Resource Description Framework (RDF)

Sudan University of Science and Technology

Prepared By:

Hozifa Adam

E-mail: hozifa.adam@gmail.com

Topics:

- Concepts.
- RDF Model.
- RDF Syntax.
- RDF Schema.

RDF Introduction(1):

- **Metadata:**

  - Data about data or Information about information.

  -Machine-understandable(Machine readable : data).

  - Resource Discovery.

  - Sites-maps.

  - About relationship – about descriptions of resources.

RDF Introduction(2):

- **Metadata:**

  - Used by clients (web browsers) to improve discovery and access of distributed information.

  - Usually imbedded into HTML to tell the browser what information is contained in the page.

  - In the context of RDF, metadata is "data describing web resources".

RDF Introduction(3):

- Metadata Scenario:

  - The library (Book's title , Author's name … library catalog).

  - The video shop (movie name , movie director name …)

  - The phone book

RDF Introduction(4):

- **RDF** (Resource Description Framework)

  - Designed By Tim-Berners-Lee, the inventor of the Web.

  - **RDF** is foundation for processing metadata.

  - **RDF** is about metadata for Web resources, by resources we mean any object that can be found on the Web.

RDF Introduction(5):

- **RDF** is a means for developing tools and applications using a common syntax for describing Web resources.
- **RDF** provides a data model that supports fast integration of data sources by bridging semantic differences.
- **RDF** is XML-based serialization syntax.
- **RDF** resembles ER-diagram.

RDF Definition:

- The **R**esource **D**escription **F**ramework (**RDF**) is a W3C standard for describing resources on the Web.
- RDF is a framework for describing Web resources,

  - e.g., title, author, modification date, content, and copyright information of a Web page.

What (else) is RDF?:

- **RDF** provides a model for data, and a syntax so that independent parties can exchange and use it.
- **RDF** is designed to be read and understood by computers.
- **RDF** is not designed for being displayed to people.
- **RDF** (can be) written in XML.
- **RDF** is a part of the W3C's Semantic Web Activity.

RDF Usage Examples:

- Describing properties for shopping items, such as price and availability.
- Describing time schedules for web events
- Describing content and rating for web pictures.
- Describing content for search engines.

RDF is Designed to be Read by Computers:

- **RDF** was designed to provide a common way to describe information so it can be read and understood by computer applications.
- **RDF** descriptions are not designed to be displayed on the web.

RDF can be Written in XML:

- **RDF** documents can be written in XML. XML language : **RDF/XML**.
- information exchange between:

  - different types of computers

  - using different types of operating systems and

  - and application languages.

RDF and The Semantic Web:

- The **RDF** language is a part of the W3C's Semantic Web Activity. W3C's "**Semantic Web Vision**" is a future where:

- Web information has exact meaning
- Web information can be understood and processed by computers
- Computers can integrate information from the web

RDF Features:

- Resource Description Framework, as its name implies, is a framework for describing and interchanging metadata. It is built on the following rules.

1. A Resource is anything that can have a URI; this includes all the Web's pages, as well as individual elements of an XML document.

RDF Features:

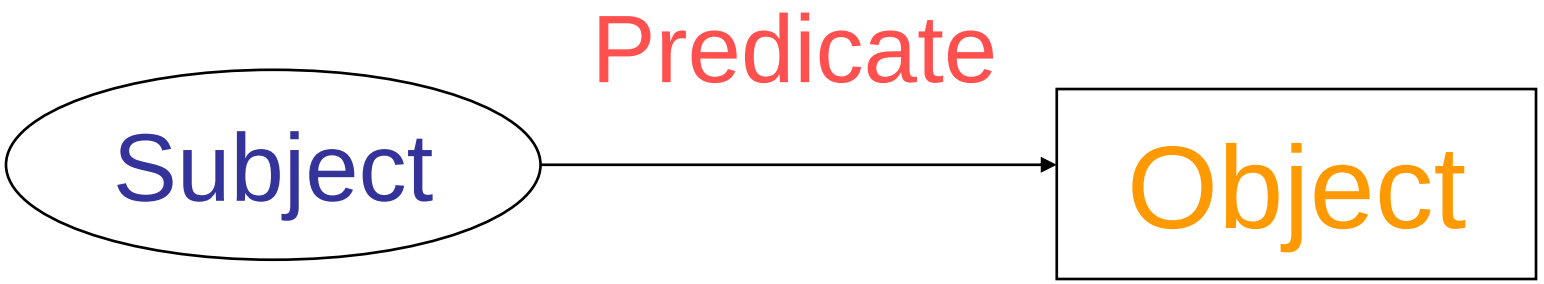
2. A Property is a Resource that has a name and can be used as a property, for example Author or Title.
3. A Statement consists of the combination of a Resource, a Property, and a value. These parts are known as the 'subject', 'predicate' and 'object' of a Statement.

RDF Data Model

RDF Statements:

- RDF is built of **Statement**s
- known as the
  - **subject.**
  - **predicate.**
  - **object** .

RDF Statements:



The key elements of an RDF:

- **Subject**: In grammar, this is the noun or noun phrase that is the doer of the action.

  In the sentence “The company sells batteries,” the subject is “ the company”.

  In logic, this is the term about which something is asserted. In RDF, this is the resource that is being described by the ensuing predicate and object.

- **Predicate**: In grammar, this is the part of a sentence that modifies the subject and includes the verb phrase. Returning to our sentence “The company sells batteries,” the predicate is the phrase “sells batteries.” In other words, the predicate tells us something about the subject.

In logic, a predicate is a function from individuals (a particular type of subject) to truth-values with an arity based on the number of arguments it has. In RDF, a predicate is a relation between the subject and the object.

- **Object:** In grammar this is a noun that is acted upon by the verb. Returning to our sentence “The company sells batteries,” the object is the noun “batteries.” In logic, an object is acted upon by the predicate. In RDF, an object is either a resource referred to by the predicate or a literal value.

Examples:

- Let's look at some example statements to get a better understanding:

  - Statement: "The author of http://www.w3schools.com/RDF is Jan Egil Refsnes".

  - Statement: "The homepage of http://www.w3schools.com/RDF is http://www.w3schools.com".

Examples – *cont.*

- Statement: "**The author of http://www.w3schools.com/RDF is Jan Egil Refsnes**".

  - The subject of the statement above is: **http://www.w3schools.com/RDF**

  - The predicate is: **author**

  - The object is: **Jan Egil Refsnes**

Examples – *cont.*

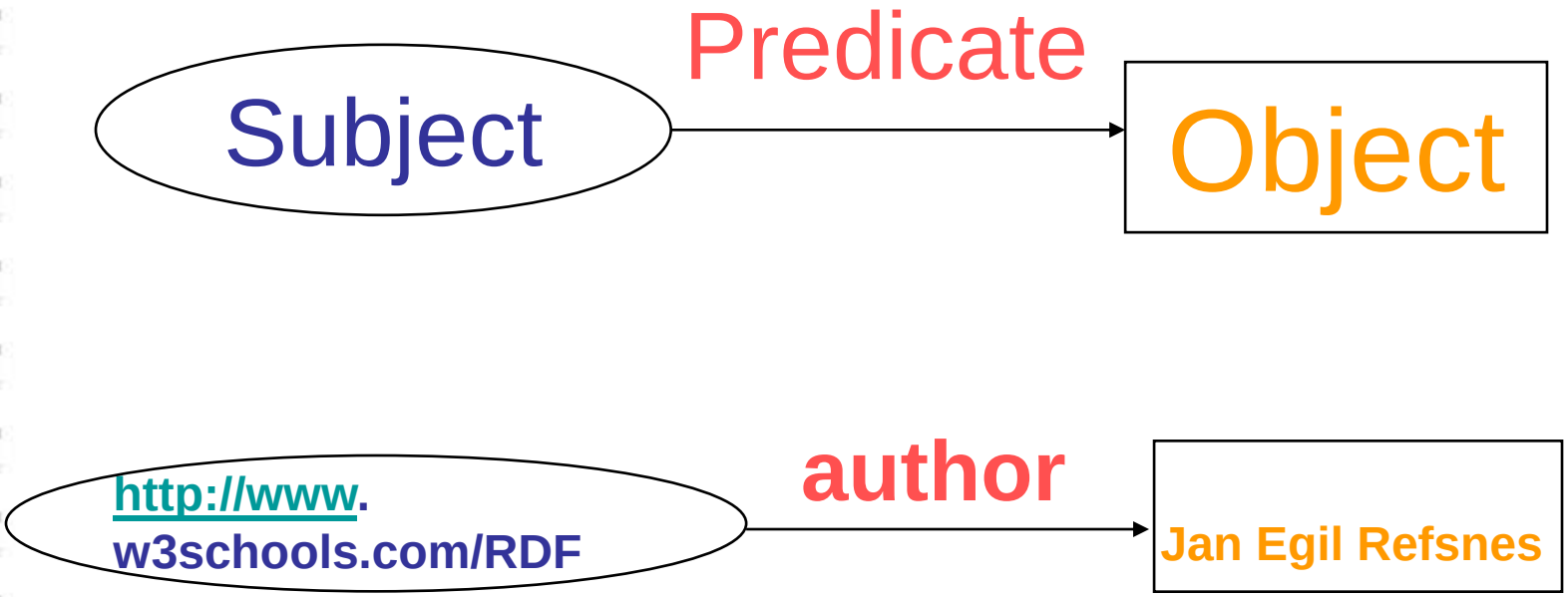
- Statement: "**The homepage of http://www.w3schools.com/RDF is http://www.w3schools.com**".

  - The subject of the statement above is: **http://www.w3schools.com/RDF**

  - The predicate is: **homepage**

  - The object is: **http://www.w3schools.com**

Examples – *cont.*



RDF Resource, Property, and Property Value:

- RDF identifies things using Web identifiers (URLs), and
- describes resources with properties and property values.
- A **Resource** is anything that can have a URL,

  - such as "http://www.w3schools.com/RDF"

RDF Resource, Property, and Property Value:

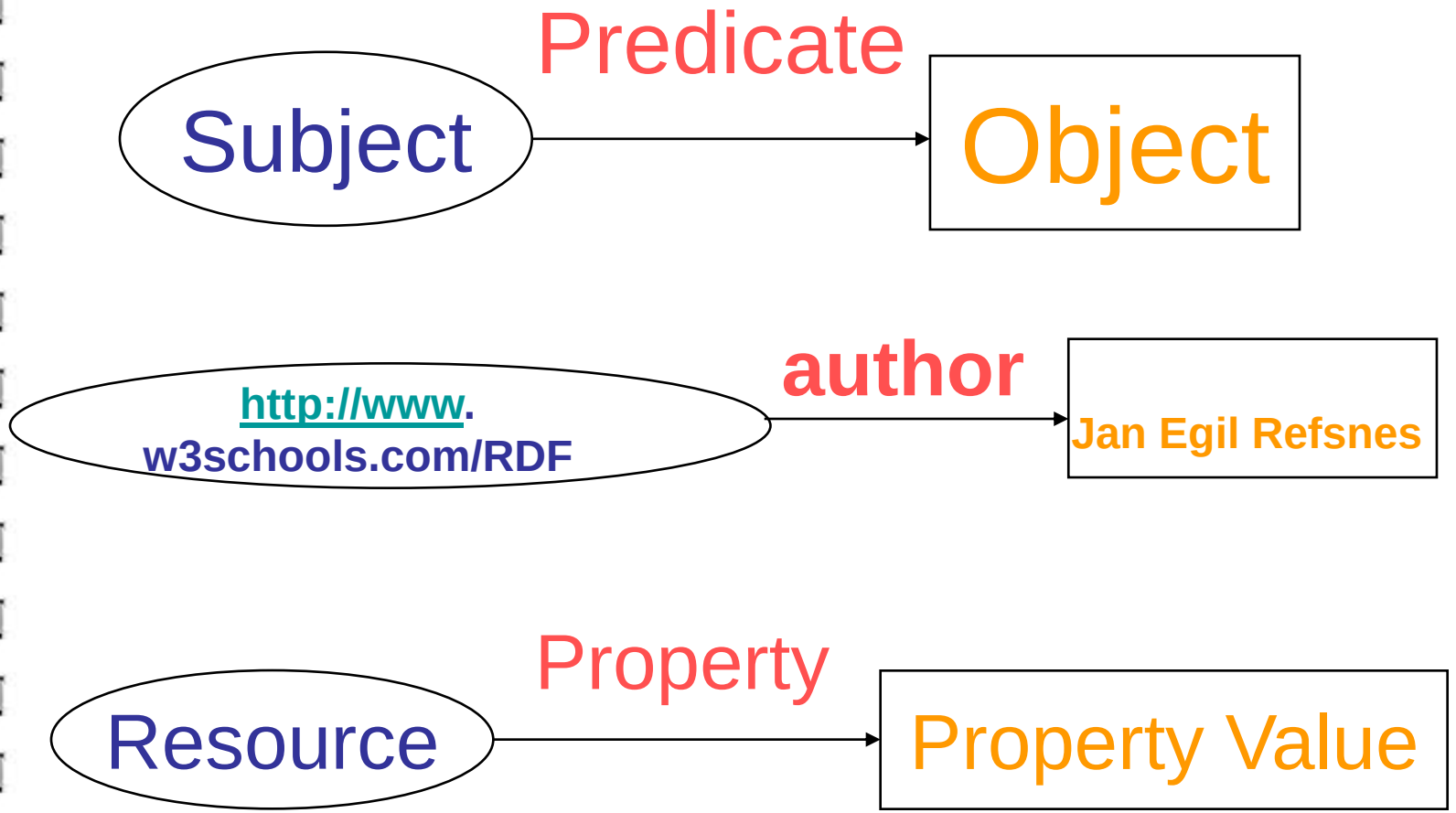
- A **Property** is a Resource that has a name,

  - such as "author" or "homepage"

- A **Property value** is the value of a Property,

  - such as "Jan Egil Refsnes" or "http://www.w3schools.com" (note that a property value can be another resource)

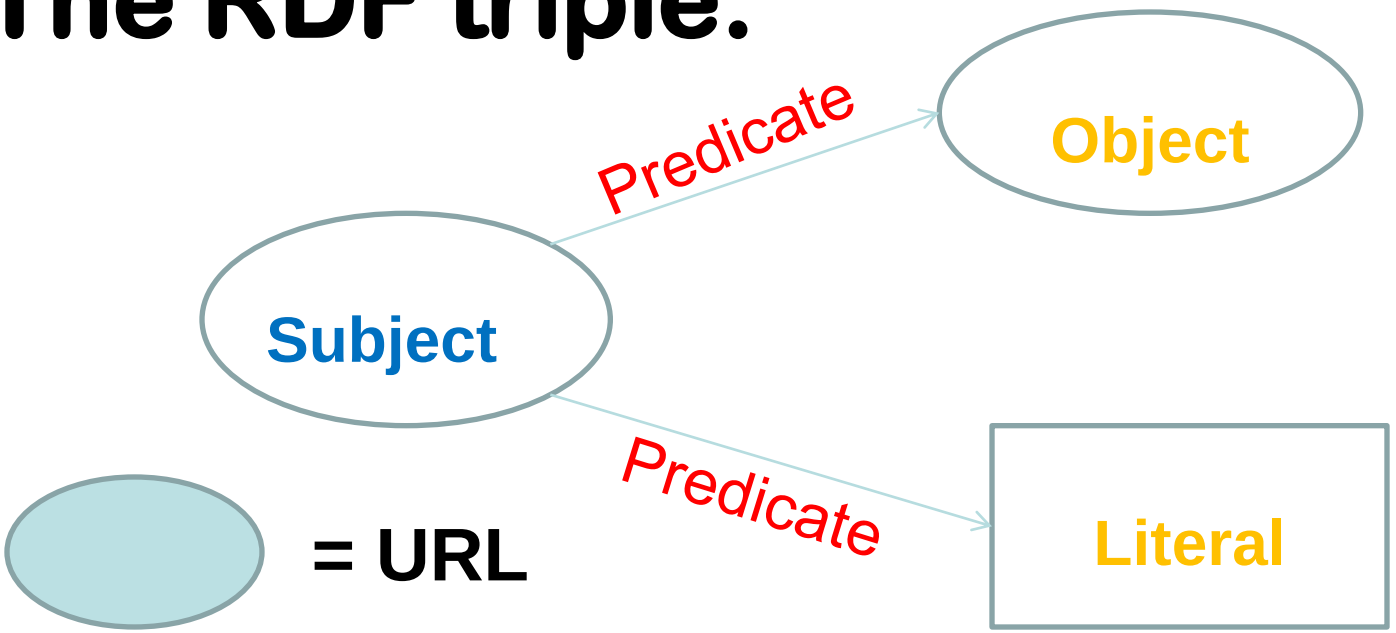
RDF Statements:



The RDF triple:

- Triples (instead of pairs).
- The RDF model is often called a "triple" because it has three parts.

The RDF triple:



= URL

= Literal

= Property or Association

So, RDF ..

- This is the concept … how to implement it?
- We will continuous in next presentation (RDF Syntax) and (RDF schema).


Thank You
For Attention

References:

- Dr. Alexandra I. Cristea:

http://www.dcs.warwick.ac.uk/~acristea/

- By David Wilczynski, USC, dwilczyn@usc.edu

  Based on: http://www.w3.org/TR/rdf-primer/

- The Semantic Web :A Guide to the Future of XML, Web Services, and Knowledge Management:

  - Michael C. Daconta
  - Leo J. Obrst
  - Kevin T. Smith