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XML Schema & modellering

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[V 0.3]

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XML Schema - idea

Document [generic] property:
- [any sequence of characters]
- [mix of tags & text]
- Well-formed
- Valid
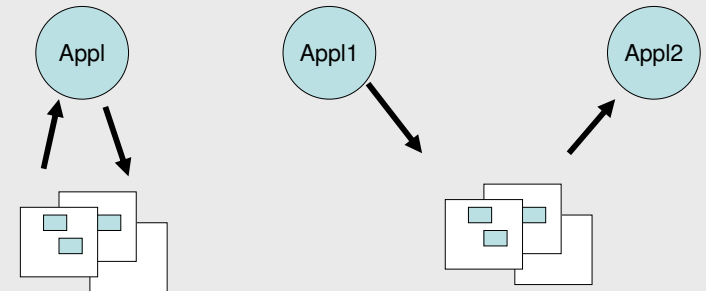- [syntactically constrained]
- [semantically constrained]
- ..... etc.....

Document type name
- "Document"
- "Markup document"
- "XML document"
- "XML w.r.t. Schema"
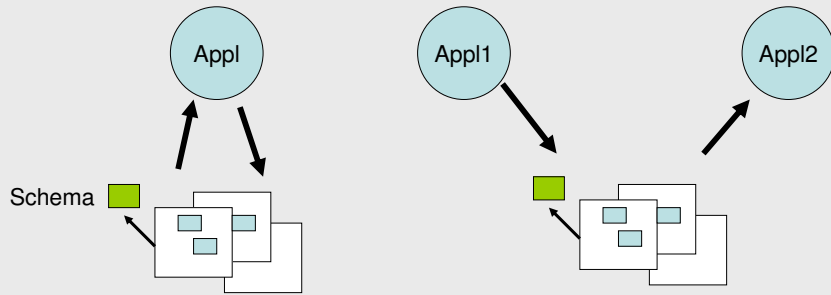- ?
- ?

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XML Schema - context

- Tied to XML:
  - Schemas define constraints **on XML documents**
  - Schema definition language **is an XML language**
- Defined by World Wide Web Consortium (W3C)
- Part of the family of XML technologies

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Data

Appl

Appl1

Appl2

Self-descriptive data

Schema

Appl   Appl1   Appl2

Descriptive data
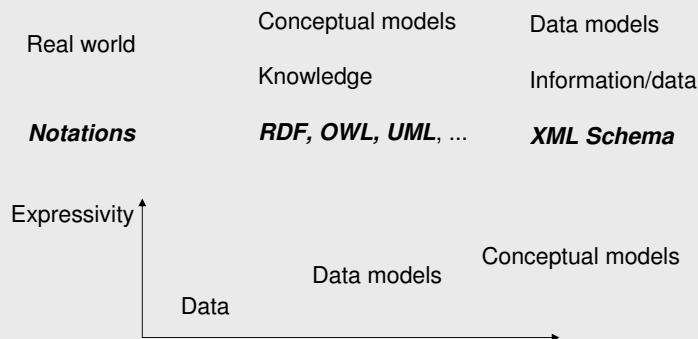
Descriptive data supports
- Practical evolution – traceability (dependencies)
- Dynamic access – detect structure

What XML Schema supports
- Schemadriven access (persistence)
- Schemadriven communication (interoperability)
- Distribution
- Decentralisation

Schemas and models

- Models of data vs models of real world

	Conceptual models	Data models
Real world	Knowledge	Information/data
Notations	*RDF, OWL, UML*, ...	*XML Schema*

Expressivity

Conceptual models

Data models

Data

Where to in modelling

- Richer expressiveness
- Stronger semantics
- Interoperability with other standards
- Layering for expressivity
- Relations to processing/inference capability

→
- Towards the semantic web

Schema use

Schema use:
- Validation (of data)
- Discovery (of data types)

Enhances...
- Robustness
- Adaptivity
- Quality (bridge gap between data and software)

Bridging the gap

Mismatch between schema expressibility and programming language type systems
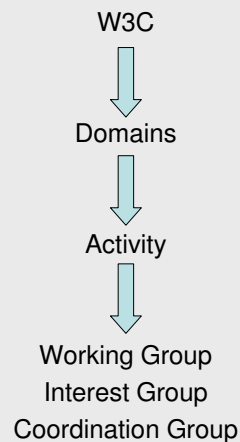
Approaches to handle the mismatch
- Schema centric
  - Define all types in XML Schema → map to program types
- Program type centric
  - Define all types as pargram types → map to XML Schema

Trade-offs.... Contextdependent
  - private date → ...
  - interoperability
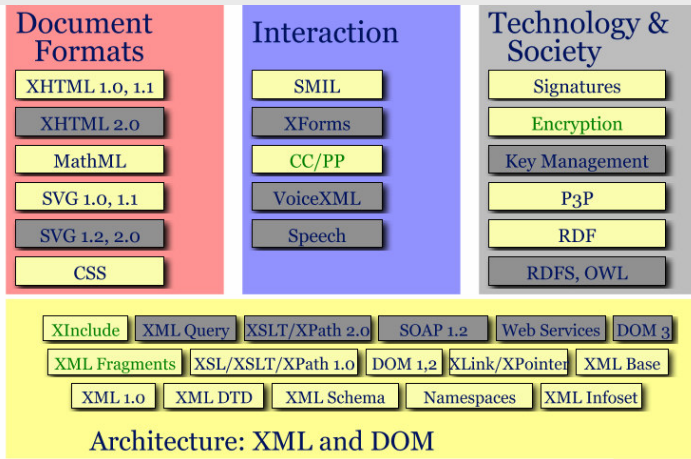

XML Schema – from where

- W3C
  - Architecture Domain
    - XML Activity
      - XML Query Working Group
        » .....
      - XML Schema Working Group
        » XML Schema
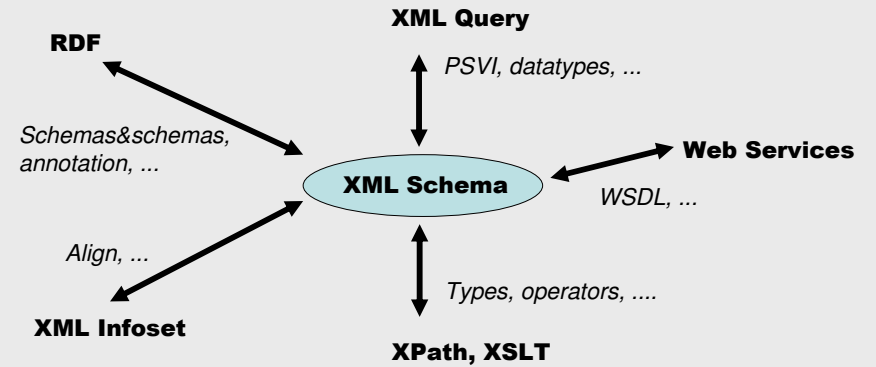   » 1.0
        » 1.1
        » 2.0

W3C
↓
Domains
↓
Activity
↓
Working Group
Interest Group
Coordination Group

W3C specs timeline

1996	1997	1998	1999	2000	2001	2002	2003	2004
PNG	PICSRules	XML 1.0	CSS 1	ATAG 1.0	MathML 2.0	XML Signature	SVG 1.1	CC/PP
PICS 1.1		MathML 1.0	Namespaces	XML 1.0	Canonical XML	P3P 1.0	SVG Mobile	DOM 3
CSS1		CSS 2	WebCGM	DOM 2	XML Schemas	XML Canonicalizatio	XPointer	Infoset (2nd)
		SMIL 1.0	RDF (Old Version)	(X)HTML	Ruby	XPath Filter	SOAP 1.2	Namespaces 1.1
		DOM 1	WCAG 1.0		XLink 1.0	Decrypt Transform	XForms 1.0	XML 1.0 (3rd)
			Style Sheets PI		XML Base	XML Encription	XML Events	XML 1.1
			MathML 1.01		SMIL 2.0	UAAG1.0	MathML 2.0	OWL
			XPath 1.0		SMIL Animation		PNG (2nd)	RDF
			XSLT 1.0		SVG 1.0			Speech Recognition
					XSL 1.0			VoiceXML 2.0
					Infoset			
					WebCGM			

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XML family and friends

Document Formats
- XHTML 1.0, 1.1
- XHTML 2.0
- MathML
- SVG 1.0, 1.1
- SVG 1.2, 2.0
- CSS

Interaction
- SMIL
- XForms
- CC/PP
- VoiceXML
- Speech

Technology & Society
- Signatures
- Encryption
- Key Management
- P3P
- RDF
- RDFS, OWL

XInclude | XML Query | XSLT/XPath 2.0 | SOAP 1.2 | Web Services | DOM 3
XML Fragments | XSL/XSLT/XPath 1.0 | DOM 1,2 | XLink/XPointer | XML Base
XML 1.0 | XML DTD | XML Schema | Namespaces | XML Infoset

Architecture: XML and DOM

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XML Schema and friends

Need to harmonise set of technologies, e.g.:

- **RDF** — *Schemas&schemas, annotation, ...*
- **XML Query** — *PSVI, datatypes, ...*
- **Web Services** — *WSDL, ...*
- **XML Schema**
- *Align, ...* — **XML Infoset**
- *Types, operators, ...* — **XPath, XSLT**

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XML Schema versions

- XML Schema 1.0
- XML Schema 1.0: 2nd edition
  - Typographical corrections etc
- XML Schema 1.1
  - Correct errors, modest improvements.
  - Aligning w. XML Query 1.0, XPath 2.0, XSLT 2.0
  - Support for versioning ?
  - Extensions to data types ?
- XML Schema 2.0
  - Requirements and use cases

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XML Schema timeline

	Jan 2004 Feb Mar Apr May	Jun	Jul Aug Sep	Oct Nov Dec	Jan 2005 Feb Mar	Apr May	Jun Jul Aug	Sep Oct Nov	dec
Schema									
- 1.1 reqs	revised								
- 1.1		WD1	WD	WD	CR		PR	Rec	
- Comp. Design.	WD		WD	CR	PR	Rec			
- Formal Descr.			WD	WD	WD		CR	PR	Rec
- 2.0 Reqs						WD			