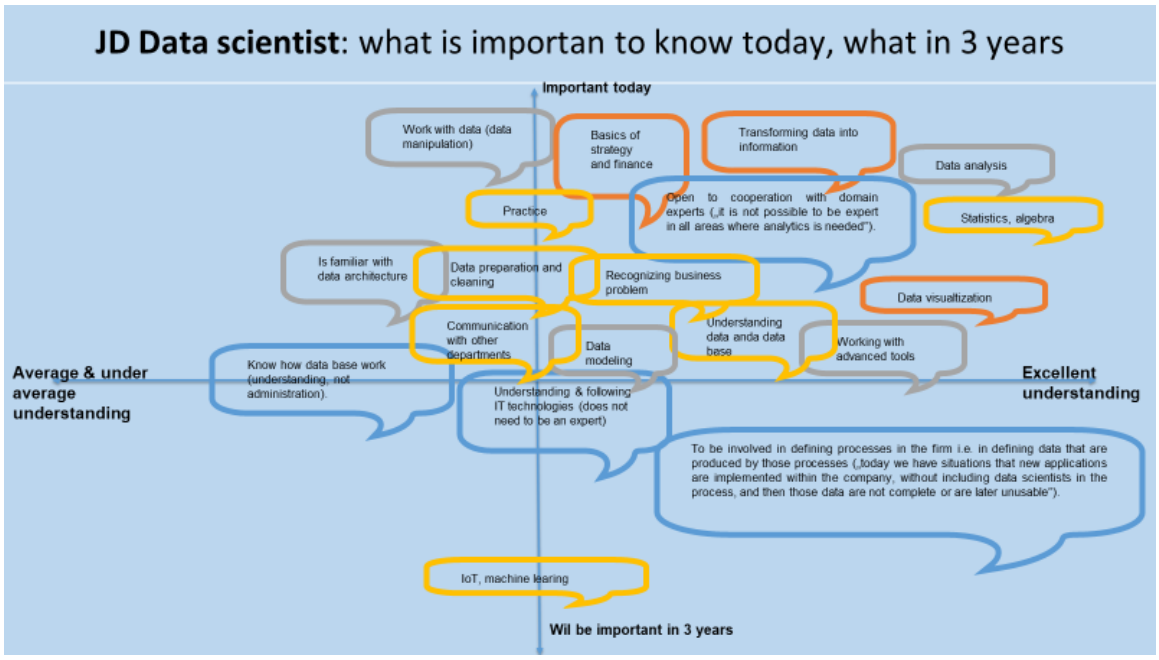
- Given the fact that managers are not fully aware of data scientist's job description, the experts have defined the tasks a data scientist should perform in a company. A data scientist must have **knowledge** of analytics (technical aspect) – from data preparation and cleaning, understanding databases, working with advanced tools, data analysis, modelling and handling to transforming data into information and data visualization. A data scientist is expected to be linked with other positions in a company, as well as to understand and participate in defining processes and data generated by these processes (business aspect).



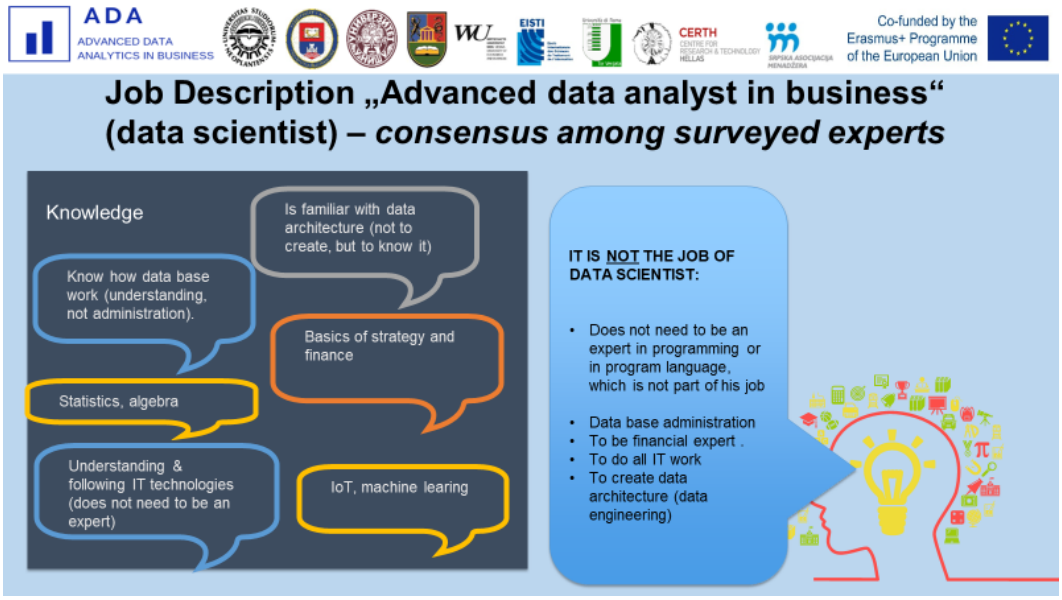
- Data scientist's job description **should not include:** expertise in programming or in a programming language which has nothing to do with his/her work, or IT expertise; database administration; financial expertise; doing everything that has to do with IT; data engineering.



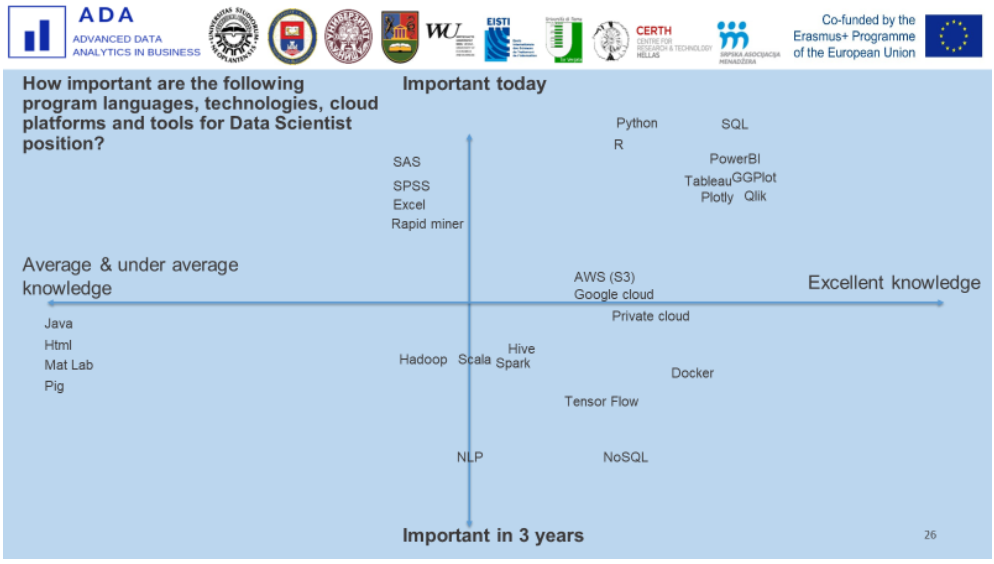
- It is essential that data scientists should **already possess excellent knowledge and skills** of the following: data analysis, statistics and algebra, data visualization, descriptive analysis (transforming data into information), being open to cooperation with domain experts, ability to work with advanced tools, ability to understand data, ability to recognize a business problem, data modelling, knowledge of basics of strategy and finance, communication with other departments and practical experience.



- What is also essential is that data scientists should have excellent knowledge of business processes, which will allow them to be involved in designing business processes through defining the data generated by these processes, as well as knowledge of IoT and machine learning, even though they may not be able to immediately apply this knowledge in a company. They should not be required to have excellent knowledge of, but they should be able to understand data engineering or database work (rather than database administration).



- Data scientists should have **excellent knowledge** of the following programming languages, technologies, cloud platforms or tools even today (i.e. as soon as they start working): SQL, visualization tools (PowerBI, Tableau, GGPlot, Plotlz, Qlik), Python and/or R, Cloud platforms (AWS, Google cloud, private cloud). Future excellent knowledge of the following will be required: Hadoop, Scala, Hive, Spark, Tensor Flow, NoSQL, NLP... SAS, SPSS. They should also know Excel because of its widespread use in companies (but they should not be experts).



- Asked which other business skills and knowledge, apart from technical skills, data scientists should possess, experts have singled out the following: strategic management, value chain, business processes (because data science is used to change business processes), basic knowledge of finance (ROI, what is a balance sheet or an income statement), as well as mastery of the so-called 'soft' skills, such as presentation skills, communication skills, etc.