Part I: sketching web applications

1. Seven good characteristics of a good sketch:

1. clear vocabulary and distinct gesture:
2. minimal details and appropriate refinement:
3. suggest and explore, rather than confirm
4. ambiguous
5. quickly and timely
6. inexpensive and disposable
7. plentiful

2. Name of two sketching tools: Lovely Charts, Cacoo, Mockingbird, Lumzy, Mockflow

3. Which application?

4. Six user-centered design questions:

1. Who are the users of the service? (Audiance: who are your users?)
2. What are the users' tasks and goals? (General goal and tasks)
3. What functions do the users need from the service? (Detailed functionalities)
4. What are the user's experience levels with services like this one? (Experience level of the user in similar services)
5. What information might the user need, and in what form do they need it? (Documentation/assistance to use the service)
6. How do users think the service should work? (Utilisability)

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Part II: Developing Rich Web Applications:

1. The Web of Documents:

a. Acronyms:

- **HTML (HyperText Markup Language)**
  It is the Web's core language. **What**, **how** data to present and tells how to make document **interactive** through links and scripts.
- **XML (Extensible Markup Language)**
  It's a **markup** language that defines a **set of rules** for encoding documents in a format which is both human-/and machine-readable.
- **CSS (Cascading Style Sheet)**
  It's is a stylesheet language used for describing the presentation of document written in a markup language:
  - parameterize HTML document with style rules
  - how to represent structural elements (headings, paragraphs, links)
  - define fonts, weight, colors, spacing….

b. Code snippets:

- **HTML5**
  - <html>
    <head>
    <title>Mini HTML example </title>
    </head>
    <body>
    Hi there! (no closing needed)
    </body>
    </html>
- **XML**
  - <note>
    <to>Alice</to>
    <from>Bob</from>
    <heading>Reminder</heading>

<body>Don’t forget me this WE!</body>
</note>

- **CSS**
  - <style>
    article {
    position: relative;
    margin: 0 0 0 0;
    padding: 0 0 0 0;
    }
    </style>

2. Six structural constructs introduced by HTML5

- <header>
- <footer>
- <nav>
- <article>
- <section>
- <aside>

3. Four new key API features provided by HTML5

- file API, form API, geolocation, contact API, user timing API, drag & drop

4. Three technologies to add semantics to document for search engine

- RDFa, microformat

5. Give the name of the common vocabulary that all major search engines support when indexing web documents

-> Schema.org provides a collection of shared vocabularies **(schemas)** webmasters can use to mark up their pages in ways that can be understood by the major search engines: Google, Microsoft, Yandex and Yahoo!

6. What is the name of new HTML5 element that enable to inject dynamically some content? Explain how it works?

-> Canvas: it provides a method named DrawImage which let you inject the content of a DOM element into the Canvas.

7. Advantage of using web storage over HTTP session cookies

- with a greatly enhanced capacity (no 4KB limit)
- no information stored in the http request header

8. How can you make the web application responsive

```
<meta content="width=device-width, initial-scale=1.0">
```

Using relative width value.

9. What are the main video codecs and container formats that will be used in HTML5 web pages? What was the main problem regarding to browser support of these formats?

- Media containers: MPEG 4 (extension .mp4), Ogg (extension .ogg), AVI (extension .avi), Flash video (extension .flv), Matroska (extension .mkv; .webm)
- Media codecs: MPEG 4, H.264, Theora,VP8
- Specific browser does not support all media codes, that leads to incompatibility when you try to open video on different browser.

10. a) <video>
<source src=”www.youtube….mp4“ type=”video/mp4”/>
<source src=”www.youtube….ogg“ type=”video/ogg”/>
<source src=”www.youtube….3gp“ type=”video/3gp”/>
</video>

b) <video controls loop autoplay>

c) The video is played from 35 to 72s

Media fragment: URIs - temporal fragments

11. Explain briefly what AJAX is and how it works?

- AJAX means Asynchronous JavaScript And AML. The important keyword here is 'Asynchronous'. The Javascript code of the page continues its execution while the request is set.

Principle of AJAX:

- User action (click, modify, load st) create HTTP request which takes form of JAVASCRIPT and call to the AJAX engine.
- AJAX engine will communicate with server, make those request asynchronous without stalling user's interaction in app. After retrieve response, AJAX will modify DOM and update the page

12. Explain what the function work?

- Function 1:

Get the video object with index 0 by tag name
Set the source for the video
Load the video

- Function 2:

Get the video object with index 1 by tag name
Set the current time of the video to 12 (jump to 12s)

- Function 3:

Get the video object with index 2 by tag name
Rotate the video 45 deg

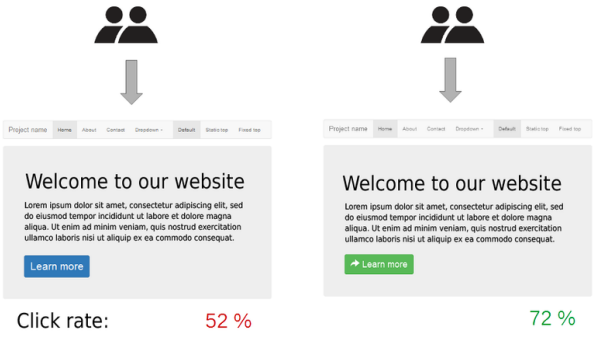
Part III: Evaluating web application

1. 4 Technique for usability design:

- Usefulness: address the real needs of users.
- Consistency: within an application (or a suite of applications), make sure that actions, terminology, and commands are used consistently.
- Simplicity: eiminate any unnecessary or irrelevant elements.
- Communication: Provide appropriate, clear, and timely feedback to the user so that he sees the results of his actions and knows what is going on with the system.
- Error Prevention and Handling: prevent the user from making serious errors whenever possible, and ask for user confirmation before allowing a potentially destructive action.

2. Basic rules for Erononomy:
    - Consistency: Users should not have to wonder whether different words, situations, or actions mean the same thing (keep nature characteristic)
        - Ex: user find menu, it usually on top the page. The form have description above and filling space below
    - information feedback: give user the response from their action
        - inform to assure user: long process -> use clock (copy something in OS), button pushed -> change color
        - inform to avoid mistake: show error, warning
        - inform to help memorize: type documents -> need a place to show it
    - concision: minimize the need to exchange
        - macro command, short-cut -> quick way to do the task
        - default values in form
    - error management:
        - avoid error: inform, ask user for deleteion
        - warning error: give the reason
        - correct error: undo function, indications
3. Licker scale: satisfaction measures
    - 1-> 5: unsatisfied -> very satisfied

4. A/B test: compare 2 version of the page and determine which one is better by showing the 2 variance of the web page randomly to user and use statistically analysis to see which is better. Tool: PLANOUT



5. T test: statistically test, we test whether the means of two groups are statistically different from each other
    a. Example: list of time necessary to finish tasks from system A or system B. Check they are reliably different.
    b. Example: we have sample of number of errors of each user receives. We want to check whether we can achieve less than 15 errors for any user with confidence 90%
6. Web app: search engine, give lists of information about topic you are interested/ query on different field.

- Main innovation:
    - feature search which propose some recommendation to user profile.
    - Using different scale of image to show image in grid: innovative and delightful
    - Feedback button always on the right of website: convenient and supportive
- Use some method that we mention above (A/B test, user feedback)