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ADVANCING SOCIAL INCLUSION THROUGH TECHNOLOGY AND EMPOWERMENT

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Assistive Technologies (AT)

This education materials were developed by the help of
CA19104 – COST Action
Advancing Social inclusion through Technology and EmPowerment (a-STEP)
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Assistive Technologies (AT)

5-1. Lessons for Developers: Accessibility

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Outline

- What is Accessibility?
- What is Web Accessibility?
- Why Web Accessibility is Important?
- How can we ensure Web Accessibility?

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What is Accessibility?

What is Accessibility?

- ✓Accessibility is a broad and an extensible term associated with people who have disabilities, incompetent skills, or situational-induced impairments.
- ✓It refers that people with special needs should be able to access, navigate, interact, and contribute to the information that is available on the Web/Internet, electronic resources/materials, and computer.
- ✓It is the composition of two major prototypes, such as
  - ❖Design/Development
  - ❖Usability
- ✓Design ensure the structure of the development
- ✓Usability ensure the acceptability of the development

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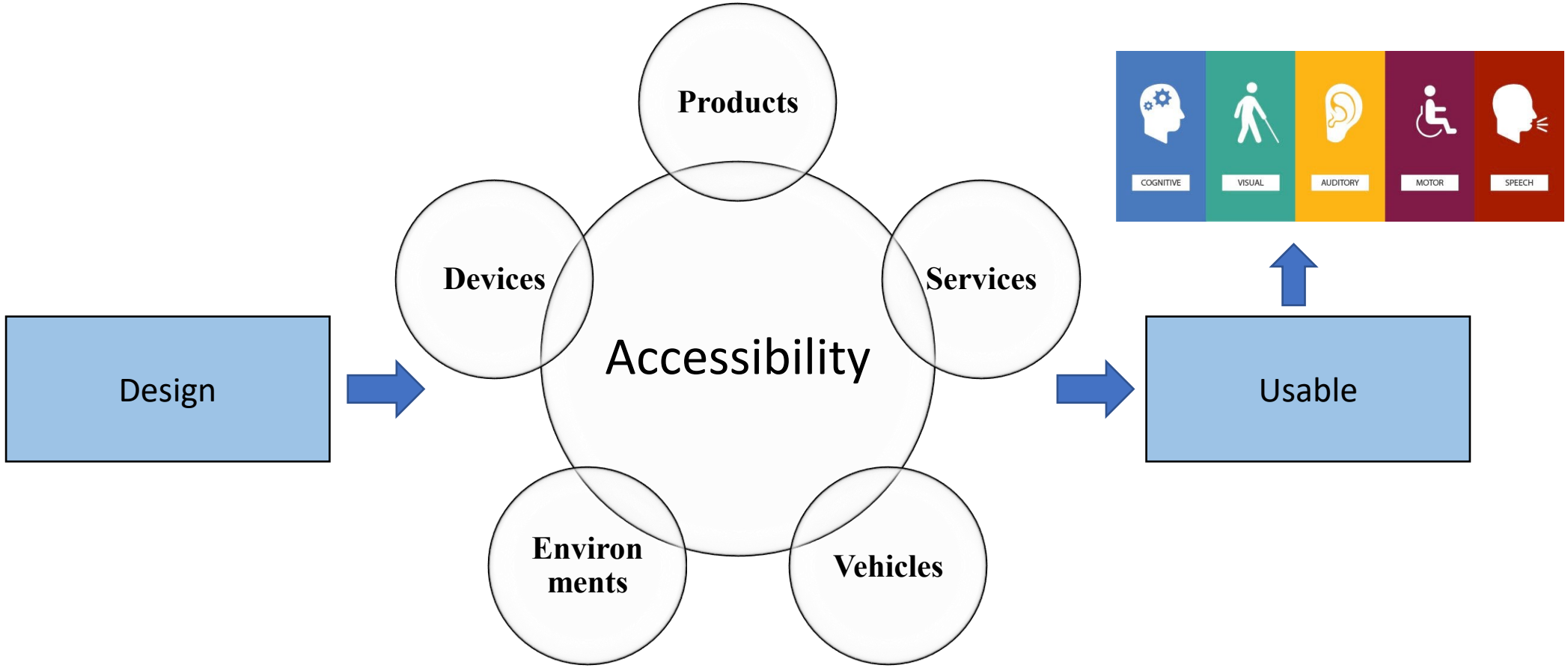
What is Accessibility?



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What is Accessibility?

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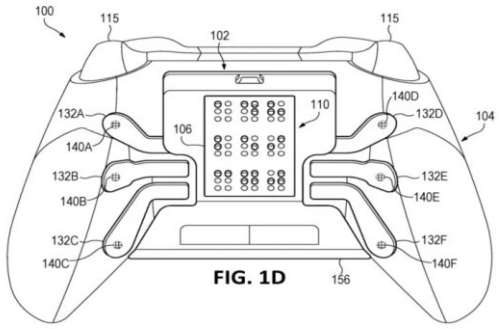
Products → Sensory friendly snack wrappers/packaging (Autism kids)

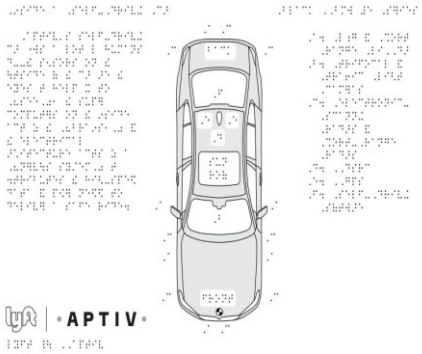
Devices → Accessible smart home assistant

Services → Web services, Software services

Environment → Serios Games (Brail video game displays)

Vehicles → Self driving car (AV)





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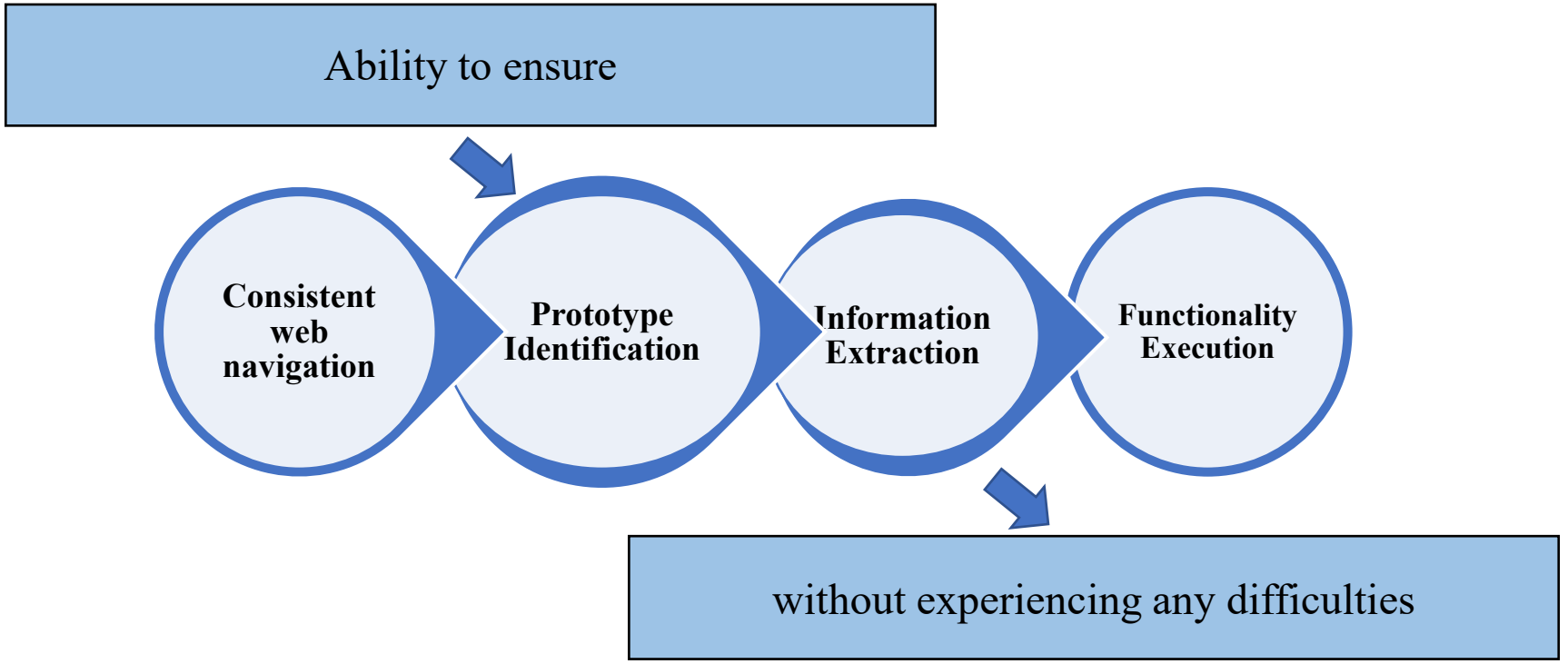
What is Web Accessibility?

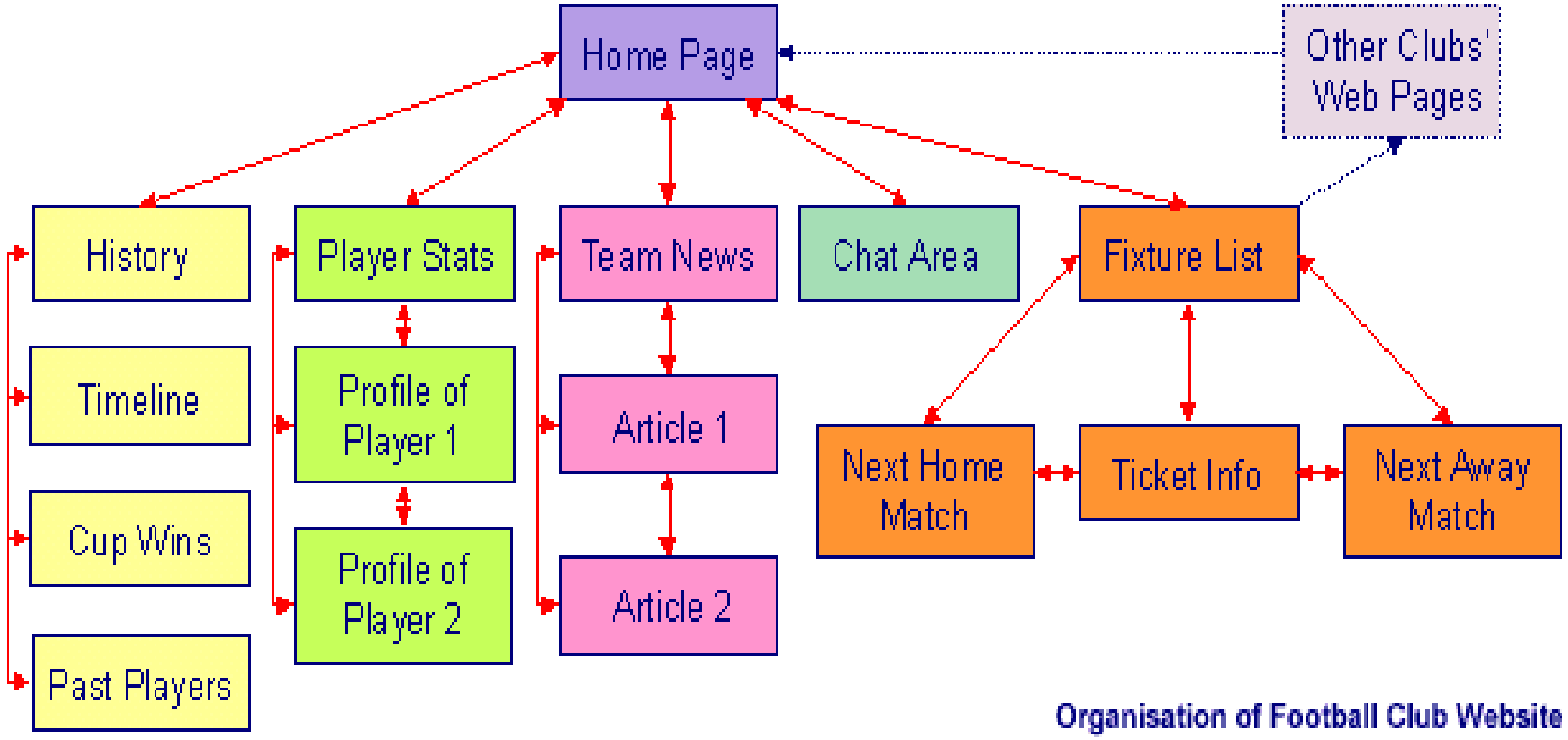
What is Web Accessibility?

✓Web Accessibility



What is Web Accessibility?

- ✓**Consistent web navigation:** Navigation is the process of browsing website according to the user interest. For example,



Organisation of Football Club Website

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What is Web Accessibility?

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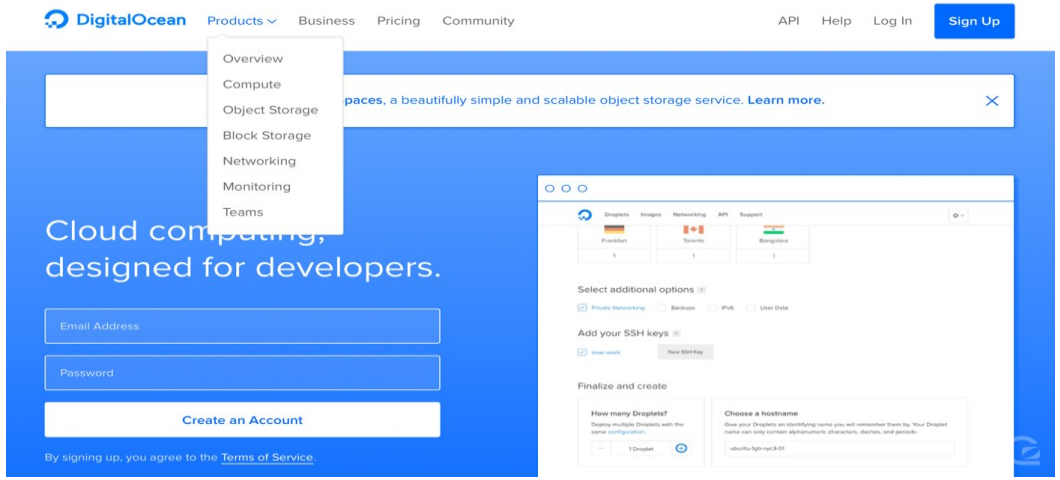
- ✓**Prototype Identification:** All the prototypes such as search field, header, body, drop down menu etc should be identifiable with its proper objective.



- ✓**Information Extraction:** Additional information resources should act properly. For example, search field might not provide the accurate information or do not response. External and internal links or hyperlinks might not working.
- ✓**Functionality Execution:** All the functions such as search field, form, submit button etc. should be executable properly

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Why Web Accessibility is Important?

Why Web Accessibility is Important?

- The prime objective to ensure web accessibility for make the accessing or browsing of website barrier free for the people with disabilities

- The major disability types are:

❖Vision Impairment (Fully blind, partially blind, color blind, low vision)

❖Hearing difficulty (deaf or hard of hearing)

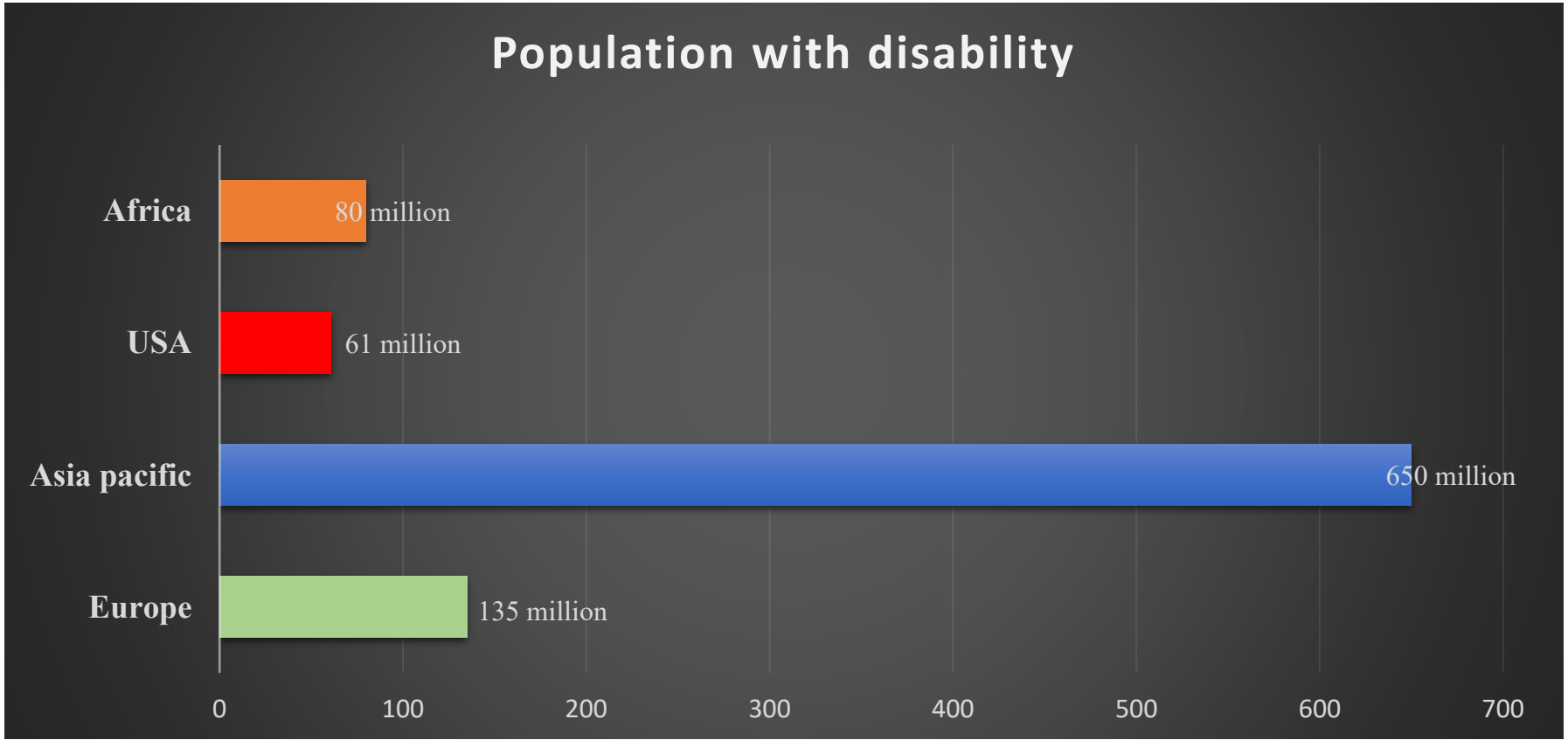
❖Cognitive disability (mild mental health conditions, intellectual disability, autism spectrum disorder (ASD)

❖Motion disability (movement problem, clicking problem)

❖Speech disability (can not speak, hard of speaking)

Why Web Accessibility is Important?

According to WHO, Over 1 billion (15%) people are living with some form of disability.



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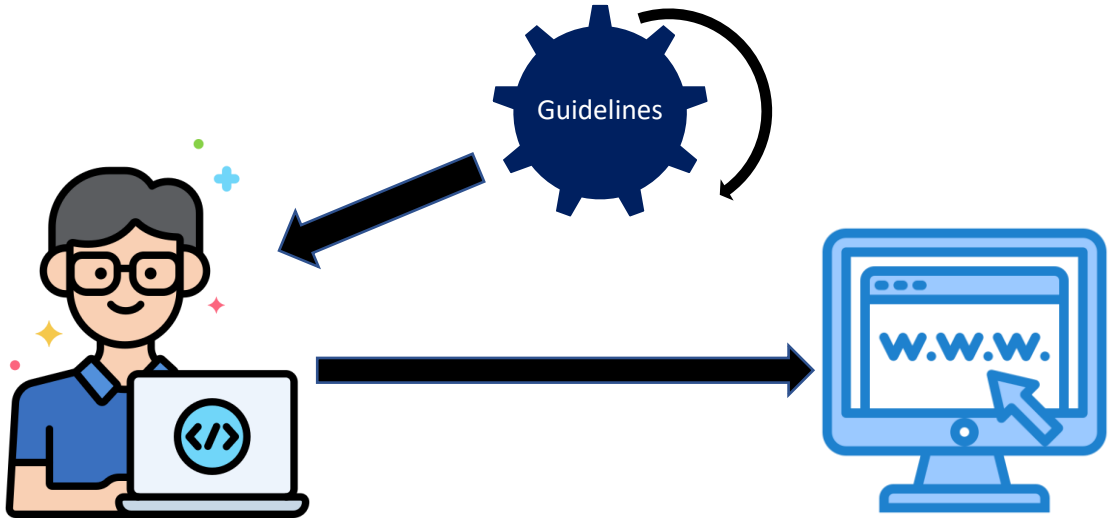
How can we ensure Web Accessibility?

How can we ensure Web Accessibility?

There are two ways to ensure accessibility

- **Ensuring Accessibility Guidelines during Development**



View of Web Accessibility Testing during development

How can we ensure Web Accessibility?

What are guidelines?

✓In the context of web, Guidelines are part of a series of accessibility guidelines proposed by the government of several countries and various public and private institutes.

✓The most prominent guidelines are:

- ❖WCAG (W3C, Universal guideline)
- ❖Section 508 (US guideline)
- ❖EN 301 549 (European guideline)
- ❖YD/T 1761-2012 (Chinese guideline)
- ❖WAI-ARIA (W3C, only for HTML attributes)
- ❖BITV (German guideline)
- ❖ISO 9241 (US guideline)

How can we ensure Web Accessibility?

What is Web Content Accessibility Guideline (WCAG)?

- ✓ WCAG is a documented guideline that explains all the accessibility criteria and step-by-step recommendations about implementation, improvement, and measurement of accessibility to provide a better user experience, especially for people with disabilities.
- ✓ It is the most widely used accessibility standard.
- ✓ It has five versions till now, including WCAG 1.0, WCAG 2.0, WCAG 2.1, WCAG 2.2, and WCAG 3.0 (draft version)
- ✓ All the guidelines have several success criteria and conformance level
- ✓ In total is has three conformance level: A, AA, and AAA
  - ❖ A refers might follow/implement according to the evaluation criteria
  - ❖ AA refers that guidelines should follow/implement
  - ❖ AAA refers that guidelines must be followed/implemented

***A details can be found: https://www.w3.org/TR/WCAG21/

How can we ensure Web Accessibility?

❑Evaluating the Developed Application (e.g., website)

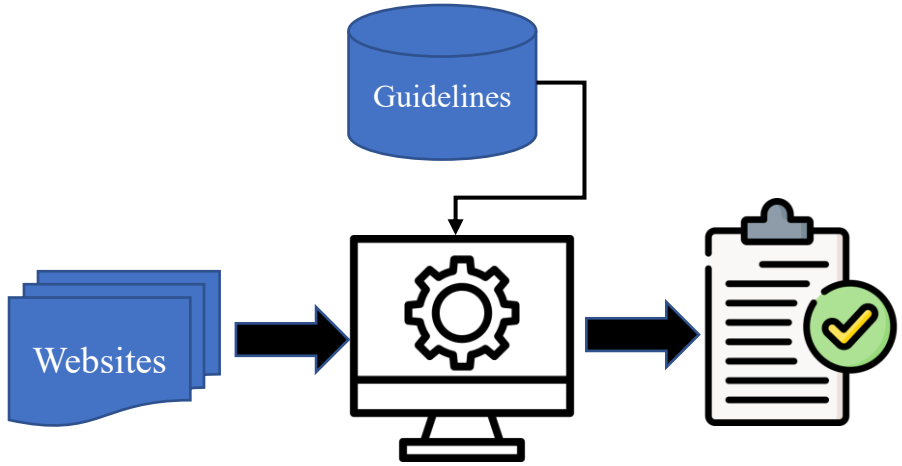
View of Web Accessibility Testing after development

How can we ensure Web Accessibility?

There are two types of evaluation system:

✓ **Automated Evaluation**

Automated testing refers to the validation of accessibility features of website content through computer programs against accessibility guidelines.



View of Automated Web Accessibility Testing

How can we ensure Web Accessibility?

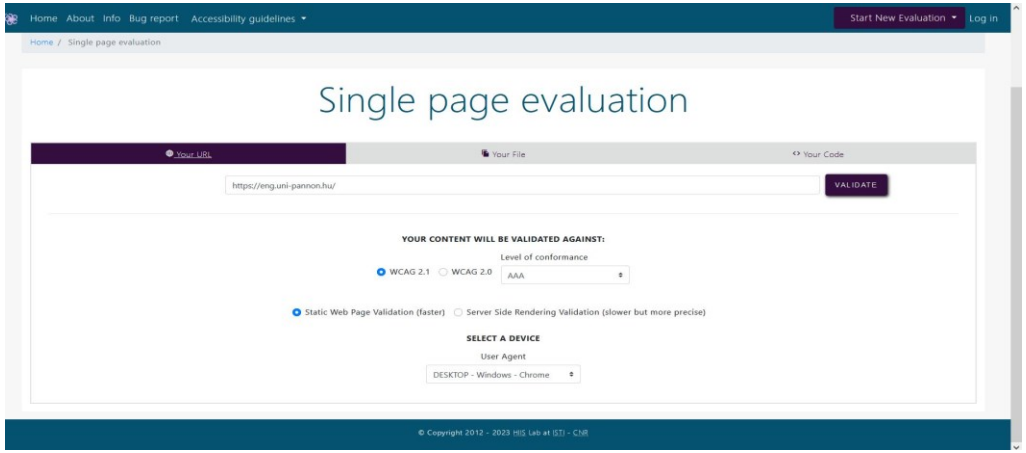
Several automated testing process has been introduced such as:

- Mauve++
- Nibbler
- WAVE
- Achecker
- TAW etc.

** More automated tools can be found: https://www.w3.org/WAI/ER/tools/

MAUVE++

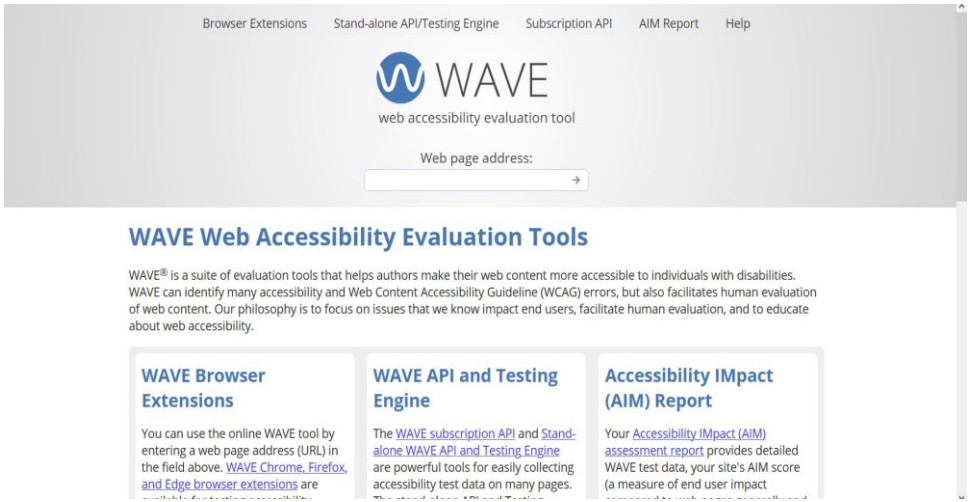
- MAUVE++ is an accessibility validator
- It provide an user friendly environment for Web *accessibility* evaluation
- It supports WCAG 2.1 and WCAG 2.0 guidelines
- It support both single page evaluation and full website evaluation
- It allow to test for both Level A, AA and AAA
- It compute the result in terms of four assessment criteria: Error, Warning, Pass and Not applicable
- It provides the overall accessibility score
- Link: https://mauve.isti.cnr.it/



MAUVE++ environment

WAVE

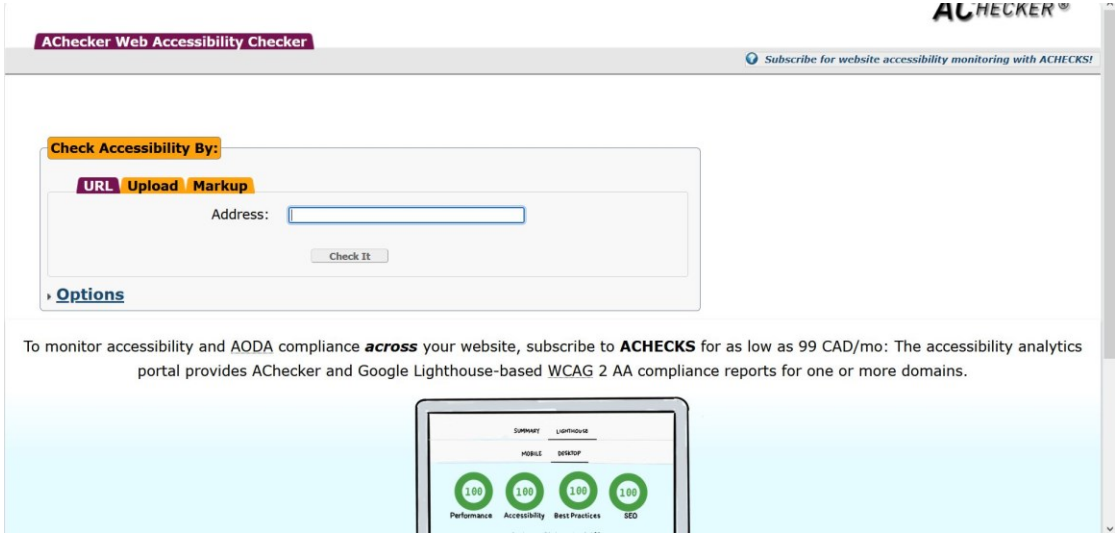
- WAVE is a suite of evaluation tools that helps authors make their web content more accessible to individuals with disabilities.
- It can identify many accessibility and Web Content Accessibility Guideline (WCAG) errors
- It also facilitates human evaluation of web content.
- It evaluate website in terms of six assessment criteria:
  - Errors
  - Contrast Errors
  - Alerts
  - Feature
  - Structural Elements
  - ARI



WAVE environment

AChecker

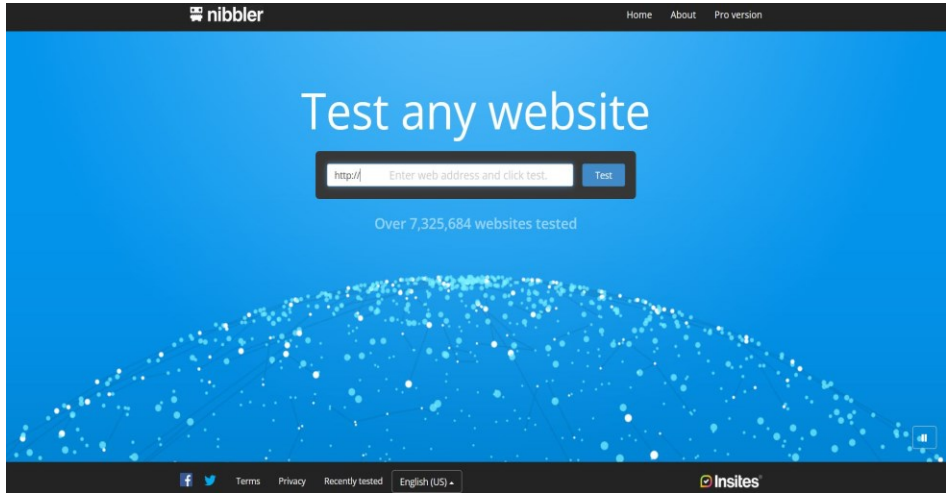
- AChecker is a Web accessibility evolution tool designed to help Web content developers and Web application developers ensure their Web content is accessible
- Additional criteria is it provides HTML and CSS validation also
- It assess in terms of three assessments criteria
  - Know Problems
  - Likely Problems
  - Potential Problems



AChecker environment

Nibbler

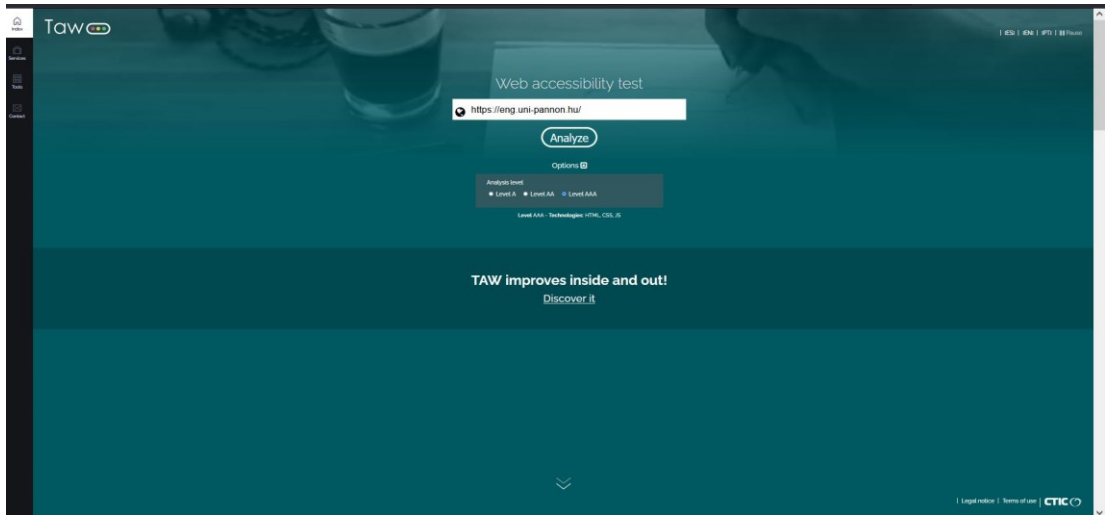
- Nibbler is a free tool for testing how good your website is, and what you can do to improve it.
- It also check accessibility, SEO, social media, and other compliances
- It provide overall accessibility score
- It assess websites and provide the result in terms of four assessment feature:
  - Accessibility
  - Experience
  - Marketing
  - Technology



AChecker environment

TAW

- TAW is an automatic on-line tool for analyzing website accessibility
- It developed based on technical reference Web Accessibility Guidelines (WCAG 2.1) of W3C
- It allow to test for Level A, AA and AAA
- It assess in terms of three assessment criteria:
  - Problems
  - Warnings
  - Not reviewed

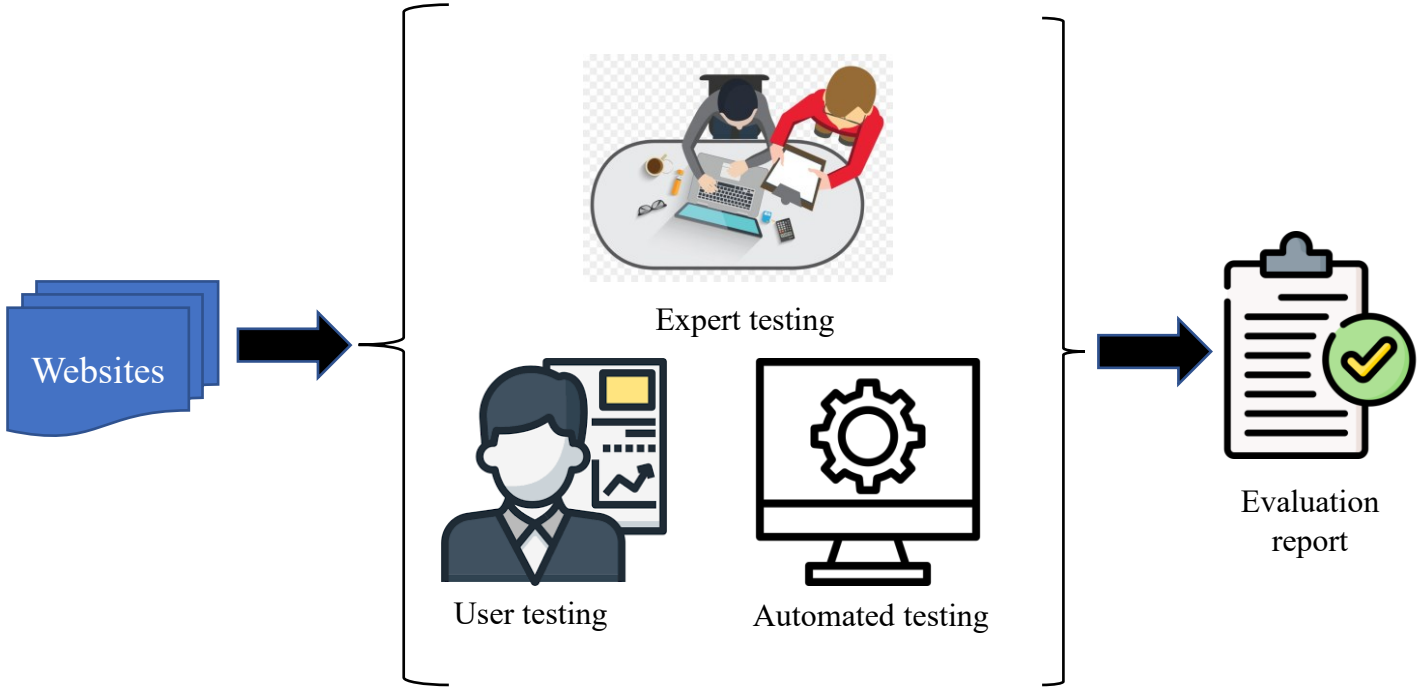


TAW environment

How can we ensure Web Accessibility?

✓Hybrid Evaluation

Hybrid evaluation process is the way of evaluating websites in terms of automated, user, and expert evaluation incorporating the user and expert requirements and suggestions to improve the effectiveness of the evaluation process.



View of Hybrid Web Accessibility Testing

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Exercise, Home Works

- Do evaluations of some WEB-pages using the five intoruced tools
- See the following links:
  - **W3C**: https://www.w3.org/
  - **Accessibility** link - > https://www.w3.org/WAI/
  - **Web Content Accessibility Guidelines**:: https://www.w3.org/WAI/standards-guidelines/wcag/
  - **Accessibility Principles**: https://www.w3.org/WAI/fundamentals/accessibility-principles/
  - **Stories of web users**: https://www.w3.org/WAI/people-use-web/user-stories/

Summary

- What is Accessibility?
- What is Web Accessibility?
- Why Web Accessibility is Important?
- How can we Ensure Web Accessibility?
- Exercises – Home works

Thank you for your kind attention!

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