DTDs for Publishing

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE procedure SYSTEM "ex_4.8.dtd">
<procedure>
  <title>CNC Router Lubrication</title>
  <author>Don Wallace</author>
  <department>Research and Development</department>
  <revisionDate>2006-04-01</revisionDate>
  <abstract>
      The Larken 2424 CNC Router is a high-speed computer-controlled
      woodworking tool.  It was purchased new in 2004 and was fully
      lubricated when purchased.  The need for further lubrication
      depends on the number of hours of use as well as the elapsed
      calendar time.  With heavy usage, the machine should be
      lubricated every 9 months (lubrication interval should always
      be less than 18 months).

      Each of the three screw drives should be lubricated with a dry
      Teflon spray. Do not use any wet lubricants, as they will
      attract dust and cause fouling.  Before applying the lubricant,
      remove dust from screw mechanisms using compressed air
```

```
      and a clean brush.
  </abstract>
</procedure>
```

```
<!ELEMENT procedure (
    title,
    author,
    department,
    revisionDate,
    abstract
)>

<!ELEMENT title (#PCDATA)>
<!ELEMENT author (#PCDATA)>
<!ELEMENT department (#PCDATA)>
<!ELEMENT revisionDate (#PCDATA)>
<!ELEMENT abstract (#PCDATA)>
```

About Example 4.8

- The DTD language allows for liberal whitespace (spaces and carriage returns).

- XML element text can also contain liberal amounts of whitespace.

4.9.xml: Getting the Text Right

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE procedure SYSTEM "ex_4.9.dtd">
<procedure>
  <title>CNC Router Lubrication</title>
  <author>Don Wallace</author>
  <department>Research &amp; Development</department>
  <revisionDate>2006-04-01</revisionDate>
  <abstract>
    <paragraph>
      The Larken&#174; 2424 CNC Router is a high-speed
      computer-controlled woodworking tool.  It was purchased
      new in 2004 and was fully lubricated when purchased.
      The need for further lubrication depends on the number
      of hours of use as well as the elapsed calendar time.
      With heavy usage, the machine should be
      lubricated every 9 months (lubrication interval should always
      be &lt; 18 months).
    </paragraph>
    <paragraph>
      Each of the three screw drives should be lubricated with a dry
```

```
       Teflon spray. Do not use any wet lubricants, as they will
       attract dust and cause fouling.  Before applying the lubricant,
       remove dust from screw mechanisms using compressed air
       and a clean brush.
    </paragraph>
  </abstract>
  <details>
    The detailed procedure will go right here!
  </details>
</procedure>
```

```
<!ELEMENT procedure (
    title,
    author,
    department,
    revisionDate,
    abstract,
    details
)>

<!ELEMENT title (#PCDATA)>
<!ELEMENT author (#PCDATA)>
<!ELEMENT department (#PCDATA)>
<!ELEMENT revisionDate (#PCDATA)>

<!ELEMENT abstract (paragraph*)>
<!ELEMENT paragraph (#PCDATA)>

<!ELEMENT details (#PCDATA)>
```

- In their simplest form, paragraphs contain only #PCDATA.

- The built-in general entities (<, &, >, &apos and ") may be used in entity references without making any declarations in the DTD.

- Character references (like ®) do not require declarations in the DTD.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE procedure SYSTEM "ex_4.10.dtd">
<procedure>
  <title>CNC Router Lubrication</title>
  <author>Don Wallace</author>
  <department>Research &amp; Development</department>
  <revisionDate>2006-04-01</revisionDate>
  <abstract>
    <paragraph>
      The <equipment>Larken&#174; 2424 CNC Router</equipment>
      is a high-speed computer-controlled
      woodworking tool.  It was purchased new in 2004 and was fully
      lubricated when purchased.  The need for further lubrication
      depends on the number of hours of use as well as the elapsed
      calendar time.  With heavy usage, the machine should be
      lubricated every 9 months (lubrication interval should always
      be &lt; 18 months).
    </paragraph>
    <paragraph>
      Each of the three screw drives should be lubricated with a dry
```

```
      <supply>Teflon spray</supply>. Do not use any wet lubricants,
       as they will
      attract dust and cause fouling.  Before applying the lubricant,
      remove dust from screw mechanisms using compressed air
      and a clean brush.
    </paragraph>
  </abstract>
  <details>
    The detailed procedure will go right here!
  </details>
</procedure>
```

```
<!ELEMENT procedure (
    title,
    author,
    department,
    revisionDate,
    abstract,
    details
)>

<!ELEMENT title (#PCDATA)>
<!ELEMENT author (#PCDATA)>
<!ELEMENT department (#PCDATA)>
<!ELEMENT revisionDate (#PCDATA)>

<!ELEMENT abstract (paragraph*)>
<!ELEMENT paragraph (#PCDATA | equipment | supply)*>
<!ELEMENT equipment (#PCDATA)>
<!ELEMENT supply (#PCDATA)>

<!ELEMENT details (#PCDATA)>
```

- More complex paragraphs contain mixed content.

- The content model for mixed content is:
  `(#PCDATA | element1 | element2 | ... | elementn)*`

- Modifying elements that contain only text will have a content model of:
  `(#PCDATA)`

- Modifying elements that contain further mixed content will have a content model of:
  `(#PCDATA | element1 | element2 | ... | elementn)*`

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE procedure SYSTEM "ex_4.11.dtd">
<procedure>
  <title>CNC Router Lubrication</title>
  <author>Don Wallace</author>
  <department>Research &amp; Development</department>
  <revisionDate>2006-04-01</revisionDate>
  <abstract>
    <paragraph>
      The <equipment>Larken&#174; 2424 CNC Router</equipment>
      is a high-speed computer-controlled
      woodworking tool.  It was purchased new in 2004 and was fully
      lubricated when purchased.  The need for further lubrication
      depends on the number of hours of use as well as the elapsed
      calendar time.  With heavy usage, the machine should be
      lubricated every 9 months (lubrication interval should always
      be &lt; 18 months).
    </paragraph>
    <paragraph>
      Each of the three screw drives should be lubricated with a dry
```

```
    <supply>Teflon spray</supply>. Do not use any wet lubricants,
     as they will
    attract dust and cause fouling.  Before applying the lubricant,
    remove dust from screw mechanisms using compressed air
    and a clean brush.
  </paragraph>
</abstract>

<details>
  <frequency>Every 9 to 18 months</frequency>
  <duration>1 hour</duration>

  <steps>

    <step name="Determine Need for Lubrication">
      <paragraph>Follow the schedule defined elsewhere in
      this procedure.  If the machine should start to make a
      persistent squeaking or howling noise, lubricate the screw
      mechanism causing the noise immediately.</paragraph>
    </step>
```

```
<step name="Procure Supplies">
  <paragraph>Use only dry <supply>Teflon spray</supply>.
  </paragraph>
</step>

<step name="Clean Machine First">
  <paragraph>Using the shop vac or a fine brush, remove any
  dust or chips from all parts of the router.  Pay particular
  attention to removing dust from each screw
  mechanism.</paragraph>
  <paragraph>Take special care not to damage the threads of
  a screw mechanism while cleaning.  <warning>Do not use
  any liquid or spray cleaners.</warning></paragraph>
</step>

<step name="Apply Lubricant">
  <paragraph>Spray each screw mechanism lightly with the
  lubricant.  Clean any overspray off of visible machine parts
  using a soft damp cloth.</paragraph>
```

```
        </step>

      </steps>

    </details>

  </procedure>
```

```
<!ELEMENT procedure (
    title,
    author,
    department,
    revisionDate,
    abstract,
    details
)>

<!ELEMENT title (#PCDATA)>
<!ELEMENT author (#PCDATA)>
<!ELEMENT department (#PCDATA)>
<!ELEMENT revisionDate (#PCDATA)>

<!ELEMENT abstract (paragraph*)>
<!ELEMENT paragraph (#PCDATA | equipment | supply | warning)*>
<!ELEMENT equipment (#PCDATA)>
<!ELEMENT supply (#PCDATA)>
<!ELEMENT warning (#PCDATA)>
```

```
<!ELEMENT details (
    frequency,
    duration,
    steps
)>
<!ELEMENT frequency (#PCDATA)>
<!ELEMENT duration (#PCDATA)>

<!ELEMENT steps (step*)>
<!ELEMENT step (paragraph*)>
<!ATTLIST step
    name CDATA #REQUIRED>
```

- An element like `<paragraph>` will frequently appear as a child of more than one element.

- For this to work, `<paragraph>` and all of its mixed content modifying elements must be appropriate for all contexts in which they can appear.

- Remember to add the modifying element `<warning>` to the content model for `<paragraph>` and as an element declaration.