

# The Journey of RDF

From a Web of Documents to a Web of Data

Discovering how a simple idea is connecting the world's knowledge

# The Challenge: Data Silos

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The early web connected documents brilliantly, but valuable data remained trapped

## Database A

Proprietary Schema

Locked & Isolated



## No Integration

Complex ETL

Manual Mapping

## Database B

Different Schema

Incompatible Format

# The Breakthrough: RDF Triple

A deceptively simple approach: describe everything using three-part statements



Using global standardized web identifiers (hyperlinks), these statements link together to form a single, interconnected graph of knowledge

# The Evolution: Early Milestones

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**1999**

## **The Foundation**

W3C publishes first RDF specification for Semantic Web

**2006**

## **Linked Data Principles**

Tim Berners-Lee defines four principles for web data

# Recent Evolution

2008

## **SPARQL 1.0**

Query language for Web of Data

2017

## **SHACL Standard**

Validation framework for RDF

Today

## **Global Adoption**

Powers knowledge graphs & AI

# Why RDF Changes Everything

## Unambiguous Identity

Hyperlinks eliminate ambiguity about what's named

## Seamless Integration

Merge datasets instantly without complex ETL pipelines

## Infinite Flexibility

Evolve data models dynamically without breaking systems

## Powerful Queries

SPARQL enables intricate analysis across datasets

# Ensuring Data Quality

RDF's flexibility requires validation frameworks for enterprise reliability

## Shape Expressions (ShEx)

Intuitive language for defining data structures and constraints

## SHACL

W3C Recommendation for validating RDF graphs in enterprise systems

# Transforming Industries



## Google Knowledge Graph

Powers search result info boxes with entity relationships



## Schema.org

Structured markup on billions of web pages



## Life Sciences

Bio2RDF and UniProt accelerate drug discovery



# More Applications



## Cultural Heritage

Museums create  
interconnected digital  
collections



## Open Government

Transparent data publication  
and integration



## LOD Cloud

Thousands of datasets  
creating global knowledge  
network

# Key Takeaways

## **Simple Yet Powerful – Deceptively Simple**

Triples provide universally extensible structured data representation

## **Global Integration**

Hyperlinks enable seamless data merging without complex ETL

# Thank You

Learn more about RDF and the Semantic Web

Visit: [www.w3.org/RDF](http://www.w3.org/RDF)

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Building the Web of Data, One Triple at a Time