Unit 3: HTML 5 and Features

3.1. Introduction

- HTML 5 is the fifth and current version of HTML. It has improved the markup available for documents and has introduced application programming interfaces (API) and Document Object Model (DOM).
- It has introduced various new features like drag and drop, geo-location services.

Features of HTML5:

- Supports audio and video controls using <audio> and <video> tag.
- There are new graphics elements including vector graphics and tags.
- Introduced new semantic elements like <header>, <footer>, <section>, and <article> for improved structure.
- Drag and drop features
- Provides the localStorage API, allowing web applications to store data locally on the user's device.
- Web storage facility.
- Allows drawing various shapes like circle, triangle, rectangle.
- Enables websites to access a user's geographical location and services.
- Uses SQL database to store data offline.
- Capable of handling incorrect syntax.

Advantage:

- All browser supported
- Geolocation support
- More devices friendly
- Easy to use and implement
- HTMLs in integration with CSS, JavaScript etc.
- Multimedia support
- Short and simple syntax
- Improved security features
- Include semantic tags
- Cross-platform support
- Offline Application cache

Disadvantages:

- Client-side rendering
- Local storage is less secure
- Different video supports for different browsers
- Media licensing cost
- Doesn't support old browsers
- Tough to handle responsiveness on the range of devices

3.2. Difference between HTML and HTML 5

- HTML5 is more complete and easier than HTML, it has lots of new tags like <header>, <footer>, <nav>, <Audio>, <video>, <main> etc. It also supports graphic.
- The differences between HTML and HTML 5 are tabulated below.

HTML	HTML5
It didn't support audio and video without the use of flash player support.	It supports audio and video controls with the use of <audio> and <video> tags.
It uses cookies to store temporary data.	It uses SQL databases and application cache to store offline data.
Does not allow JavaScript to run in the browser.	Allows JavaScript to run in the background. This is possible due to JS Web worker API in HTML5.
Vector graphics are possible in HTML with the help of various technologies such as VML, Silver-light, Flash, etc.	Vector graphics are additionally an integral part of HTML5 like SVG and Canvas.
It does not allow drag and drop effects.	It allows drag and drop effects.
Not possible to draw shapes like circle, rectangle, triangle etc.	HTML5 allows to draw shapes like circle, rectangle, triangle etc.
It works with all old browsers.	It supported by all new browser like Firefox, Mozilla, Chrome, Safari, etc.
<HTML>,<Body> , and <Head> tags are mandatory while writing a HTML code.	These tags can be omitted while writing HTML code.
Older version of HTML are less mobile-friendly.	HTML5 language is more mobile-friendly.
Doctype declaration is too long and complicated.	Doctype declaration is quite simple and easy.
Elements like nav, header were not present.	New element for web structure like nav, header, footer etc.
Character encoding is long and complicated.	Character encoding is simple and easy.
It is almost impossible to get true GeoLocation of user with the help of browser.	One can track the GeoLocation of a user easily by using JS GeoLocation API.
It cannot handle inaccurate syntax.	It is capable of handling inaccurate syntax.
Being an older version, it is not fast, flexible, and efficient as compared to HTML5.	It is efficient, flexible and faster in comparison to HTML.
Attributes like charset, async and ping are absent in HTML.	Attributes of charset, async and ping are a part of HTML 5.

- There are many HTML elements which have been modified or removed from HTML5. Some of them are listed below:

Element	In HTML5
<applet>	Changed to <object>
<acronym>	Changed to <abbr>
<dir>	Changed to
<frameset>	Removed
<frame>	Removed
<noframes>	Removed
<strike>	No new tag. CSS is used for this
<big>	No new tag. CSS is used for this
<basefont>	No new tag. CSS is used for this
<font>	No new tag. CSS is used for this
	No new tag. CSS is used for this
<tt>	No new tag. CSS is used for this

3.3. HTML 5 New Semantics Elements (HEADER, FOOTER, SECTION)

- Html tags (elements) are classified into two types:
  1. **Semantic Element**
     - Semantic elements are the elements that describe their meaning to both the developer as well as to the browser.
     - Semantic elements have meaningful names which tell about type of the content.
     - HTML 5 introduces many semantic elements as mentioned below which make the code easier to write and understand for the developer as well as instructs the browser on how to treat them.
     - HTML5 provides us with many semantic elements as listed below
       a) <article>
       b) <aside>
       c) <details>
       d) <figcaption>
       e) <figure>
       f) <footer>
       g) <header>
       h) <main>
       i) <mark>
       j) <nav>
       k) <section>
       l) <summary>
       m) <time>

HTML <header> Element:

- The <header> element represents a container for introductory content or a set of navigational links.
- A <header> element typically contains:
  - one or more heading elements (<h1> - <h6>)
  - logo or icon
  - authorship information

HTML <footer> Element:

- The <footer> element defines a footer for a document or section.
- A <footer> element typically contains:
  - authorship information
  - copyright information
  - contact information
  - sitemap
  - back to top links
  - related documents
- You can have several <footer> elements in one document.

Example: Header and footer Element

```
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Your Website</title>
</head>
<body>
    <header>
        <h1>Kathmandu Institute of Technology </h1>
        <nav>
            <a href="#">Home</a>
            <a href="#">About</a>
            <a href="#">Services</a>
            <a href="#">Contact</a>
        </nav>
        <img src="./Photo/kit banner.png" alt="kit college" width="500px"
height="100">
    </header>

    <footer>
        <p>Contact: contact@example.com | Phone:01567432</p>
        <p>&copy; 2024 KIT Engineering College. All rights reserved.</p>
    </footer>

</body>
</html>
```

Output:

HTML <section> Element:

- The Section tag defines the section of documents such as chapters, headers, footers, or any other sections. The section tag divides the content into sections and subsections.
- The section tag is used when requirements of two headers or footers or any other section of documents are needed.
- Section tag grouped the generic block of related contents.
- Examples of where a <section> element can be used:
  - Chapters
  - Introduction
  - News items
  - Contact information
- A web page could normally be split into sections for introduction, content, and contact information.
- Syntax:

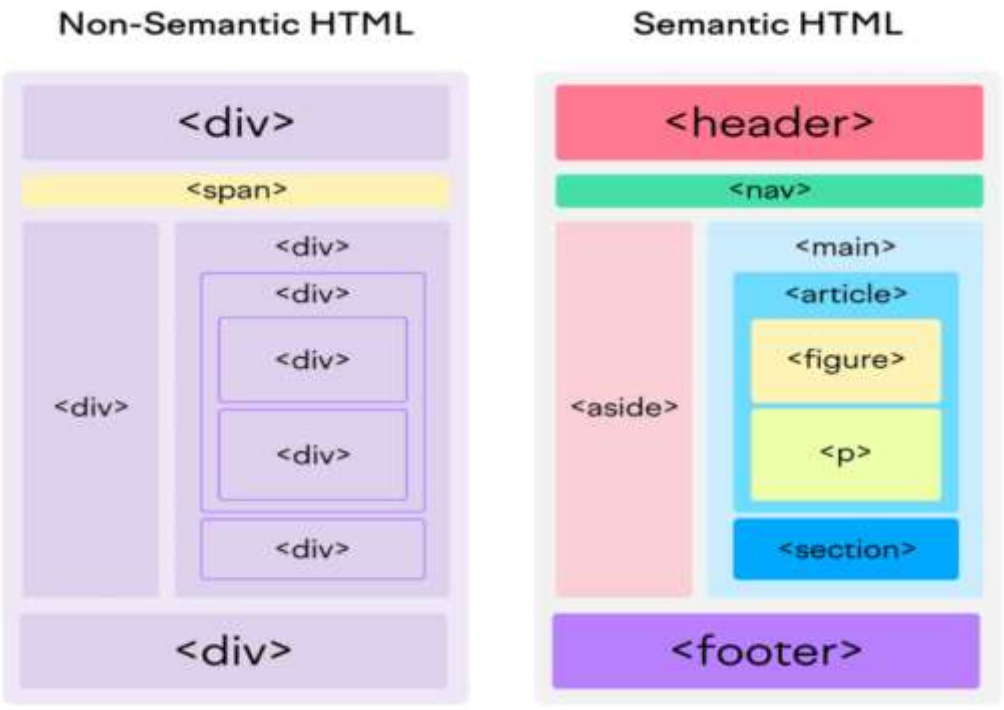
  <section> Section Contents </section>

- Example:

```
<!DOCTYPE html>
<html>
<body>
    <head>
        <title> Section element </title>
    </head>
    <section>
        <h1>
             Section 1
        </h1>
        <p>
            Content of section 1
        </p>
    </section>
    <section>
        <h1>
            Section 2
        </h1>
        <p>
            Content of section 2
        </p>
    </section>
</body>
</html>
```

2. **Non-Semantic element**
   - Non-semantic HTML refers to the use of HTML elements that do not have any inherent meaning, but are used to format and style content on a web page.
   - These elements include div and span, which are commonly used to group and style content, but do not provide any information about the meaning or purpose of that content.
   - Tags like , fall under non semantic categories as their name don't tell anything about kind of contents is present in it.

Semantics vs Non-Semantics Elements:



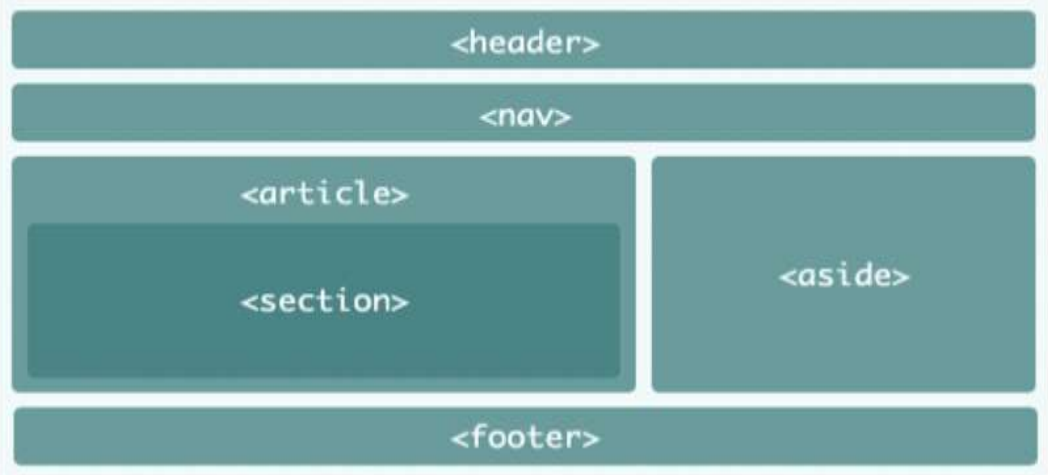
3.4. HTML 5 New Elements

- In HTML5, there are lots of new elements are added which provides some extra functionality to create an attractive and dynamic website. With the help of these elements.
- The following tags (elements) have been introduced in HTML5
  1. <article>
     - It is used to specify a blog, a magazine or a newspaper article or any other independent piece of content in a document.
  2. <aside>
     - It defines the content which provide information about the main content.
  3. <details>
     - It defines additional information which only visible as per user demand.
     - It is used to define any additional information on a topic or a summary.
  4. <dialog>
     - It represents a dialog box or other interactive components
     - It is used to specify a window or a dialog box.
  5. <figcaption>
     - It defines caption for the <figure> element.

6. <figure>
   - It defines a self-contained content, and referenced as a single unit.
   - It is used to specify a self-contained content like photos, diagrams etc.
7. <header>
   - It defines the introductory or navigational content of the webpage.
8. <footer>
   - It is used to represent a footer for a section and can contain information about the author, copyright information etc.
9. <section>
   - It is used to specify a section in an HTML document.
10. <main>
    - It is used to specify the main content of a document.
11. <mark>
    - It is used to represent the text which is highlighted or marked for reference or notation purposes
12. <meter>
    - It is used to determine a scalar value within a given range.
13. <nav>
    - It is used to represents the section which contains navigation links.
14. <progress>
    - It defines a progress bar which shows completions progress of a task.
    - It is used to represents a completion of a task, such as downloading or when performing a series of expensive operations.
15. <output>
    - It is used to specify the output of a calculation or an outcome of the user action.
16. <wbr>
    - It is used to specify a line break opportunity.
17. <datalist>
    - It is used to represent predefined list for input <option> element.
18. <canvas>
    - It allows drawing graphics and animations via scripting.
19. <svg>
    - It is used to draw scalable vector graphics and used to display shapes.
20. <audio>
    - It is used to define an audio file in HTML.
21. <video>
    - It is used to specify a video file in HTML
22. <source>
    - It is used to specify multiple media resources for a media element.
23. <embed>
    - It is used to specify a container for an external file, application or a media.
24. <Track>
    - It is used to specify the text tracks for an <audio> or a <video> element.

HTM Interactive Elements

- HTML5 introduced several new interactive elements that enhance the structure and functionality of web pages. Here are some of the key interactive elements introduced in HTML5:
  - <article>
  - <section>
  - <nav>
  - <header>
  - <footer>
  - <aside>
  - <details> and <summary>



HTML Graphics:

- HTML graphics refers to the visual elements and multimedia content that can be integrated into HTML documents to enhance the visual appeal and interactivity of web pages.
- Graphics in HTML is used for an effective representation of graphics including maps, photographs, designs and patterns, family trees, diagrams, architectural or engineering blueprints, bar charts and pie charts, typography, schematics, line art, flowcharts, etc.
- There are two modern web technologies for creating rich drawn graphics within the browser: HTML5 Canvas and Scalable Vector Graphics (SVG).

1) HTML Canvas:

- The HTML <canvas> element is used to draw graphics, on the fly, via JavaScript.
- The <canvas> element is only a container for graphics. We must use JavaScript to actually draw the graphics.
- Canvas has several methods for drawing paths, boxes, circles, text, and adding images.
- A canvas is a rectangular area on an HTML page. By default, a canvas has no border and no content.
- Example:

```
<canvas id="myCanvas" width="200" height="100"></canvas>
```

2) SVG (Scalable Vector Graphics):

- SVG stands for Scalable Vector Graphics
- SVG is used to define graphics for the Web
- The HTML <svg> element is a container for SVG graphics.
- SVG has several methods for drawing paths, boxes, circles, text, and graphic images.

- Example:

```
<!DOCTYPE html>
<html>
<body>
<svg width="100" height="100">
        <circle cx="50" cy="50" r="40" stroke="green" stroke-width="4"
fill="yellow" />
    </svg>
</body>
</html>
```

HTML Multimedia:

- HTML multimedia refers to the integration of various types of media elements, such as audio, video, and interactive content, into HTML documents to enhance the user experience on web pages.
- HTML (Hypertext Markup Language) provides specific elements that allow developers to embed multimedia content directly within a webpage.
- These elements enable the presentation of audio, video, and interactive applications, making web pages more dynamic and engaging
- HTML allows adding different multimedia files on our website by various multimedia tags. These tags include

1) HTML Video:

- The HTML <video> element is used to show a video on a web page.
- Example:

```
<!DOCTYPE html>
<html>
<body>
    <video width="520" height="440" controls autoplay>
        <source src="./Video/Resham -Nepathya.mp4" type="video/mp4">
        Your browser does not support the video tag.
    </video>
</body>
</html>
```

2) **HTML Audio:**

- The HTML <audio> element is used to play an audio file on a web page.
- Example:

```
<!DOCTYPE html>
<html>
<body>
    <audio controls autoplay>
        <source src="resam.mp3" type="audio/mpeg">
    </audio>
</body>
</html>
```