Serious game and accessibility

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Serious game: learning, storytelling, gamification

Something to learn

A story to tell

A challenge to win

Serious game is the
third way between
two learning
methods

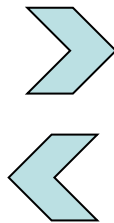# Two methods of learning

Symbols (language)

Direct experience

How we learn: a comparison

Symbols (language)

- lessons
- abstraction
- cognition
- solution
- passivity

Direct experience

- daily life
- concreteness
- emotion
- problem
- activity

How we learn: language

Advantages of language compared to direct experience

1. It is extremely efficient
2. It is extremely precise
3. It applies to anything
4. It encodes the experience of others

Disadvantages

1. It is not very effective
2. It involves emotions very little
3. It relies too much on memory
4. It makes the learner passive
5. It depends too much on the teacher
6. It can be boring

How we learn: experience

Advantages of experience compared to language

1. It is extremely effective
2. It involves emotions
3. The learner is active
4. It is interesting because it applies to already perceived problems

Disadvantages

?

The surprising Newton's Second Law of Motion (I)

$$\sum_{i}^{N} \vec{F_i} = m\vec{a}$$

sum of forces

mass of the body

acceleration

A body subjected to a constant force receives a constant acceleration

and, obviously, when the force stops being applied, it continues to move at a constant velocity

The surprising Newton's Second Law of Motion (II)

How we learn: the problems with experience

1. Can be misleading
2. Is limited to the tangible and immediate
3. Mistakes can be costly or dangerous
4. It is difficult to perceive cause-and-effect relationships
5. It's inefficient for complex learning

The game (serious game)…

a controlled experience between language and experience

A serious game

■ ■ ■

What is accessibility

Italy: Law 4/2004: «*Provisions to promote and simplify access for users, particularly for people with disabilities, to computer tools)*»

accessibility

«the ability of IT systems ... to deliver services and provide information that can be accessed without discrimination, even by those who, due to disabilities, require assistive technologies or special configurations»

Three objectives

1. Develop a fully accessible serious game

2. Provide a complete and satisfying experience even for the person with blindness

3. Not create an "accessible version," but a single learning object for everyone

The persons with blindness and digital content

Screen readers

Digital content

Personal computer

Browser

The persons with blindness use the keyboard as sighted people use their eyes

Accessibility and Usability

1. The Web Content Accessibility Guidelines (WCAG) published by the Web Accessibility Initiative (WAI), which is part of the World Wide Web Consortium (W3C)
An accessible content must be:
   - Perceivable
   - Operable
   - Understandable (for less experienced users)
   - Robust (working on different devices and technologies)
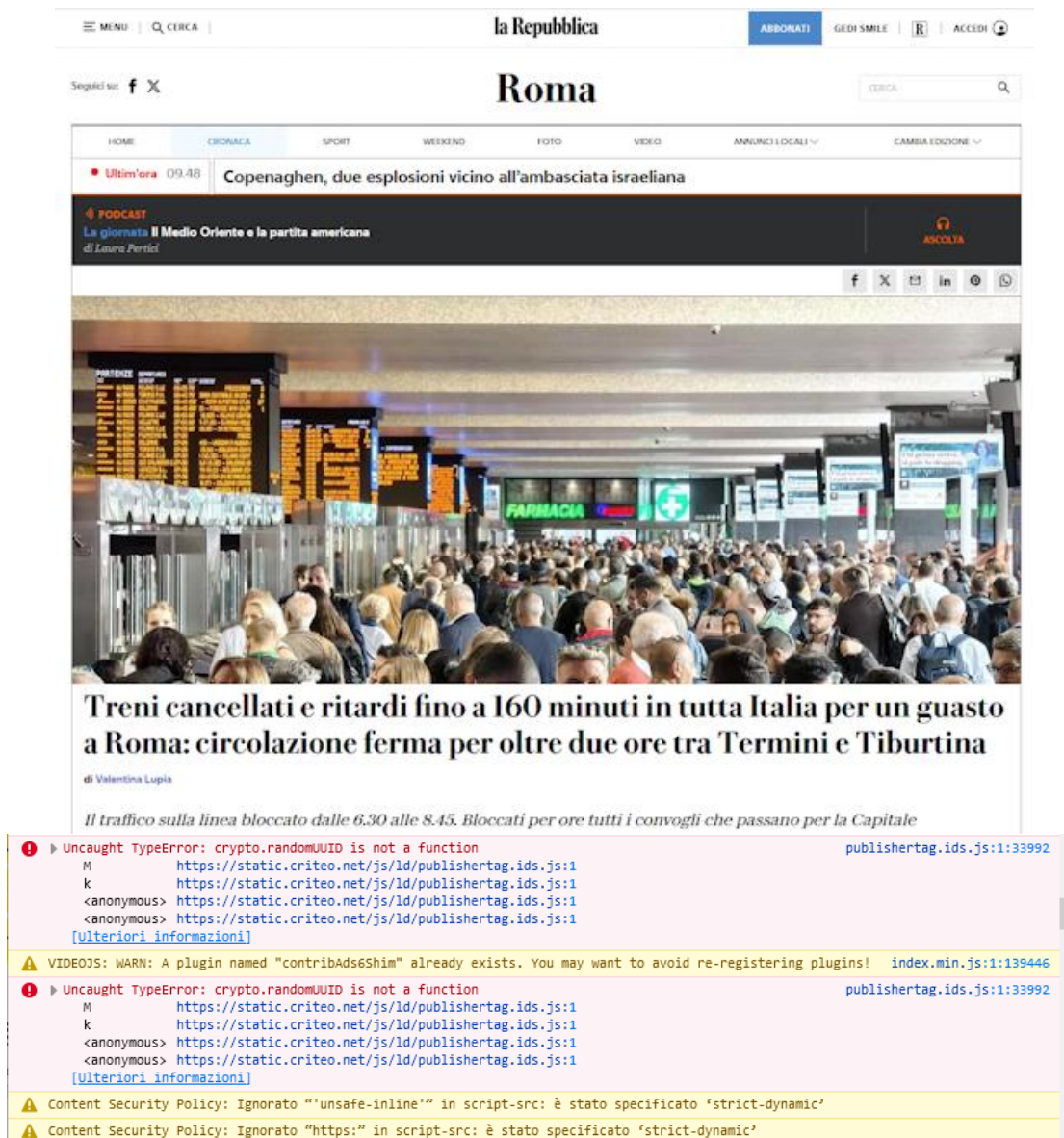
2. Usability criteria
A usable content must be:
   - Easy to use
   - Satisfactory

Accessibility of serious games: 1 - Correct HTML code

The HTML code must be error-free

browsers are tolerant, but screen readers are much less so

Arrange information in the HTML code to make it logical and understandable

Accessibility of serious games: 3 – semantic elements (1)

newspaper name

local news headline

menu

breaking news

podcast

share link

article image

article title

author

article subtitle

publication date and time

article body

advertising

Accessibility of serious games: 3 – semantic elements (2)

Use semantic tags and attributes


```
<fieldset id="dia_daf_pagina" draggable="false...">

    <legend id="dia_daf_pagina_titolo" ...>Cosa risponde il Responsabile?</legend>

    <div id="dia_daf_pagina_0" ... >

        <img alt="" src="immagini/s_radio.png" id="dia_daf_pagina_0_sfondo" ...>

        <input id="dia_daf_pagina_0_input" type="radio"  name="dia_daf_pagina_a...>

        <label id="dia_daf_pagina_0_testo"  for="dia_daf_pagina_0_input«...>

            Ho capito, preparo subito i documenti per l'appalto.

        </label>

     </div>

    ...

</fieldset>
```

Accessibility of serious games: 4 – add/hide

Optimize the content for screen readers

Le situazioni

Alessandro...

○ è /○ non è sotto stress per il superlavoro

è responsabile del Ced, il cui organico è
○ adeguato /○ insufficiente

JAWS

Alessandro...

is/is not under stress

due to overwork
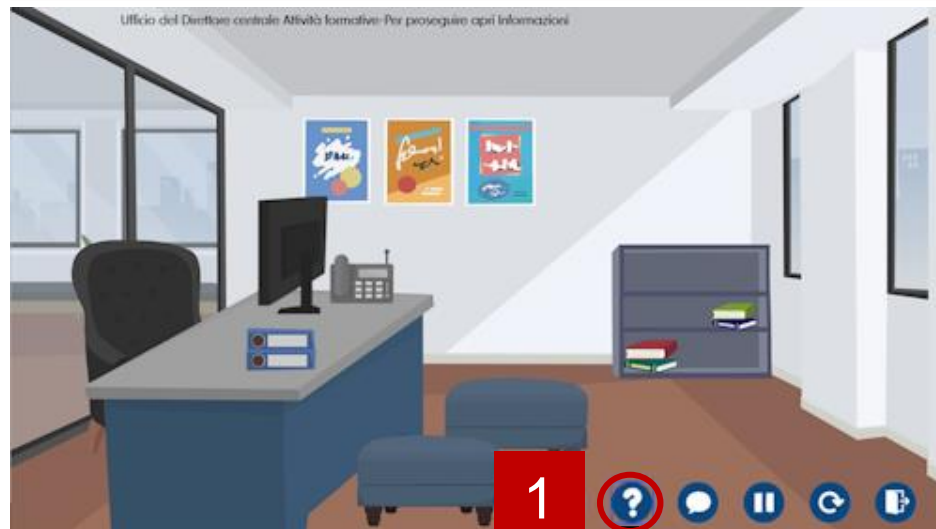
Is Alessandro stressed due to overwork?

- yes

- not

Accessibility of serious games: 5 – manage events

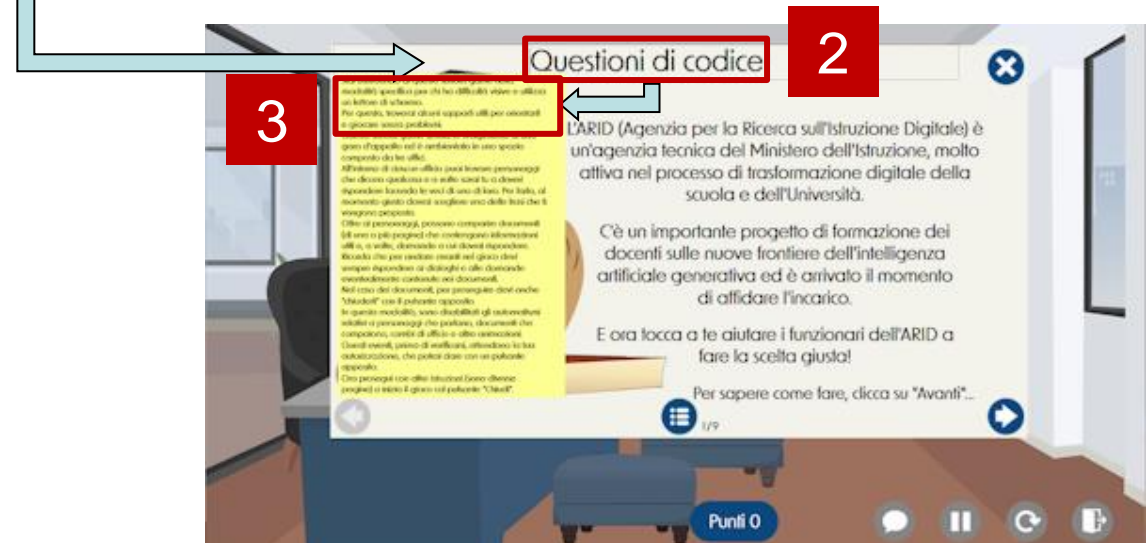## Automatic events require prior announcement and "authorization"

Accessibility of serious games: 6 – handle focus

Dynamically shift focus to the most relevant information

Browser automation isn't always enough

An accessible serious game

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