

Data Modeling

Course code: GOC4605

Data is the heart of every information system. Almost every business requirement sooner or later encounters the need to store, transfer or transform data. The role of the analyst in this process is irreplaceable - he must build a bridge between the vague business understanding of concepts and the precise structure required by developers and database specialists. In this course, you will learn how to design data structures that are understandable for the business (conceptual models) and at the same time technically feasible (logical and physical models). We will show why it is dangerous to separate these worlds and how to ensure that your design remains consistent even with technological changes. The training is built on practical exercises, where we will immediately transform theory into concrete models and vocabularies.

Who is the course for - **Business and IT analysts** who need to precisely define data structures and relationships so that there are no blind spots in the assignment. - **Solution architects**, looking for ways to effectively connect business needs with technological solution design. - **Experienced developers** who are moving towards analysis and need to adopt a methodological approach to modeling independent of specific code. #### What we will teach you - Be able to distinguish between a platform-independent (CO) and a platform-dependent (HOW/WHAT) data model. - Masterfully model domain, conceptual and logical models (including relational tables). - Learn to work correctly with cardinality, data integrity and (de)normalization. - Be able to create and deliver data dictionaries in a way that all recipients (from business to IT) can truly understand. - Effectively use the Sparx Enterprise Architect tool for creating and managing these models. #### Required entry knowledge - Analytical thinking. - Basic orientation in terms such as *table* or *relation* (an advantage, not a requirement). #### Teaching methods * Teaching takes place in the form of professional explanations, which are immediately supplemented with practical examples. * The key part is individual and group exercises on computers, where participants, under the supervision of a lecturer, design specific models in a real modeling tool. #### Study materials - Presentation of the material discussed in printed or online form. #### Course outline - **Introduction to data modeling** - Basic concepts and the principle of abstraction (model, modeling, information, data). - Differences in data modeling approaches (PIM and PSM). - Using the Sparx Enterprise Architect modeling tool for data modeling. - Procedures, tips, tutorials. - **Conceptual modeling (CO level)** - Important concepts: entity, relationship. - Modeling using UML (basics of class diagram) and E-R diagrams. - Multiplicities of relationships, constraint options and other rules for data integrity. - Working with database models in Sparx EA. - **Technological models and architecture (HOW level)** - Determining technologies for different layers. - Front-ends, back-ends, middle layers. - The importance of platforms. - Technological models. - **Modeling for relational databases (WHAT level)** - Relational databases. - Database concepts: table, relationship, primary and foreign keys. - Modeling: cardinality, relationships. - Ensuring data integrity. - Model normalization and denormalization. - Transferring generalization to a relational environment. - Working with database models in Sparx EA. - Indexes.

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