A.1.7   Tree Model of XML Documents

It is possible to represent well-formed XML documents as trees; thus trees provide a formal data model for XML. This representation is often instructive. As an example, consider the following document:

```
<?xml version="1.0" encoding="UTF-16"?>
<!DOCTYPE email SYSTEM "email.dtd">
<email>
   <head>
      <from   name="Michael Maher"
              address="michaelmaher@cs.gu.edu.au"/>
      <to      name="Grigoris Antoniou"
              address="grigoris@cs.unibremen.de"/>
      <subject>Where is your draft?</subject>
   </head>
   <body>
   Grigoris, where is the draft of the paper
   you promised me last week?
   </body>
</email>
```

Figure A.1 shows the tree representation of this XML document. It is an ordered, labeled tree:

- There is exactly one root.

- There are no cycles.

- Each node, other than the root, has exactly one parent.

- Each node has a label.

- The order of elements is important.