myWebAccess: a platform for repairing, enhancing and re-distributing Web Services accessible to people with disability

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Outline

- Introduction
- Web Services
- myWebAccess Platform
- Support Accessible and Multi-Channel Web Interfaces
- Evaluation
- Further Research

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Web Accessibility (1/2)

- For **equitable** use of infrastructure and services
- **Adoption** of technical specifications
  - WCAG 2.0, Section 508, Mobile Web Best Practices
- **Offers** access to most possible set of citizens:
  - including elderly and people with disabilities
  - people with low experience in the use of computers
- **Facilitates** interoperability with technology solutions
  - assistive technology solutions (e.g., screen reader)
  - modern technology solutions (e.g., navigator with voice recognition for car drivers)

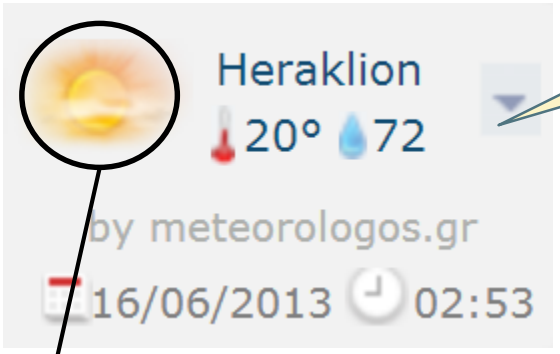
Web Accessibility (2/2)

- Inherent problems
  - Business tools and services (e.g. CMS) do not support construction of accessible content
  - Lack of knowledge by manufacturers
  - No-valid markup
  - Ignorance of technical specifications (WCAG)
- Accessibility of Web becomes extremely poor

- Research of ICS-FORTH
  - 2004-2008, 257 Greek websites
    - 1% accessible websites
    - 14% with basic accessibility
    - 85% not accessible
- Challenge 
  - Utilization of Web Services in order to improve the accessibility of the content and the presentation to multiple design templates and devices

EXAMPLE

Structural component on the Website www.in.gr




```
<strong class="status">
    <a href="http://weather.in.gr/?gid=21">
        <img src="/Themes/pngNoshadow/3.png">
    </a>
</strong>
```

alt= "???"

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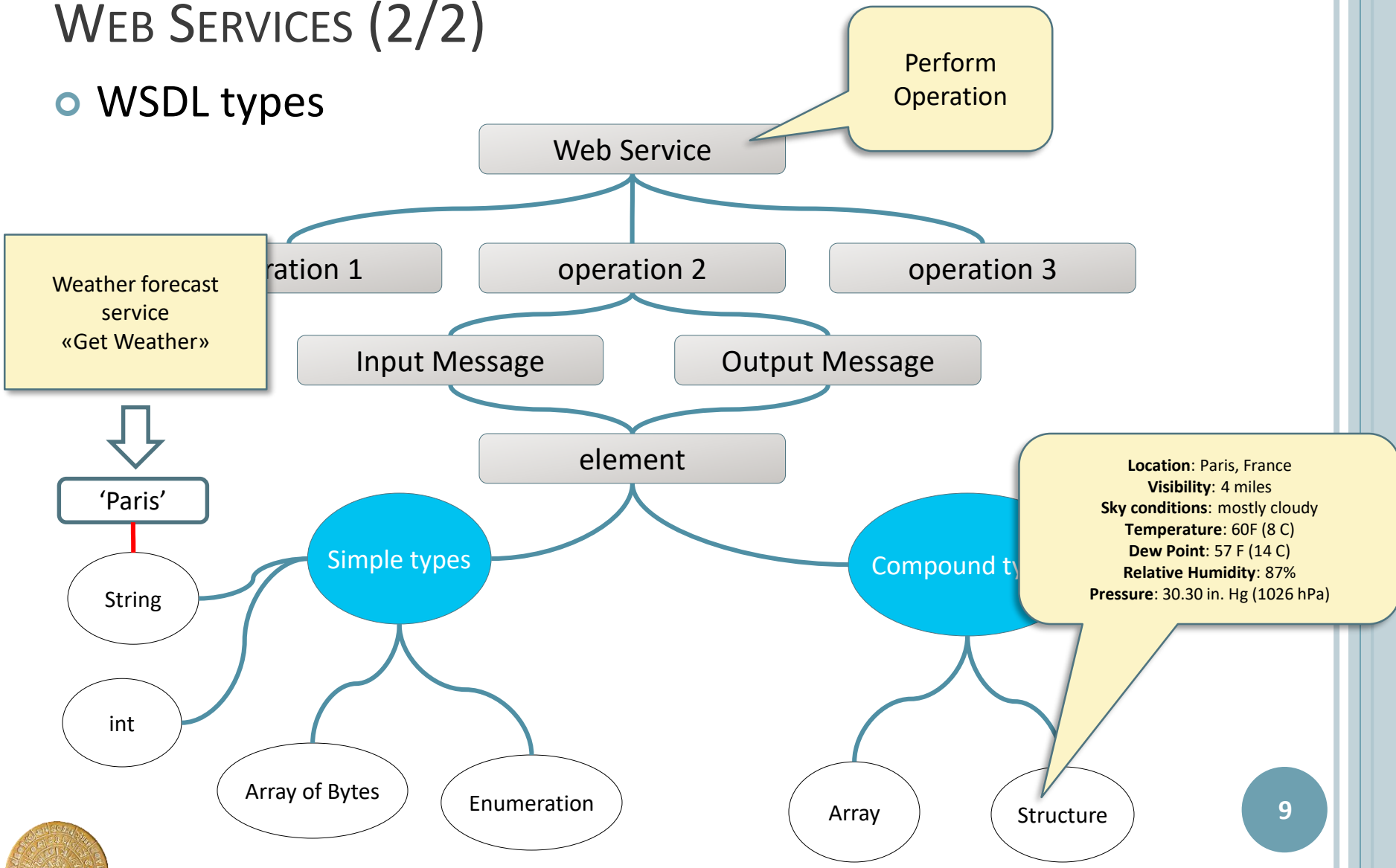
Web Services (1/2)

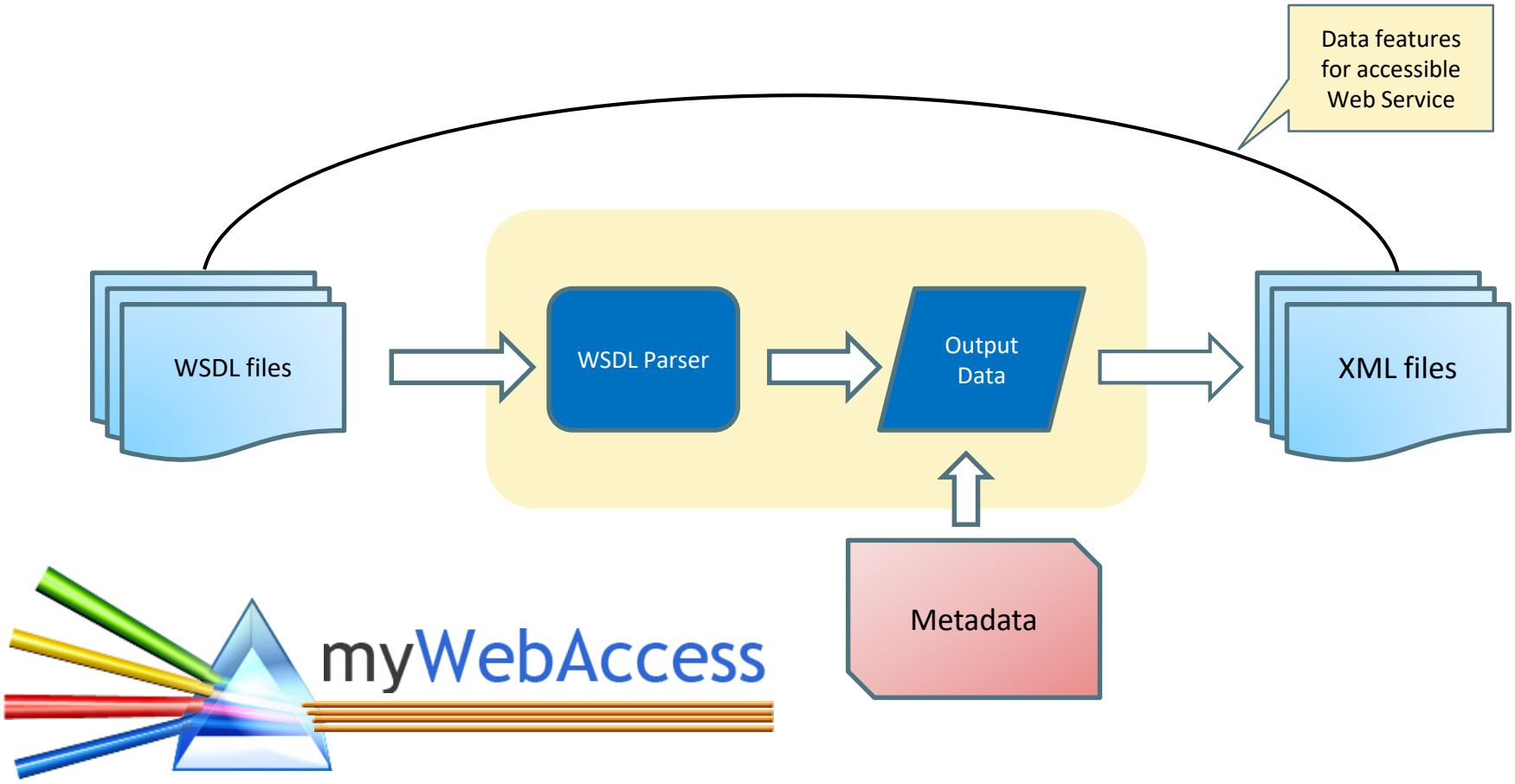
- Can be exploited as component in a web Interface
  - supports application interoperability
  - it uses standards based on the XML language
- Ways to describe the transferred data via a Web Service
  - DTD
  - XML Schema
  - RSS
  - WSDL

Web Services (2/2)

- WSDL types



Creating an accessible Web Service



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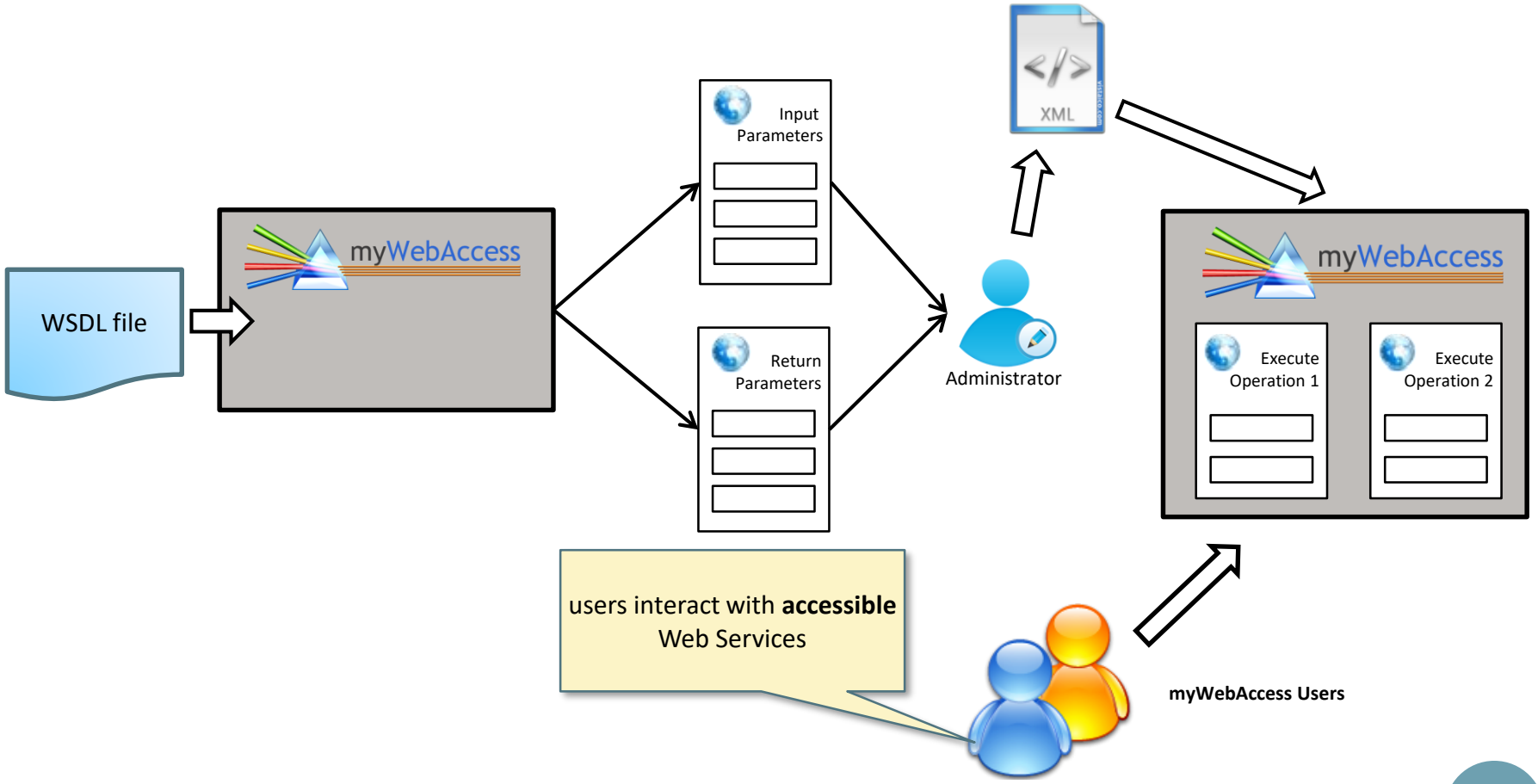
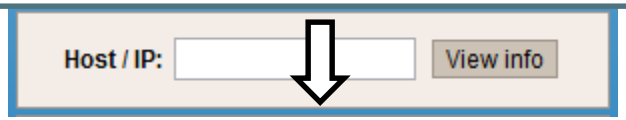
Platform requirements to import Web Services



EXAMPLE

```
<tr>
  <form method="get" id="searchform" action="/en/"></form>
    <td height="40" align="center" valign="middle"><span class="arial_bold">Host / IP:</span>
        <input name="IP" type="text" class="arial" id="IP" value="" size="18">
        <input type="submit" class="btn_sarch" value="View info">
    </td>
</tr>
```




```
<form method="post" action="">
    <fieldset>
        <legend>Insert the values of the operation Get IP Geolocation </legend>
        <div class="ffield">
            <span class="f130">
                <a name="perror_IPAddress" id="xeIPAddress"></a>
                <label for="IPAddress" class="flabel">IP Address:</label>
            </span>
            <span>
                <input type="text" size="30" id="IPAddress" name="IPAddress" value="" class="fstyle">
            </span>
        </div>
    </fieldset>
</form>
```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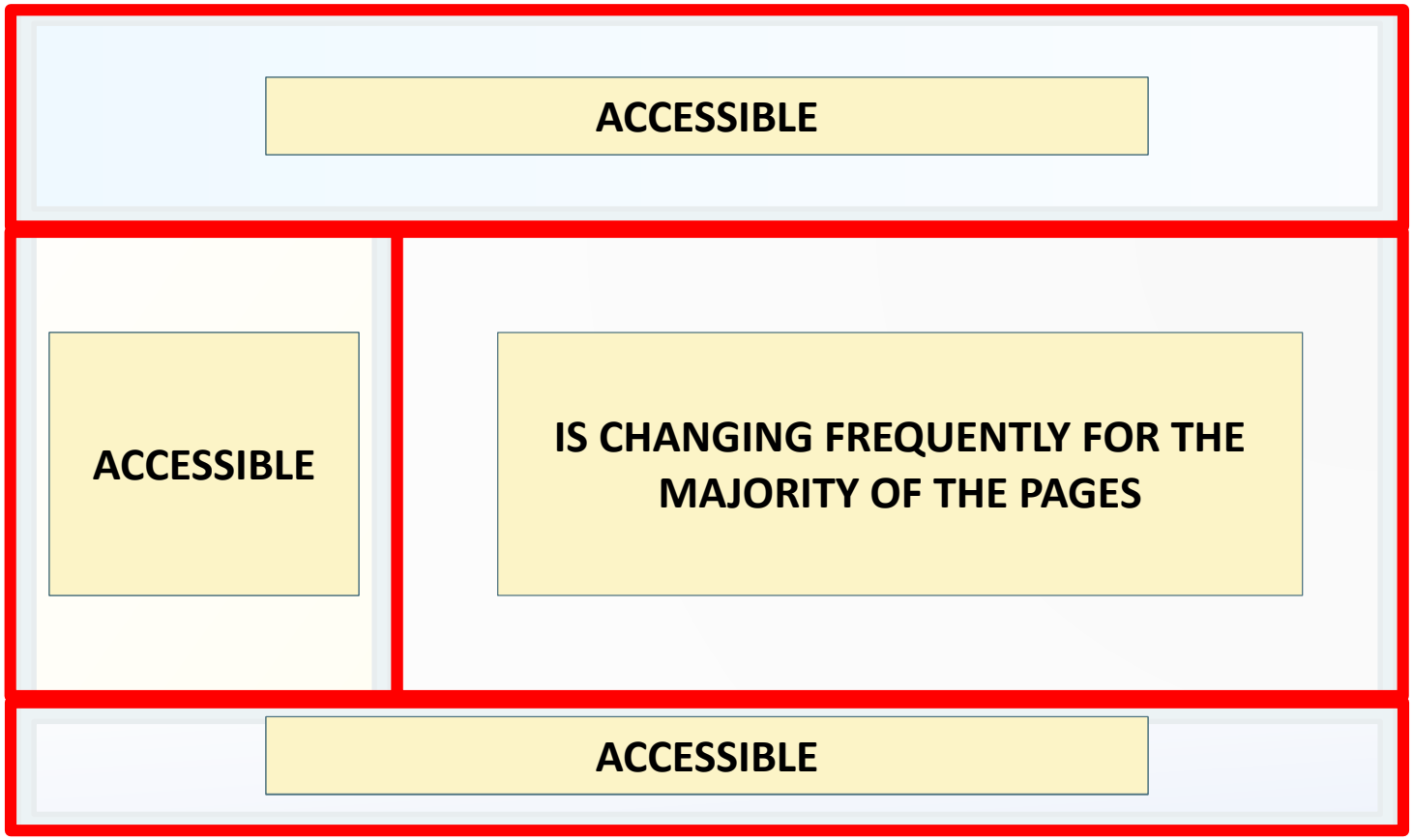
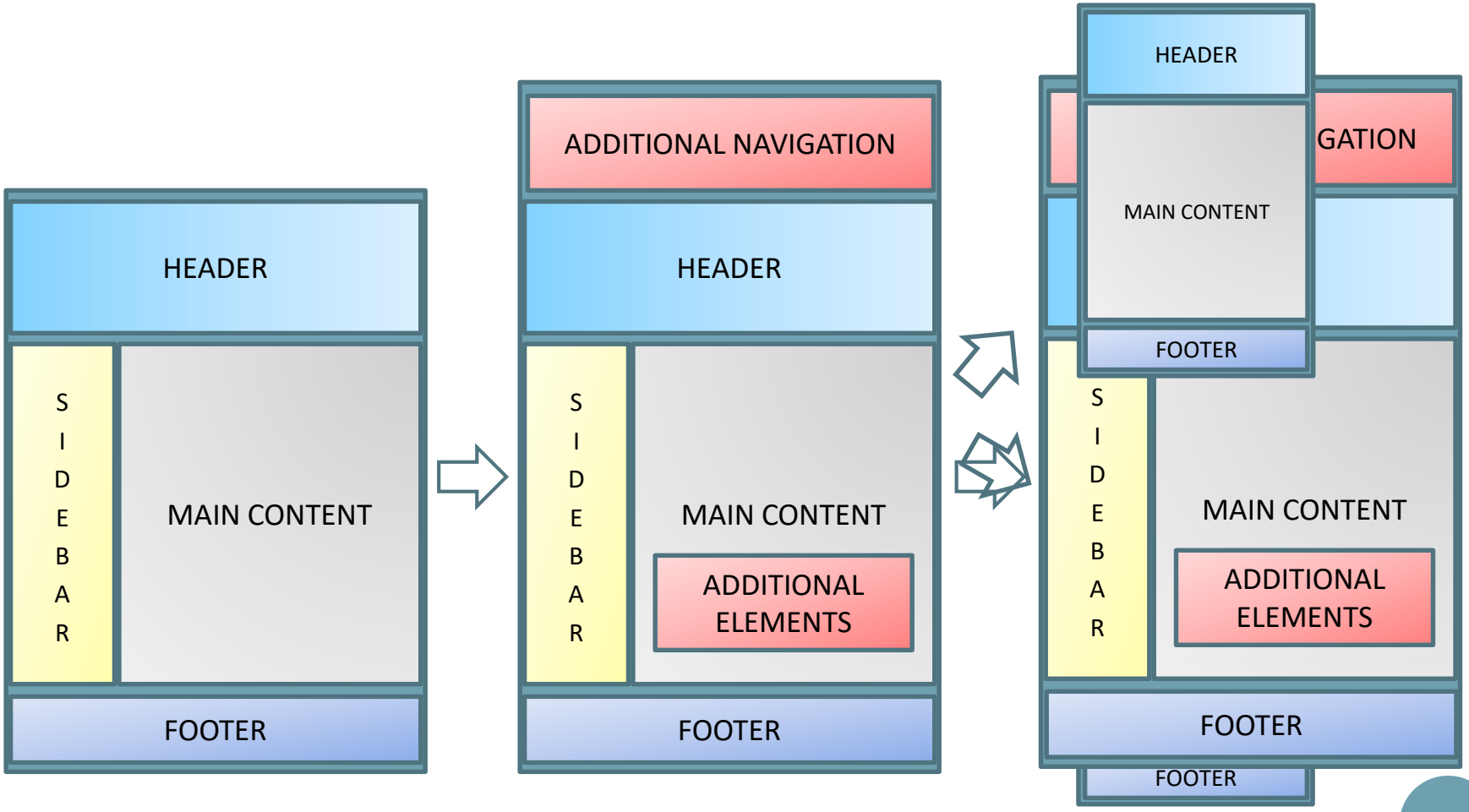
Common followed practice: Website Structure

Specific Structure (4 main areas):

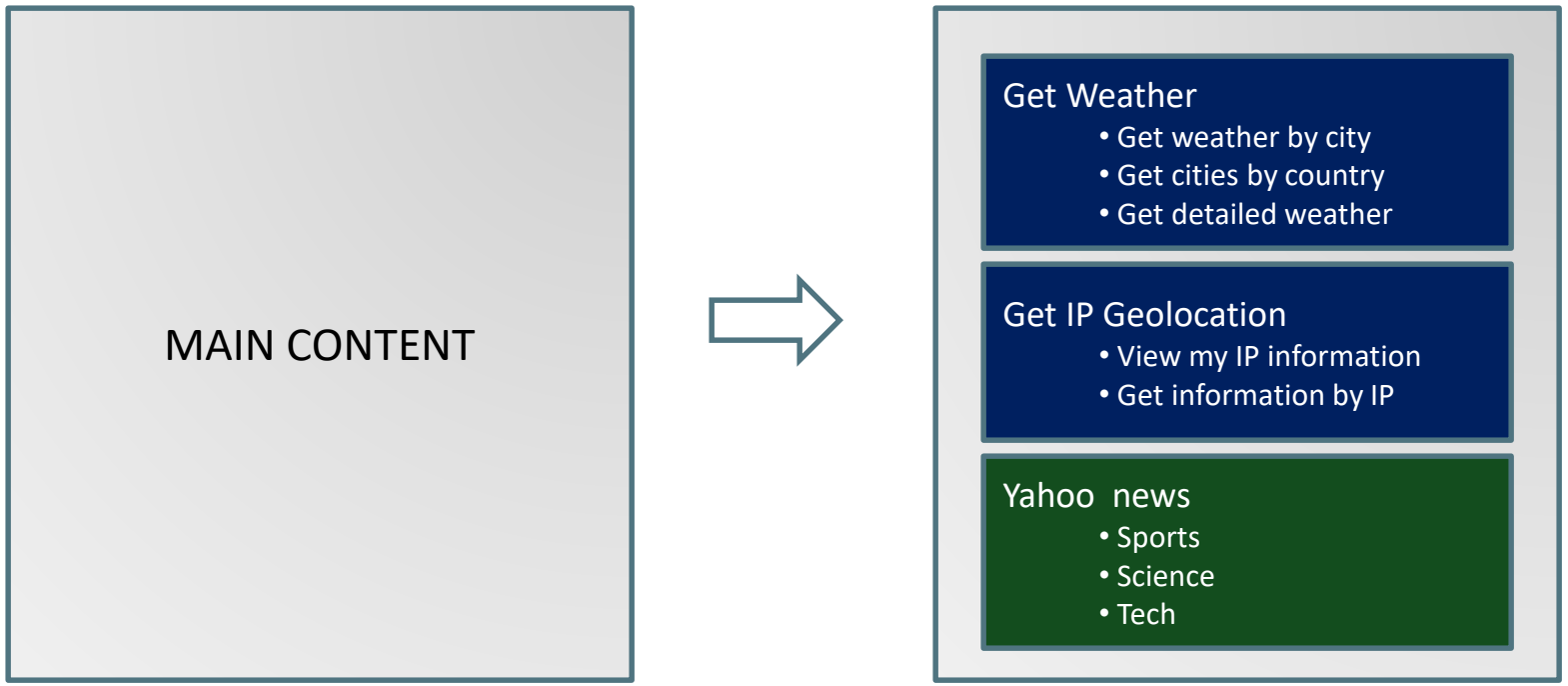


SUPPORT MULTI-CHANNEL CONTENT PRESENTATION



Website main content

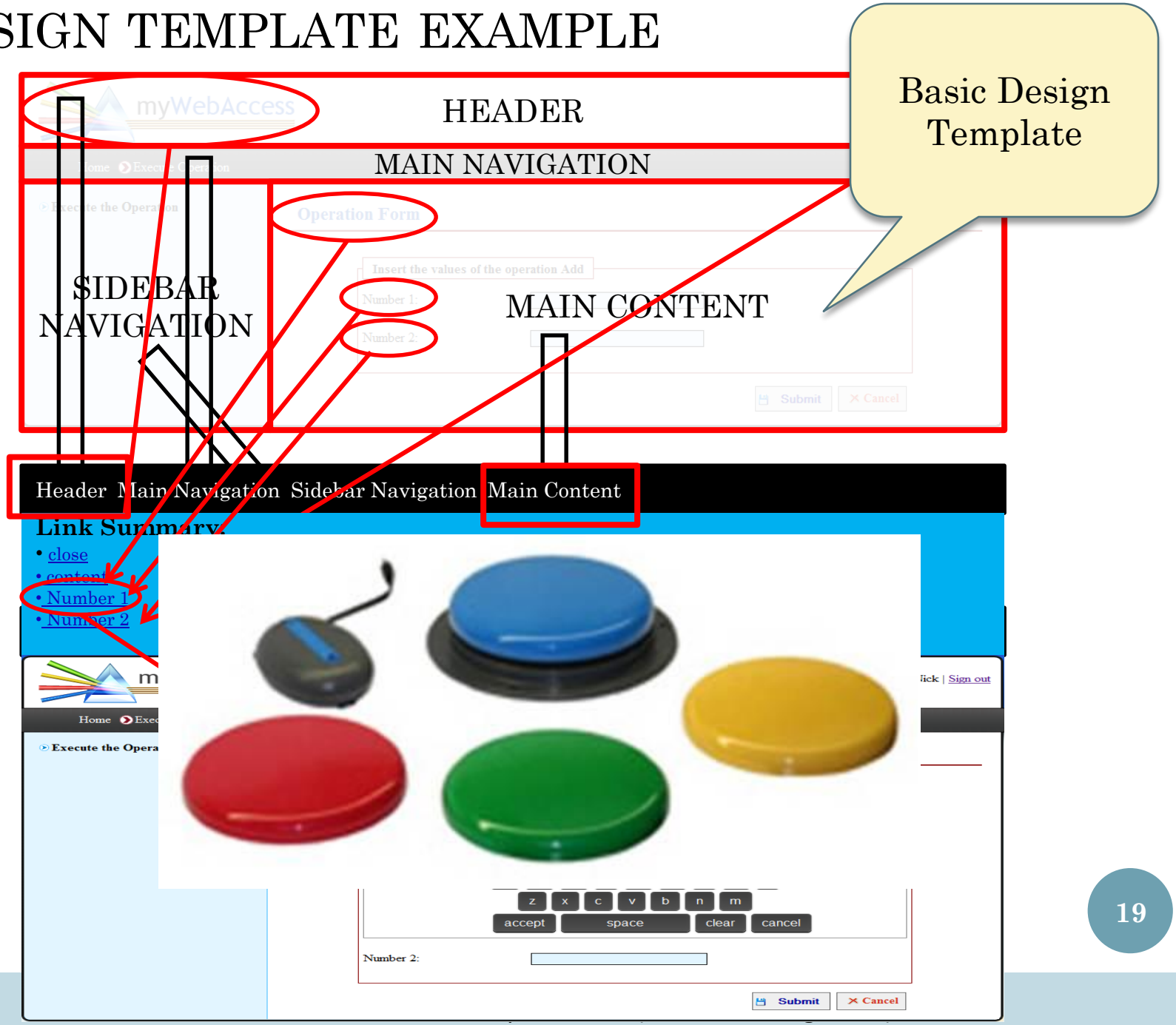
Design the Main Content by exploiting Web Services as components:



myWebAccess Platform

- Adaptation of services at different context of use:
  - support other devices (e.g., mobile phones)
  - blind users
  - users with impaired vision or colour blindness
  - motor impaired users (by providing a virtual keyboard)
- By using design templates
- Model – View – Controller (MVC) platform architecture

DESIGN TEMPLATE EXAMPLE



Related Work

- Web Services accessibility assessment tool
  - assess whether a SOAP or REST web service conforms to the accessibility guidelines
- Easier navigation in a city for motor impaired users by a system based on services
  - from this approach it is clear that in a WSDL standard the accessibility data are limited
- Automatic adaptation of content with systems as proxy
  - BBC service named Betsie (dyschromatopsia users)
  - WebFACE tool (extra features to enhance the accessibility)
  - System for dynamically updating webpages
- Personalized Interfaces
  - E.g., Netvibes, iGoogle, MyYahoo, WebWag, Gritwire

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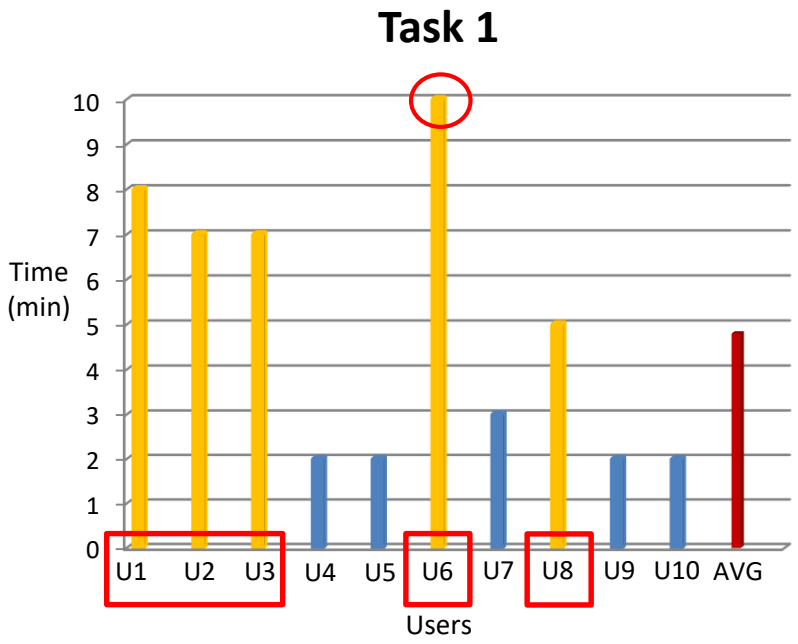
Evaluation

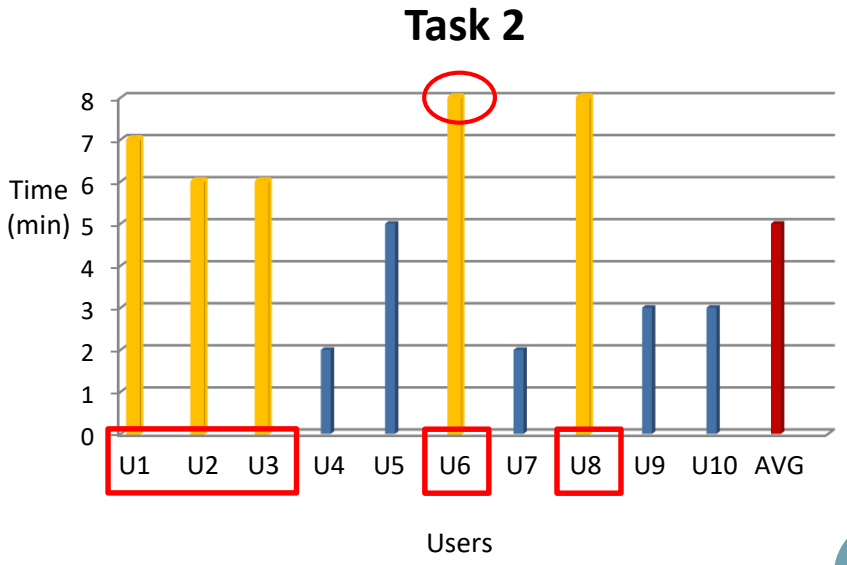
Two methods of Evaluation:

1. Level of compliance by using semi-automated accessibility testing tools
   - All the interfaces have been checked
2. Usability tests
   - Usage scenario followed by 10 different users
   - Compute required time and number of errors

USABILITY TESTS

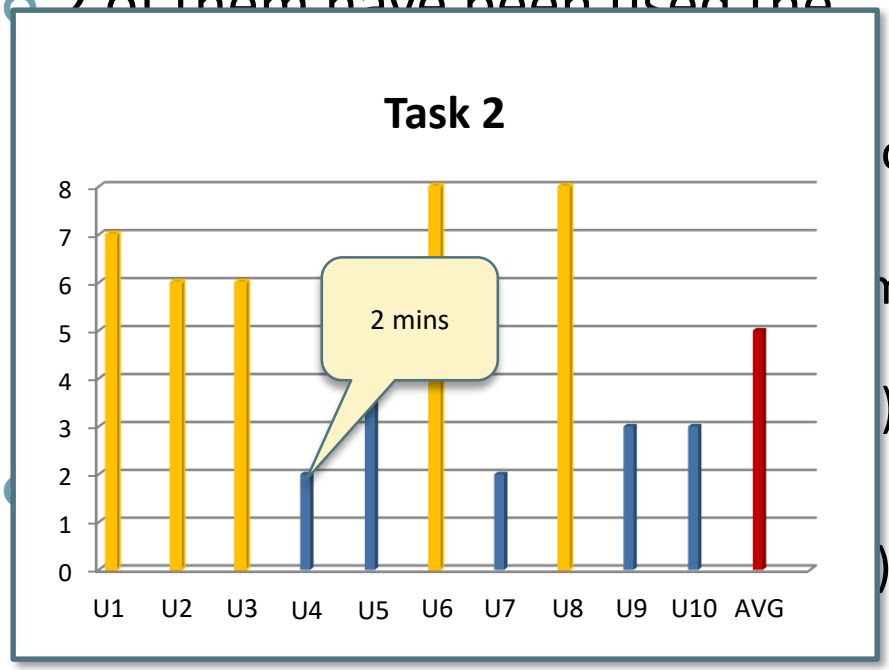
- 10 users (5 of them have been used the screen reader)
- Results
  - All users completed the scenario within an acceptable period of time.
  - Users that used the screen reader were slower compared to the rest





USABILITY TESTS

- 2 of them have been used the



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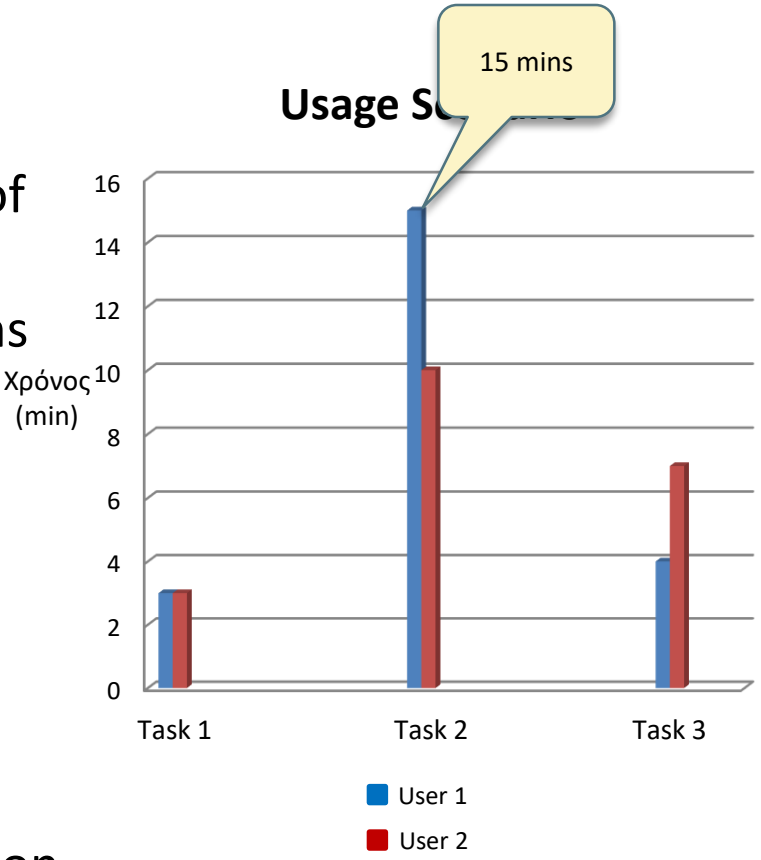

- The completion time of the usage scenario in compared to an experienced user vary depending on the difficulty level (2x – 10x)

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Further Research

- Exporting to a script with XHTML valid markup by taking the metadata from the existing WSDL and XML files
- The ability to exploit REST type web services
- Further exploitation of the Semantic Web and Semantic Web Services towards a more comprehensive solution that means transition from the WSDL standard, to a standard with Semantic information
- Including the Accessible Rich Internet Applications Suite (WAI ARIA) to improve the interaction via assistive technology
- Creating different **registries** of “repaired” services by leveraging QoS aspects to support varied disability requirements

Demo - Download

- http://arles.rocq.inria.fr/mywebaccess
- Demo for each user category:
  - Platform administrator
  - Simple user
  - Visual impaired user
  - Motor impaired user
  - Mobile user
- Use by the web developers:
  - Use the mechanism for adding third-party web services
  - Utilize the already "repaired" web services in different context of use
  - Create your own template

THANK YOU!

http://arles.rocq.inria.fr/mywebaccess