Data scientists in hot demand thanks to Big Data

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Dr. Andreas Jedlitschka, Fraunhofer IESE, explains in an interview why data scientists are in such demand today. Credit: Fraunhofer IESE

Data scientist is one of the most attractive jobs of the 21st century. This impression is confirmed when you take a look at relevant online job portals. According to a study by the McKinsey Global Institute, in the USA demand exceeds supply by far – and this does not appear to be any different in Germany. But what is it that makes this job so interesting in the first place? Someone who knows this is Dr. Andreas Jedlitschka, Head of the Data Engineering Department at the Fraunhofer Institute for

Experimental Software Engineering IESE and a member of the Expert Committee on Data Science of the Personal Certification Body at the Fraunhofer Institute for Applied Information Technology FIT, Sankt Augustin.

Why do companies have such an enormous need for data specialists?

With the increasing networking among all areas all the way to digital ecosystems, the deluge of data in companies and organizations also increases exponentially. At the same time, the growing data availability and the success stories published in the press also lead to an increasing desire to use data systematically, i.e., to perform data analyses, and thus the need arises for experts who can perform these. These "data specialists" are frequently combined under the term data scientists.

What makes a data scientist in the first place?

First of all, I would like to define the term "Data Science": Data Science is about extracting knowledge from data and doing so ideally for the benefit of the company. To do so, methods and techniques from computer science, mathematics, and statistics are used. The job profile is varied and ranges from Big Data analytics and visual analytics via Big Data architecture to integration. In addition, business models must be taken into account, resp. developed, and thus must also be understood. Furthermore, you need to talk to the customer, i.e., the user of the information as the addressee, and with the domain expert.

What are the tasks that data scientists do, and which skills do they need?

Data scientists must be experts in several disciplines at the same time:

They do not only assess data, but must also understand the business contexts in companies and organizations. They must identify suitable data sources, determine and improve data quality, put together data, prepare and perform analyses, and then assess the results in terms of given criteria. If you work as a data scientist, you often bear great responsibility since far-reaching strategic decisions or even human lives may depend on the results of the data analyses – just think of systems used for diagnosis support in the medical domain or learning processes used in various areas in autonomous vehicles. This is why the underlying data and the analysis results must be continually checked in terms of plausibility, completeness, correctness, and relevance, in cooperation with domain experts. The requirements profile of a data scientist grows according to how their work is embedded in the company and includes not only technical skills, but also a number of soft skills such as ability to work in a team, strong communication skills, and creativity.

How to become a data scientist? What are the prerequisites, resp. what previous knowledge is required?

At Fraunhofer, we are offering a certified course in the context of the Big Data Alliance, where we make the participants fit for Big Data projects. The participants are often decision makers, but mainly business developers, analysts, data managers, and software developers. The prerequisite is basic knowledge of computer science and mathematics. In the beginner courses, the participants learn about the important fundamentals, processes, and best practices for dealing with large amounts of data and for the development of smart solutions with high standards on privacy and security. In the advanced courses, individual processes are studied in detail; then the focus is on being able to apply what was learned. In these courses, we teach state-of-the art knowledge in a manufacturer-neutral, practically relevant, and at the same time

theoretically sound manner.

Young scientists coming from university also benefit from your certification course. Which background is needed to get the chance to become a qualified data scientist?

Researchers who come straight from university have excellent subject knowledge, especially from their study program, such as computer science or mathematics. What the young scientists are often lacking, however, is a broad overview and the practical experience required to collaborate in Big Data projects. And this is exactly what they learn in our data scientist course. The training is designed for a wide range of applications. They learn how business developers unlock the potential of Big Data in their company, how data engineers describe and integrate data, how analysts use machine learning processes to detect patterns and trends, and how software engineers use modern databases and distributed calculation methods to develop robust and scalable Big Data systems. All this while taking into account privacy and security. The aim is to get basic knowledge in all relevant areas. Those who want can then go on to become certified data scientists.

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