Advanced Metadata and Semantic Interoperability Training Course

14 - 18 Dec 2026

Rome

5800 € (Per Person)

Ref: #DM8817_91344

Course Introduction / Overview:

This course provides a comprehensive exploration of metadata management and semantic interoperability, two critical pillars for modern data strategy and governance. In an era of exponential data growth, the ability to find, understand, trust, and integrate data is paramount. This program moves beyond basic data cataloging to address the core challenge of making data not just machine-readable, but machine-understandable. We delve into the principles and practices that enable disparate systems and datasets to communicate seamlessly, unlocking immense value and fostering true data-driven decision-making. As detailed by pioneers like Tom Heath and Christian Bizer in their seminal work, "Linked Data: Evolving the Web into a Global Data Space", the future of data lies in creating an interconnected web of knowledge. This training course, offered by BIG BEN Training Center, equips participants with the skills to build this future within their organizations. Participants will master everything from foundational metadata standards and governance frameworks to advanced topics like ontology engineering with OWL, building knowledge graphs, and querying linked data with SPARQL. The curriculum is designed to bridge the gap between theory and practice, ensuring that attendees can implement robust metadata

Target Audience / This training course is suitable for:

- Data Architects and Data Modelers.
- Information Managers and Librarians.
- IT Professionals and Systems Integrators.
- Data Governance and Data Stewardship Professionals.
- Business Intelligence and Data Warehouse Developers.
- Researchers and Data Scientists.
- Compliance and Risk Management Officers.
- Software Engineers involved in data integration.

Target Sectors and Industries:

- Financial Services and Banking.
- Healthcare and Life Sciences.
- Government Agencies and Public Sector Bodies.
- Academic and Research Institutions.
- Telecommunications and Technology.
- Retail and E-commerce.
- Manufacturing and Supply Chain Logistics.
- Energy and Utilities.

Target Organizations Departments:

- Information Technology (IT) and Data Management.
- Research and Development (R&D).
- Business Intelligence and Analytics.
- Compliance and Legal Departments.
- Enterprise Architecture.
- Digital Transformation and Innovation Offices.
- Operations and Logistics.
- Product Management and Development.

Course Offerings:

By the end of this course, the participants will have able to:

- Develop a strategic framework for enterprise metadata management.
- Differentiate between various types of metadata and their applications.
- Apply international metadata standards like Dublin Core and schema.org.
- Understand the core principles of the Semantic Web and Linked Data.
- Design and build robust ontologies and taxonomies using OWL and SKOS.
- Utilize RDF to model and represent data for interoperability.
- Write SPARQL queries to retrieve and analyze data from semantic repositories.
- Implement data governance policies for metadata quality and lineage.
- Integrate disparate data sources using semantic technologies.
- Apply FAIR data principles to enhance data findability and reusability.
- Evaluate tools and platforms for metadata and semantic layer management.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, immersive, and practical, ensuring that participants gain both theoretical knowledge and hands-on skills. We believe that learning is most effective when it is an active process. Therefore, the course blends expert-led instruction with a variety of engaging activities. Each module includes detailed presentations on core concepts, followed by interactive discussions that encourage participants to share their unique challenges and experiences. A significant portion of the training is dedicated to practical workshops and hands-on labs where participants will work with tools and technologies like RDF, OWL, and SPARQL. Real-world case studies from various industries will be analyzed in group sessions to illustrate the successful implementation of metadata management and semantic interoperability strategies. Collaborative team exercises will challenge participants to design semantic models and solve complex data integration problems, fostering teamwork and critical thinking. Continuous feedback is provided by the instructor throughout the course, and dedicated Q&A sessions ensure that all participant queries are thoroughly addressed. This blended approach guarantees a rich learning experience that is both intellectually stimulating and directly applicable to the participant's professional environment.

Course Agenda (Course Units):

Unit One: Foundations of Metadata Management

- Introduction to Metadata and its Strategic Importance.
- Types of Metadata: Technical, Business, and Operational.
- The Metadata Lifecycle: Creation, Storage, Maintenance, and Archival.
- International Metadata Standards (Dublin Core, MODS, EAD).
- Data Catalogs and Metadata Repositories.
- Principles of Data Governance and Data Stewardship.
- Establishing a Metadata Governance Framework.

Unit Two: Principles of Semantic Interoperability

- The Challenge of Data Silos and Integration.
- Introduction to the Semantic Web and Linked Data Principles.
- The Resource Description Framework (RDF) Data Model.
- Understanding URIs, Literals, and Blank Nodes.
- Serializing RDF: Turtle, RDF/XML, and JSON-LD.
- The FAIR Data Principles (Findable, Accessible, Interoperable, Reusable).
- From Data to Knowledge: The Role of Semantics.

Unit Three: Designing and Building Ontologies

- Introduction to Ontologies and Knowledge Representation.
- Taxonomies, Vocabularies, and Thesauri with SKOS.
- The Web Ontology Language (OWL): Key Concepts and Constructs.
- Building Ontologies: Classes, Properties, and Individuals.
- Understanding Logic and Reasoning in OWL.
- Common Pitfalls in Ontology Design.
- Practical Lab: Creating a Basic Ontology for a Business Domain.

Unit Four: Advanced Governance and Data Integration

- Connecting Metadata Management with Semantic Strategy.
- Data Lineage and its Importance for Trust and Compliance.
- Implementing Data Quality Rules for Metadata.
- Schema Mapping and Data Harmonization Techniques.
- Ontology-Based Data Integration (OBDI).
- Building and Populating Knowledge Graphs.
- Governing Semantic Assets and Ontologies.

Unit Five: Practical Application and Future Directions

- Introduction to SPARQL for Querying RDF Data.
- Writing Complex Queries: Filters, Aggregates, and Federation.
- Case Studies: Semantic Interoperability in Healthcare, Finance, and Research.
- Evaluating and Selecting Semantic Technologies and Tools.
- The Role of AI and Machine Learning in Metadata Automation.
- Future Trends in Semantic Technologies and Data Fabrics.
- Developing a Roadmap for Implementation in Your Organization.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

As data ecosystems become increasingly complex, is achieving perfect semantic interoperability a realistic goal or a perpetual pursuit?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by holistically integrating the strategic discipline of metadata management with the technical practice of semantic interoperability. While many courses focus on one area or the other, this program builds a crucial bridge between them, teaching participants not just how to use semantic technologies like OWL and SPARQL, but why and when to apply them within a robust data governance framework. We move beyond tool-specific training, which can quickly become outdated, and instead focus on the enduring principles of data modeling, ontology design, and knowledge representation. The curriculum is built around a series of practical, real-world case studies that challenge participants to solve complex data integration problems, rather than simply completing rote exercises. This emphasis on critical thinking and strategic application ensures that graduates can return to their organizations and not only build a data catalog or an ontology but also champion and lead a culture of data-centricity. The course provides a unique blend of architectural theory and hands-on engineering, making it equally valuable for data architects planning enterprise strategy and developers tasked with implementing it. It prepares professionals to build data ecosystems that are not just connected, but truly intelligent and future-proof.