

Need of XML (What is XML?)

- Solution for data Exchange between Database Management System (DBMS)

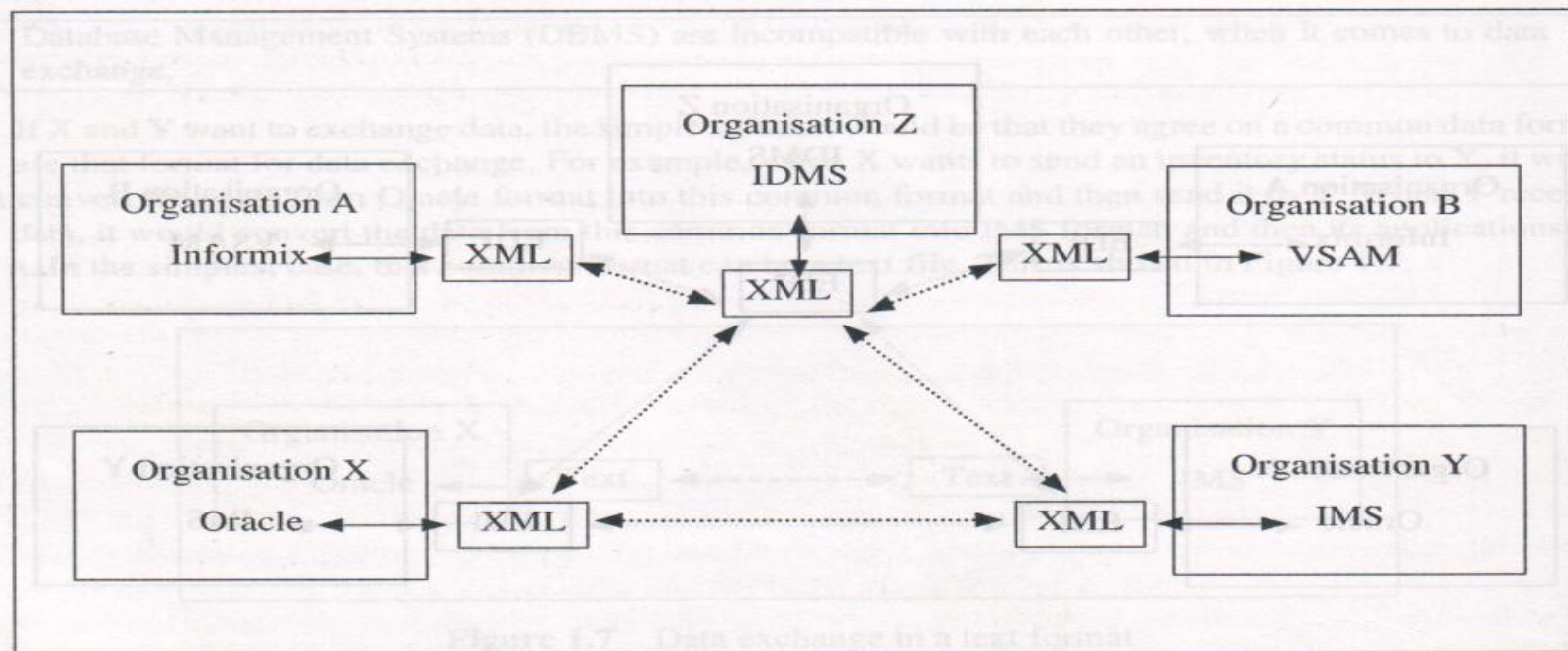


Figure 1.9 XML as the data exchange standard

Data Exchange using XML

UNIT - 1 XML

XML Versus HTML

HTML

- HTML defines a set of tags describing how the web browser should display the content of a document.
- HTML is an information presentation language.
- HTML focuses on display of DATA

XML

- XML used tag to organise documents and the contents there in.
- XML is an information description language
- XML focuses on representation of DATA

XML Versus HTML

HTML

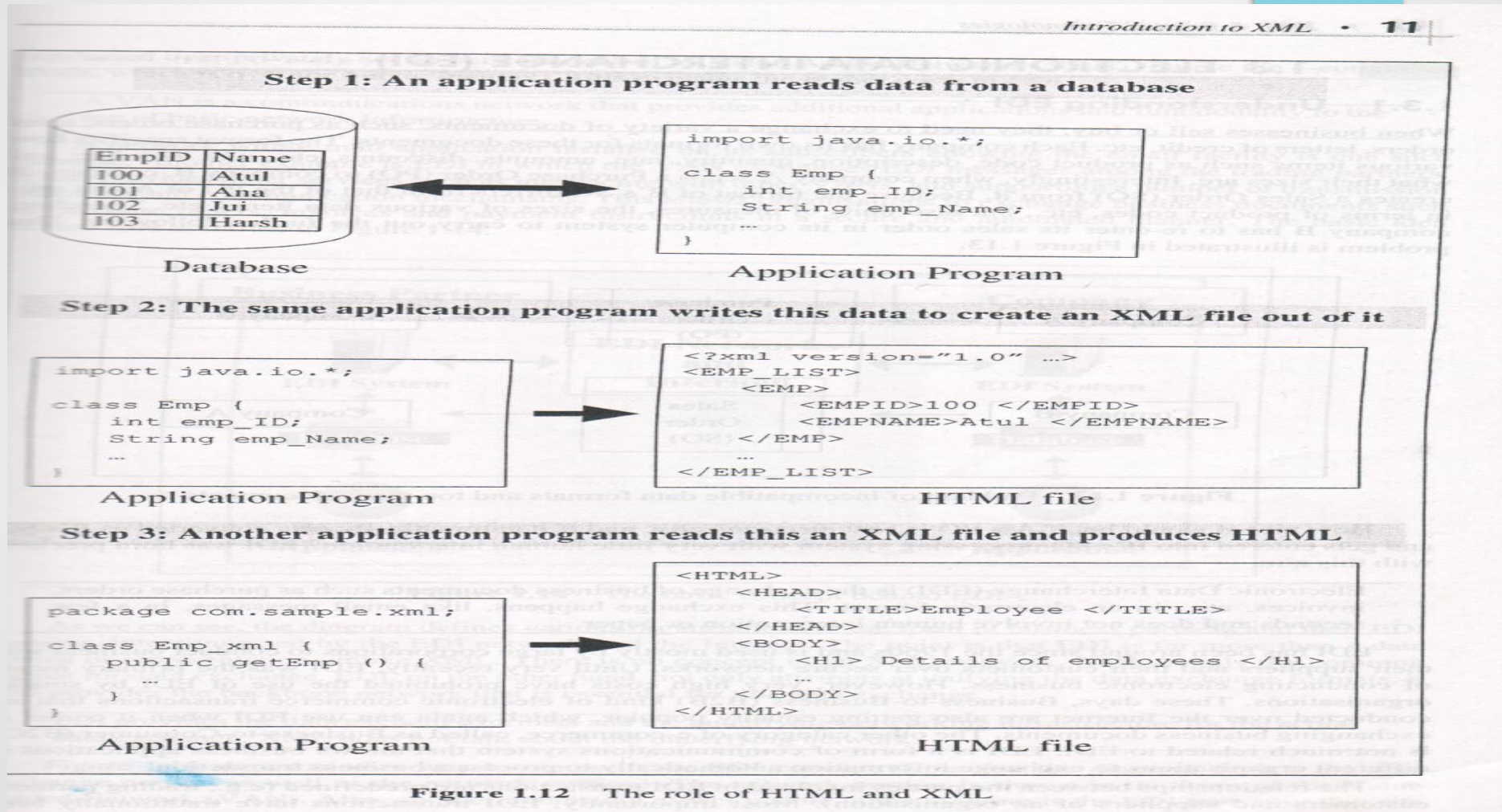
- HTML can not process, sort, encrypting data.
- HTML format would convey nothing about meaning of the data.

XML

- XML can process, sort, encrypting data.
- XML describes the meaning of the data.

XML Versus HTML

The Role of HTML and XML



XML Terminology

- Every XML file has an extension of .xml
- Demo 1: Book.xml

XML Terminology

Terminology in XML

Figure 1.23 shows a short pictorial explanation of this XML document. A detailed explanation is provided in Table 1.1.

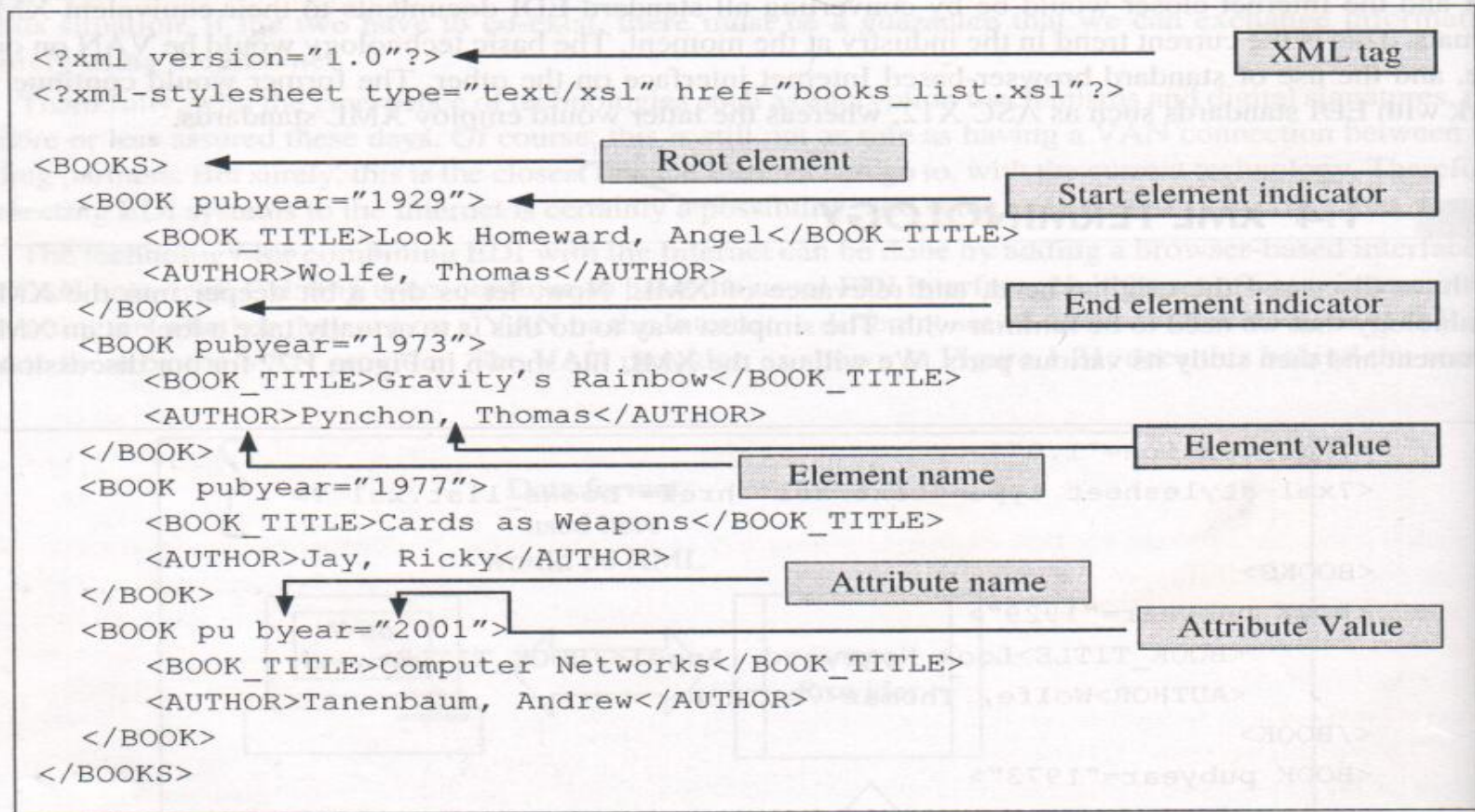


Figure 1.23 Terminology in XML High level overview

XML Terminology

Contentsof the XML File	Description
<?xml version="1.0" encoding="UTF-8"?>	This line identifies that files is an XML document. Every XML document must begin with this line.
<BOOKS>	This line implicitly indicates the start of the actual contents in the XML file.
<BOOK Pubyear='1973'>	Pubyear='1973' is called as an attribute in XML. An Attribute serves the purpose of providing more information about an element.
<BOOK_TITLE>	This is another element declaration. Information in a hierachical manner comes into picture.
</BOOK>	This declaration indicates the end of the first <BOOK> element.

XML Terminology

Terminology in XML

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Exercise 3: Suppose we want to store information regarding employees in the following format in XML. Show such a file with one example:

Employee ID	Numeric	5 positions
Employee Name	Alphanumeric	30 positions
Employee Department	Alphanumeric	2 positions
Role	Alphanumeric	20 positions
Manager	Alphanumeric	30 positions

Solution 3:

```
<?xml version="1.0"?>
```


XML Terminology

- **EXAMPLE**

- Suppose we want to store information regarding employees in the following format in XML. Show such a file with example

Employee Id	Numeric
Employee Name	Alphanumeric
Employee Department	Alphanumeric
Role	Alphanumeric
Manager	Alphanumeric

- Demo – 3 Employee.XML

XML STANDARDS

- The World Wide Consortium (W3C) has developed a number of standards for XML.
- Standards are :
 - XML
 - XML Namespaces
 - Document Type Definitions (DTD)
 - Cascading Style Sheets (CSS)
 - Extensible Stylesheet Language (XSL)
 - XML Schemas

XML STANDARDS

- Standards are :
 - XML Query Language (Xquery)
 - XLink
 - Xpointer
 - XPath
 - XML Digital Signatures
 - XHTML

XML STANDARDS - XML

- The first version of XML Standard was 1.0 finalised in feb, 1998.
- Which are as follow:
 - XML shall be **easily implemented** on the Internet
 - XML shall be **usable in a wide variety of applications**
 - XML shall **comply with SGML** (Standard Generalized Marked up Language)
 - XML documents **shall be readable to humans**
 - XML document **design shall be formal and compact**
 - XML document **design shall be done quickly**
 - XML documents shall be easy to create
 - XML markup is not required to be abrupt

XML STANDARDS –

- **XML Namespaces**

- To avoid confusing situation in terms of tags duplications, Namespace help us resolve conflict.

- **Document Type Definitions (DTD)**

- A DTD file allows us to specify the rules associated with an XML file.

XML STANDARDS - XMLNamespaces

- The XML Namespace allowing the users of XML to associate certain tags with their own identifiers.
- User A creating <book> tag in Book1.xml
- User B creating <book> tag in Book2.xml
- If Book1.xml and Book2.xml going to merge this would be an ambiguity.

XML STANDARDS –

- Document Type Definitions (DTD)

A Document Type Definition (DTD) file allows us to specify the rules associated with an XML file. Figure 1.25 shows the idea.

```
<?xml version="1.0"?>
<BOOKS>
  <BOOK>
    ...
  ...
</BOOKS>
```

The XML document contains the actual data, as usual. The file has an extension of .xml.

```
<!ELEMENT BOOKS (BOOK)>
<!ELEMENT BOOK
  (BOOK_TITLE, AUTHOR)>
...
```

The DTD document contains the rules about the above XML document. The file has an extension of .dtd.

Figure 1.25 Concept of Document Type Definitions (DTD)

XML STANDARDS –

- Document Type Definitions (DTD)

various elements of an XML document. For example, it can help us in checking that `<BOOK_TITLE>` is a sub-element of the `BOOK` element, but that the reverse is not possible. This is shown in Figure 1.26.

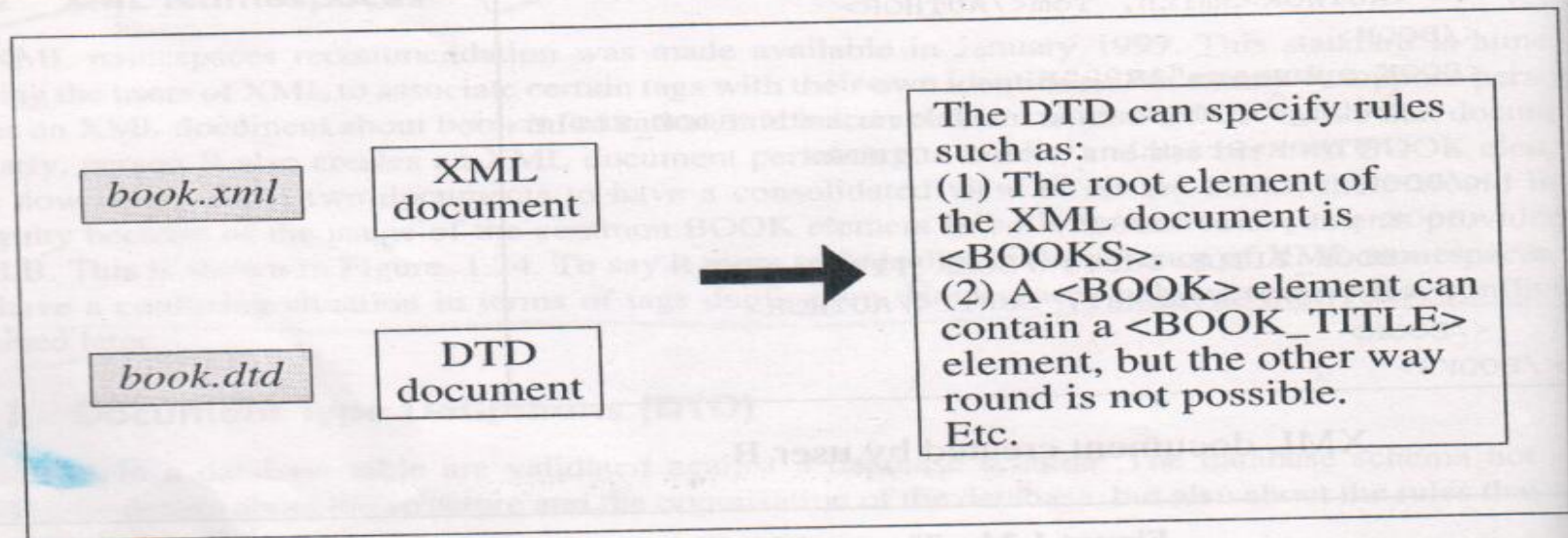


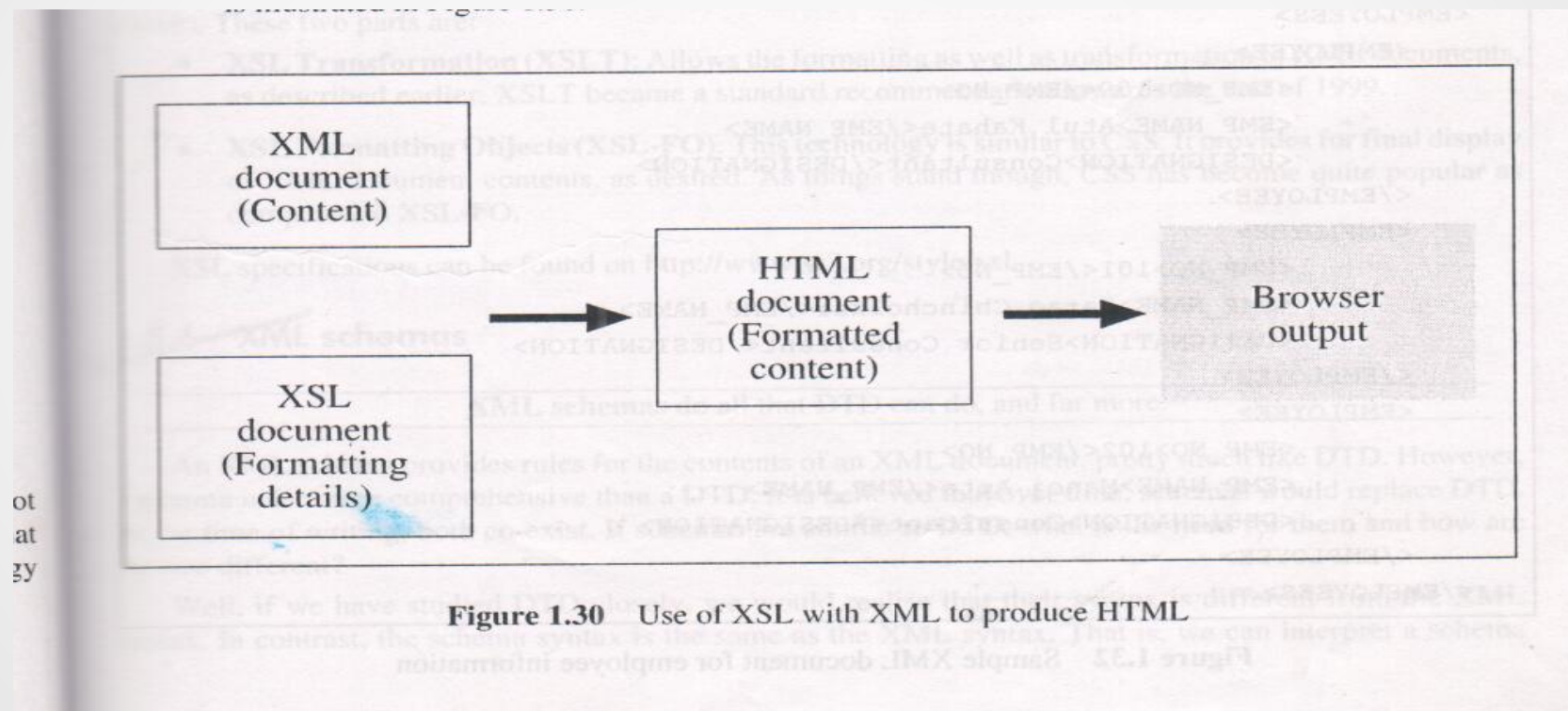
Figure 1.26 DTD concept illustrated further

XML STANDARDS –

- **Cascading Style Sheets (CSS)**
 - The **Cascading Styling Sheets technology allows the formatting of HTML documents** in a standard uniform manner.
- **Extensible Stylesheet Language (XSL)**
 - The Extensible Stylesheet Language standard provides means for formatting and **transforming XML documents in the desired manner.**
 - XSL technology consists of two parts.
 - XSL Transformation (XSLT)
 - XSL Formatting Objects (XSL - FO)

XML STANDARDS –

- **Extensible Stylesheet Language (XSL)**



XML STANDARDS –

- **Extensible Stylesheet Language (XSL)**

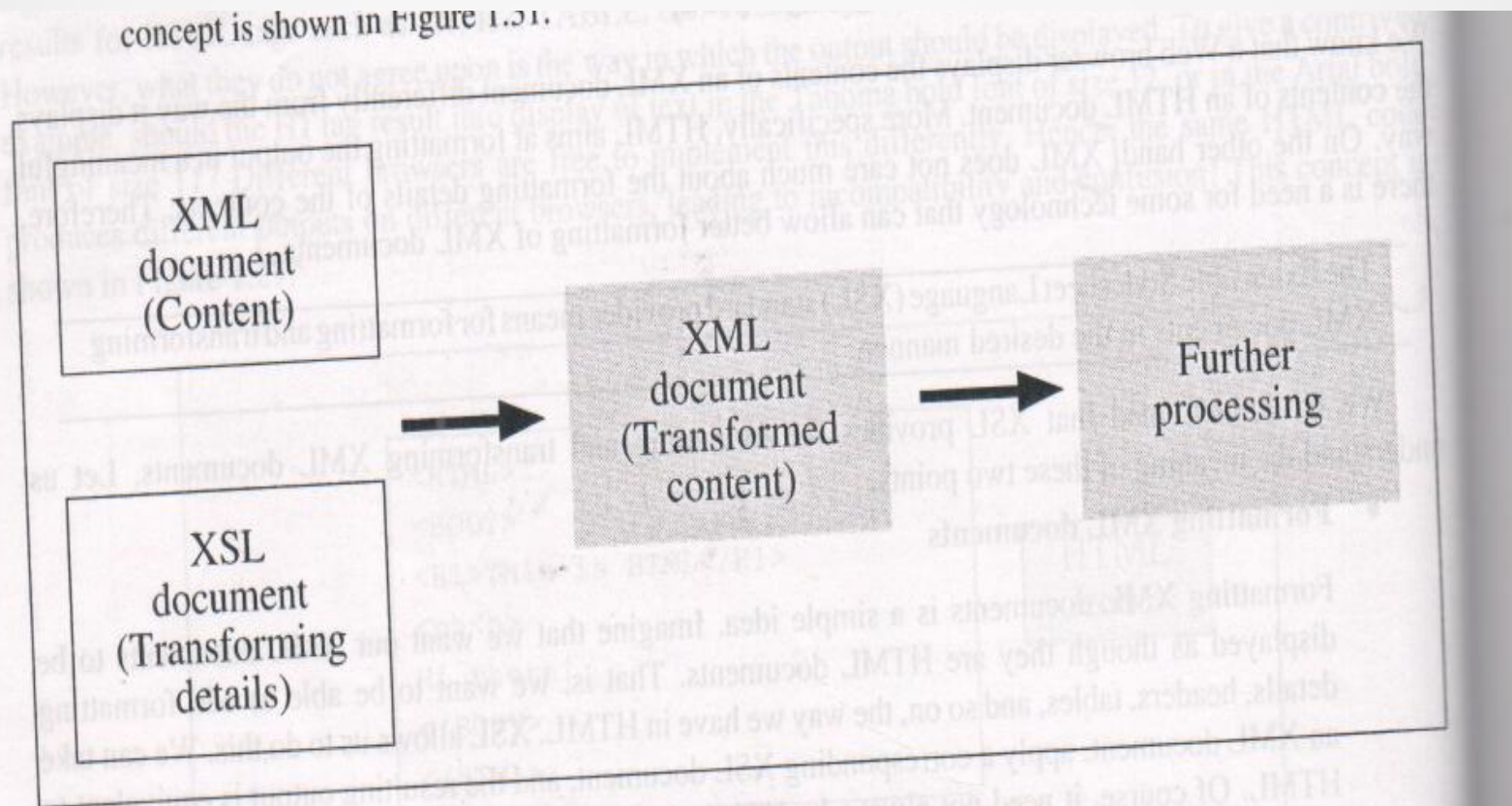


Figure 1.31 Use of XSL to transform XML

XML STANDARDS –

- **XML Schemas**

- An XML schema provides rules for the contents of an XML document, pretty much like DTD.
- It is far more than DTD.

- **XML Query Language (Xquery)**

- The XML query language, also called as Xquery, is still being developed.
- Xquery specifications can be found on
- [http:// www.w3.org/tr/xmlquery-req/](http://www.w3.org/tr/xmlquery-req/).

XML STANDARDS –

- **Xlink**

- Xlink defines a standard mechanism for **creating hyperlinks** in XML documents.
 - Xlink is a language for creating hyperlinks in XML doc.
 - Xlink is similar to HTML links.
 - Any elements in an XML document can behave as an Xlink
 - Xlink supports two types of links
 - Simple link
 - Extended links

XML STANDARDS –

- **Xpointer**
 - Xpointer allows the **hyperlinks to point to more specific parts in the XML** documents.
- **Xpath**
 - Xpath is used **to refer to specific portions of an XML document using XSLT and Xpointer.**
- **XML Digital Signatures**
 - XML digital signature **provide a means of message integrity** and non- repudiation for XML documents.
 -

XML STANDARDS –

- **XHTML**
 - It is a revised version of HTML with rules from XML.

The Idea of Markup

- In XML, tag containing values. These tags specify certain rules.
- Therefore, we can say that **XML is nothing but a set of rules.**
- XML has been written in such a manner that it can be extended easily, depending on the business domain, particular sets of requirements or technology.

The Idea of Markup

- XML is based on yet another language, called as Standard Generalised Markup Language (SGML).
- SGML is the parent of almost all important modern markup languages.

Standard Generalised Markup Language (SGML)

```
graph TD; SGML[Standard Generalised Markup Language (SGML)] --- HTML[Hyper Text Markup Language (HTML)]; SGML --- XML[Extensible Markup Language (XML)];
```

Hyper Text Markup Language (HTML)

Extensible Markup Language (XML)