POLISH-JAPANESE ACADEMY OF INFORMATION TECHNOLOGY

Content Management Systems (CMS)

Lecture 15: Content Management in Web 2.0/Web 3.0

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Agenda

- Introduction

- Web 2.0

- Web 3.0

- Interesting systems / services / portals

- Web 4.0 i 5.0

- Summary

Materials form Wikipedia.org, especially from Web 2.0, Web 3.0.

Web 2.0

Source: http://en.wikipedia.org/wiki/Web_2.0

Web 2.0 (2)

- *Tim O'Reilly (creator of this concept and founder of O'Reilly): Web 2.0 is a business revolution in the computer industry caused by treating the Internet as a platform and trying to understand the sources of success on it.*

- *Dario de Judicibus (IBM): Web 2.0 is a knowledge-driven environment where human interaction generates content that is published, managed, and used in web applications in a service-oriented architecture.*

Web 2.0 (3)

- Stephen Fry (British Guardian):
  - *an idea in people's heads rather than a reality. It's actually an idea that the reciprocity between the user and the provider is what's emphasized. In other words, genuine interactivity, if you like, simply because people can upload as well as download.*

- It can also signify / divert the passage from the "passive" to "active" user: users create content themselves - the social element.

Web 2.0 - phenomena

- Folksonomy (*collaborative tagging, social classification, social indexing, social tagging*) – to describe content. Unlike the classic "indexing" can be done by content recipients (real people).

- Platform - The Internet has become a heterogeneous platform for launching services and applications.

Web 2.0 – phenomena (2)

- Network effect - the acquisition of a good (or service) by a person brings benefits to other people using the service.
- ~~Perpetual beta~~ - the system or services are constantly evolving and therefore never leave the beta phase. The phenomenon is related to the relevant technology, business model, etc. For obvious reasons should not be used in business applications.

Web 2.0 – phenomena (3)

- Cloud computing
  - The ability to work from any computer having web browser in the world,
  - We generally have more computing power from multiple machines,
  - We avoid all kinds of problems with the compatibility and configuration of local hardware,
  - Our data is duplicated (replicated), so more resistant to potential hardware failures.

Web 2.0 – phenomena (4)

- *Mashup*. Publish aggregated content from multiple sources, such a:
  - cartography with Google Maps,
  - real estate from Craigslist.
- Blogs. Entries on various topics.
  - Initially, they had the character of a diary,
  - Very often they take the form of a guide/tutorial.
- Vlogs - a video blog or video log.

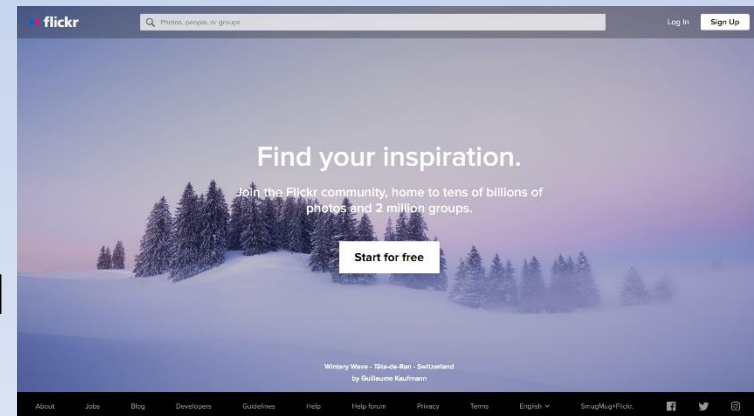# Which businesses / services meet the Web 2.0 criteria?

- Level 3.
  - There are available only online,
  - Their effectiveness comes from the cooperation of many people and the network effect,
  - Their strength and quality of service increases with the number of users
  - eBay/Allegro,
  - Wikipedia,
  - OLX,
  - Skype,
  - AdSense.

Tim O'Reilly

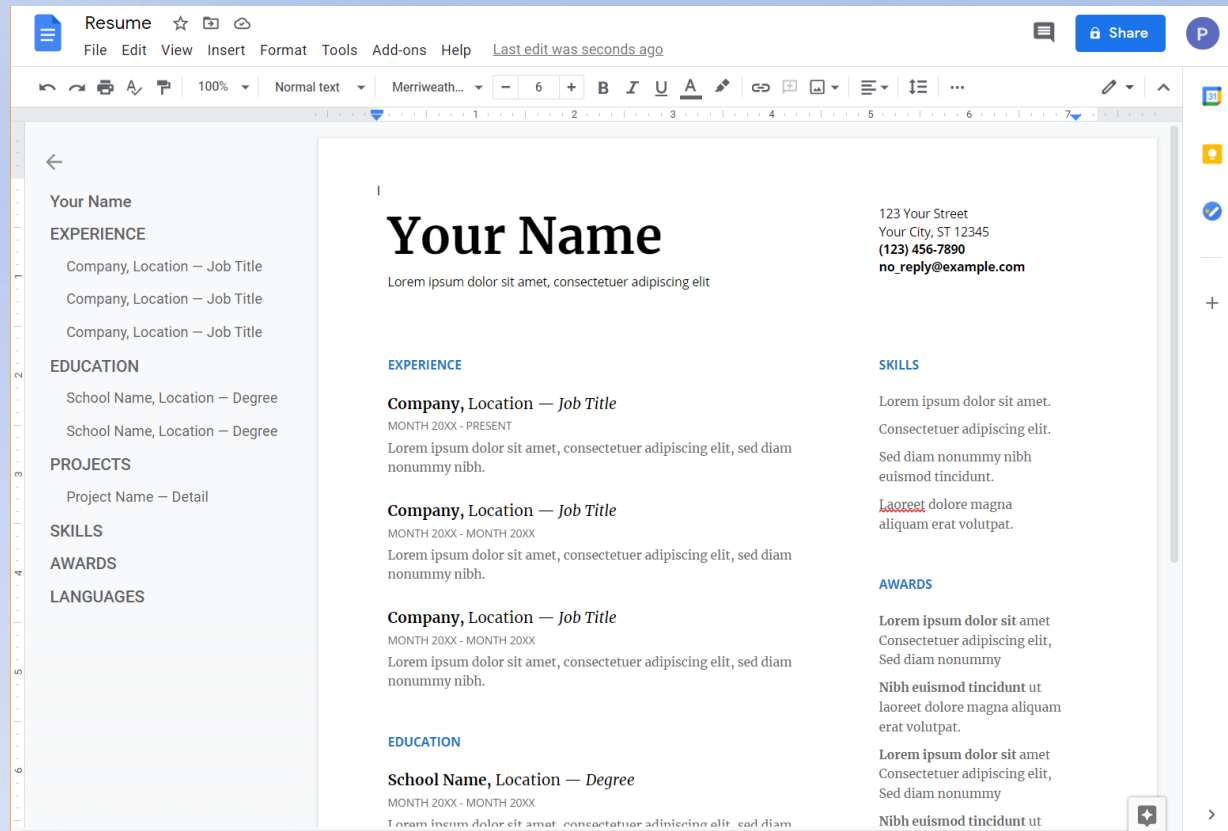# Which businesses / services meet the Web 2.0 criteria (2)

- Level 2.
  - They can work without Internet access, but to a limited extent.
  - [Flickr](#) – uses:
    - a shared photo database (and photos), created by the community tag base.
    - Huge popularity:
      - 4 631 photos uploaded in the last minute ·
      - 558 832 photos tagged with urban ·
      - 2.3 million photos geotagged this month

Tim O'Reilly

Which businesses / services meet the Web 2.0 criteria (3)

- Level 1.
  - Businesses / services operating without a network (but gaining new opportunities in the network).
  - [Google Docs & Spreadsheets](#)

Tim O'Reilly

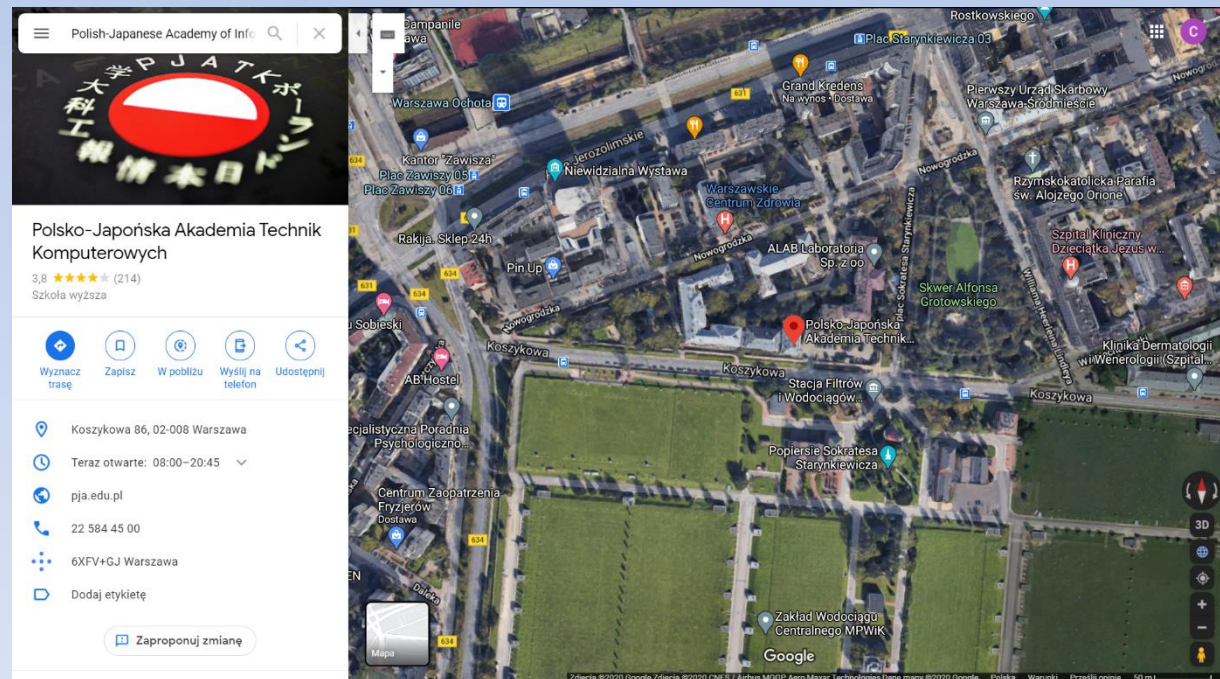# Which businesses / services meet the Web 2.0 criteria (4)

- Level 0
  - Companies / services that can operate completely without cooperation within the community.

  - [MapQuest](),

  - [Yahoo! Local](),

  - [Google Maps]().

Tim O'Reilly

Web 2.0 - capabilities

- Access to content (as in "Web 1.0"),
- Applications in a browser window, including:
  - **Operating systems** based entirely on the web.
    - **os-js.org**
    - EyeOS (work terminated)
    - Glide OS (work terminated)
    - G.ho.st (work terminated)
    - Online OS (work terminated)
    - YouOS (work terminated)

Web 2.0 – capabilities (2)

- Users can store their own data on web servers.

- Share your own data with other users. In most cases, this is beneficial to both parties.

- Creating a community (one of the basics of Web 2.0).

Web 2.0 – capabilities (3)

- Better (more intuitive) Graphical User Interface (GUI), mostly based on technology such as:
  - JavaScript/TypeScript,
  - HTML5 + CSS3.
- Blogs (Weblogs).

Web 2.0 - technology

- GUI mostly based on JavaScript, HTML5 and CSS3 (AJAX),
- Valid HTML5 and CSS3 (formerly XHTML and HTML).
- Folksonomies - tags entered by users and displayed, e.g. in the form of a cloud.

Web 2.0 – technology (2)

- Cascading Style Sheets 3 (CSS3) – makes it easy to separate the presentation layer from the content (responsive layout).

- Communicate mostly with JSON or various forms of XML (e.g. SOAP).

- API based:

  o REST (*Representational State Transfer*) and JSON (JavaScript Object Notation).

  o *Web Services* and SOAP.

Web 2.0 – technology (3)

- Aggregate content from multiple sources. Usually, RSS or Atom feeds are used for this purpose.

- Components for hosting wiki and / or web forums, e.g. Disqus (privacy concern, owner of the data).

- Special protocols
  - FOAF (Friend of a Friend),
  - XFN (XHTML Friends Network), e.g.
    ```
    <a href=http://jimmy.examples.com/
    rel="colleague">John Smith</a>
    ```

Web 2.0 – technology (4)

- Microformat ([microformat, μF lub uF](#))
  - Approach to data formatting to use some of them as metadata, using only HTML.
  - As a result, information for users can be automatically processed.
  - The current formats allow you to describe:
    - Events
    - Contact information,
    - Interpersonal relationships, etc.

Web 2.0 – technology (5)

- Microformat ([microformat, µF lub uF](#)) – *continued*
  - Default support in next-generation browsers:
    - Chrome
    - MS Internet Explorer/Edge
    - Mozilla Firefox
  - To some extent, it is a partial implementation of the *semantic web* concept.

Web 2.0 – technology (6)

- Microformat (microformat, µF lub uF) – *continued*
  - h-adr
  - h-card
  - h-entry
  - h-event
  - h-feed
  - h-geo
  - h-item
  - h-listing
  - draft
  - h-product
  - h-recipe
  - h-resume
  - h-review
  - h-review-aggregate

Źródło: *http://microformats.org/*

Web 2.0 – technology (7)

- Schema.org promoted by Google, Microsoft, Yahoo and Yandex:
  - **several hundred** types of information, incl.
    - *CreativeWork, Book, Movie, MusicRecording, Recipe, TVSeries,*
    - *AudioObject, ImageObject, VideoObject,*
    - *Event,*
    - *Health,*
    - *Organization,*
    - *Person,*
    - *Place, LocalBusiness, Restaurant,*
    - *Product, Offer, AggregateOffer,*
    - *Review, AggregateRating.*

Source: https://schema.org/

Web 2.0 – technology (8)

- Schema.org – example no 1

```
<div itemscope itemtype="http://schema.org/Movie">
  <h1 itemprop="name">Avatar</h1>
  <div itemprop="director" itemscope
       itemtype="http://schema.org/Person">
  Director: <span itemprop="name">James Cameron</span>
       (born <span itemprop="birthDate">August 16, 1954</span>)
  </div>
  <span itemprop="genre">Science fiction</span>
  <a href="../movies/avatar-theatrical-trailer.html"
       itemprop="trailer">Trailer</a>
</div>
```

Source: https://schema.org/docs/gs.html

Web 2.0 – technology (9)

● Schema.org – example no 2

```
<div itemscope itemtype="http://schema.org/Offer">
  <span itemprop="name">Blend-O-Matic</span>
  <span itemprop="price">$19.95</span>
  <div itemprop="reviews" itemscope
      itemtype="http://schema.org/AggregateRating">
    <img src="four-stars.jpg" />
    <meta itemprop="ratingValue" content="4" />
    <meta itemprop="bestRating" content="5" />
    Based on <span itemprop="ratingCount">25</span> user
      ratings
  </div>
</div>
```

Source: https://schema.org/docs/gs.html

Content management

25

Web 2.0 and bussiness

- The basis is mostly the cooperation of users on a very large scale.
- *Economics* → *Wikinomics*
  - Openness
  - Co-operation on equal terms (peering)
  - Sharing
  - Globalization
- Companies can create products in collaboration with customers.
- Cost reduction

Web 2.0 - problems / criticism

- Some users may use the work of other people involved in social networking. Practically no good ways to counter this phenomenon.
- Web 2.0 does not represent a completely new Web, but rather an extension of what exists. This also applies to the technology used, e.g. AJAX runs on the HTTP header.

Web 2.0 - problems / criticism (2)

- User collaboration has been known before, for example, Amazon allows user reviews since 1995, and released its API in 2002.
- No clear definition / criteria.

Web 3.0

- It will start…
  - When?
  - What will it mean?
- Tim Berners-Lee (creator of the Web):

  I think maybe when you've got an overlay of scalable vector graphics - everything rippling and folding and looking misty - on Web 2.0 and access to a semantic Web integrated across a huge space of data, you'll have access to an unbelievable data resource.

Web 3.0 (2)

- Eric Schmidt (CEO, Google)

  But if I were to guess what Web 3.0 is, I would tell you that it's a different way of building applications... My prediction would be that Web 3.0 will ultimately be seen as applications which are pieced together. There are a number of characteristics: the applications are relatively small, the data is in the cloud, the applications can run on any device, PC or mobile phone, the applications are very fast and they're very customizable. Furthermore, the applications are distributed virally: literally by social networks, by email. You won't go to the store and purchase them... That's a very different application model than we've ever seen in computing.

Web 3.0 (3)

- Jerry Yang (founder and CEO of Yahoo):

  Web 2.0 is well documented and talked about. The power of the Net reached a critical mass, with capabilities that can be done on a network level. We are also seeing richer devices over last four years and richer ways of interacting with the network, not only in hardware like game consoles and mobile devices, but also in the software layer. You don't have to be a computer scientist to create a program. We are seeing that manifest in Web 2.0 and 3.0 will be a great extension of that, a true communal medium...the distinction between professional, semi-professional and consumers will get blurred, creating a network effect of business and applications.

Web 3.0 (4)

- Reed Hastings (Founder and CEO of Netflix; It used to be the largest online movie rental delivered by mail: 90 thousand titles, 6.7 million customers, 55 million disks, shipped 1.6 million disks per day, spent 300 million USD per shipment, exceeded 1 billion shipments):

  Web 1.0 was dial-up, 50K average bandwidth, Web 2.0 is an average 1 megabit of bandwidth and Web 3.0 will be 10 megabits of bandwidth all the time, which will be the full video Web, and that will feel like Web 3.0.

Web 3.0 - possibilities and phenomena

- Transform Web into a giant database (Data Web).
  - Structured data formats such as XML, RDF, microformats.
  - Dedicated query language, such as SPARQL.
    - "Somewhat" strange syntax, referring to RDF
    - Enables searching in RDF databases on the Internet.
  - The first step on the road to transformation into a full *Semantic Web*.

Web 3.0 - possibilities and phenomena (2)

- Transform Web into a giant database (Data Web) - continued

```
PREFIX abc:
<http://example.com/exampleOntology#>
SELECT ?capital ?country
WHERE {
  ?x abc:cityname ?capital ;
     abc:isCapitalOf ?y.
  ?y abc:countryname ?country ;
     abc:isInContinent abc:Africa.
}
```

It seems that such attempts have already been and for many reasons failed. Will it be different now?

Web 3.0 - possibilities and phenomena (3)

- Create artificial intelligence (AI) that will be able to think in human ways.
  - Some companies (such as IBM, Google) are researching data mining technologies that can predict, for example, music hits (based on music databases).
  - The origin of this "intelligence":
    - New computer systems,
    - Collective intelligence of people using the services.

Such revolutions have already been announced - will it change now? We'll see …

Web 3.0 - possibilities and phenomena (4)

- **Semantic Web**
  - The content on the Internet will be stored and processed using some algorithmic structures (not the natural language as before), e.g.
    - RDF - Resource Description Framework.
    - RDF Schema
    - OWL - Web Ontology Language

Given the vastness of the Internet, the diversity of content and their providers, you can have reasonable doubts whether this will work.

Web 3.0 - possibilities and phenomena(5)

- Semantic Web – *continued*
  - This means that special software (e.g. agents) will be able to "understand" the data contained therein, which will greatly facilitate their search, sharing, etc.

Given the vastness of the Internet, the diversity of content and their providers, you can have reasonable doubts whether this will work.

Web 3.0 - possibilities and phenomena (6)

- Evolution in 3D ([Web3D Consortium](#))
  - Evolution in 3D (Web3D Consortium)
  - Web will take the form of many, different three-dimensional locations.
  - This will create new ways of working between users.
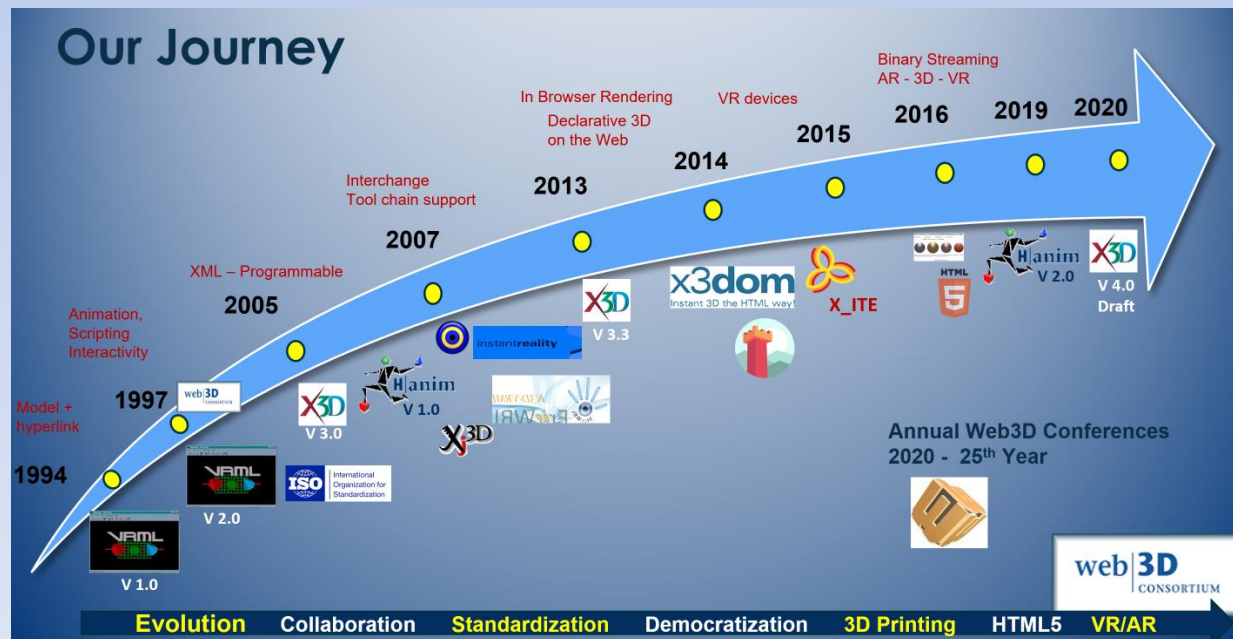
3D technology is certainly attractive, but is it always effective? It certainly gives you a lot of new possibilities …

Web 3.0 - possibilities and phenomena (7)

● Evolution in 3D – *cont.*

    ○ Second Life game role:

        • Chat

        • Avatars

Web 3.0 - possibilities and phenomena (8)

- Web will become a platform for launching applications:
  - Users will be able to easily create their own applications,
  - Of course, this also applies to resources, data, etc.
- Unlimited interoperability of various hardware and software platforms.

These directions seem quite likely. Of course there is no certainty as to how very universal solutions can be created (and by whom) ...

Web 3.0 - possibilities and phenomena (9)

- Intensive, seamless exchange of data between them.

- [OpenID](). A universal way to handle a single identity across the Internet.
    - o Other popular services,
    - o Privacy.

- Personalization of Internet access,
    - o social platforms

Web 3.0 – Metaverse

- Significant changes to the user interface, including *Virtual Reality (VR), Augmented Reality (AR),*

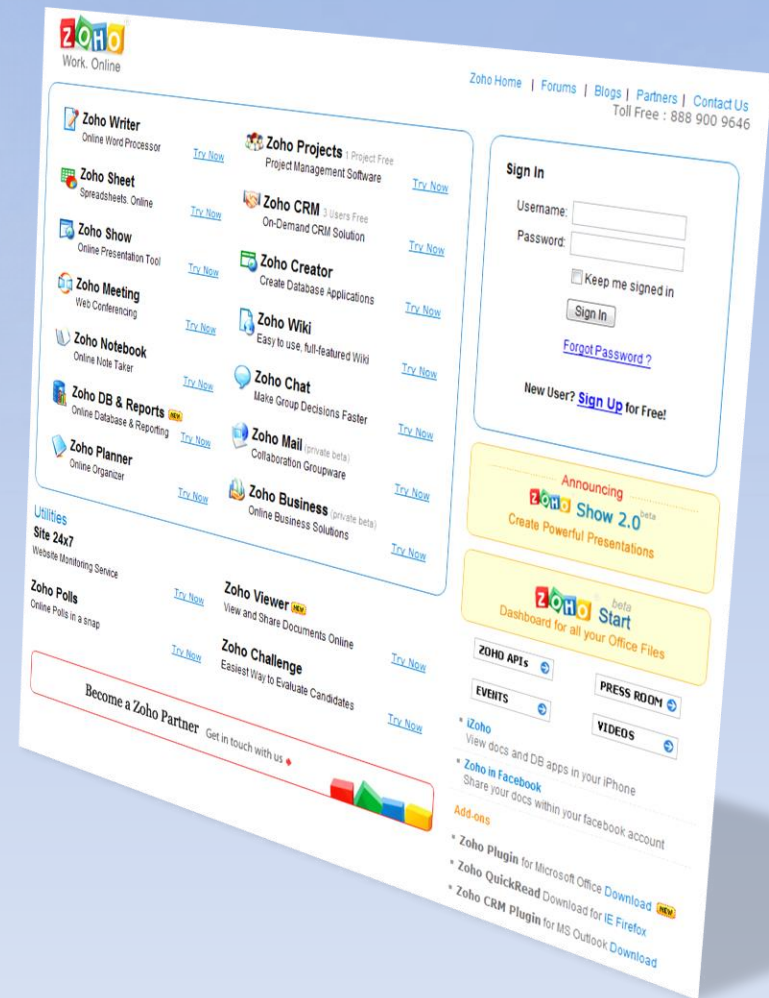- efficiency and the effectiveness of such GUI changes, e.g. shopping in a VR store.

Source: CoinDesk

Source: Meta

Interesting systems of Web 2.0 / 3.0

- [Zoho](). Set of on-line applications:
  - text editor
  - spreadsheet
  - presentations
  - teleconferences
  - notes
  - organizer
  - project management
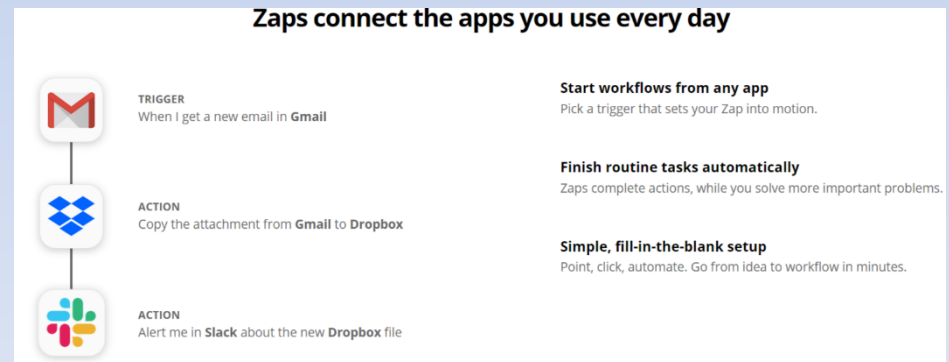 - CRM
  - database
  - Wiki
  - chat
  - group work

Interesting systems of Web 2.0 / 3.0 (2)

- **IFTTT** (*If This Then That*). Perform different actions depending on the fulfillment of the definable conditions.
- **Zapier** – same as above.

Web 4.0 and 5.0

- Regardless of the definition and scope of Web 2.0 / 3.0, some people introduce the terms:
  - Web 4.0
    - mobility,
    - personalization,
    - artificial intelligence,
  - Web 5.0
    - emotionality,
    - connecting devices with people so that feelings can be recognized.

Some of them were supposed to appear in earlier versions 😄

Social factor in web development

- We can check to what extent the predictions are correct …
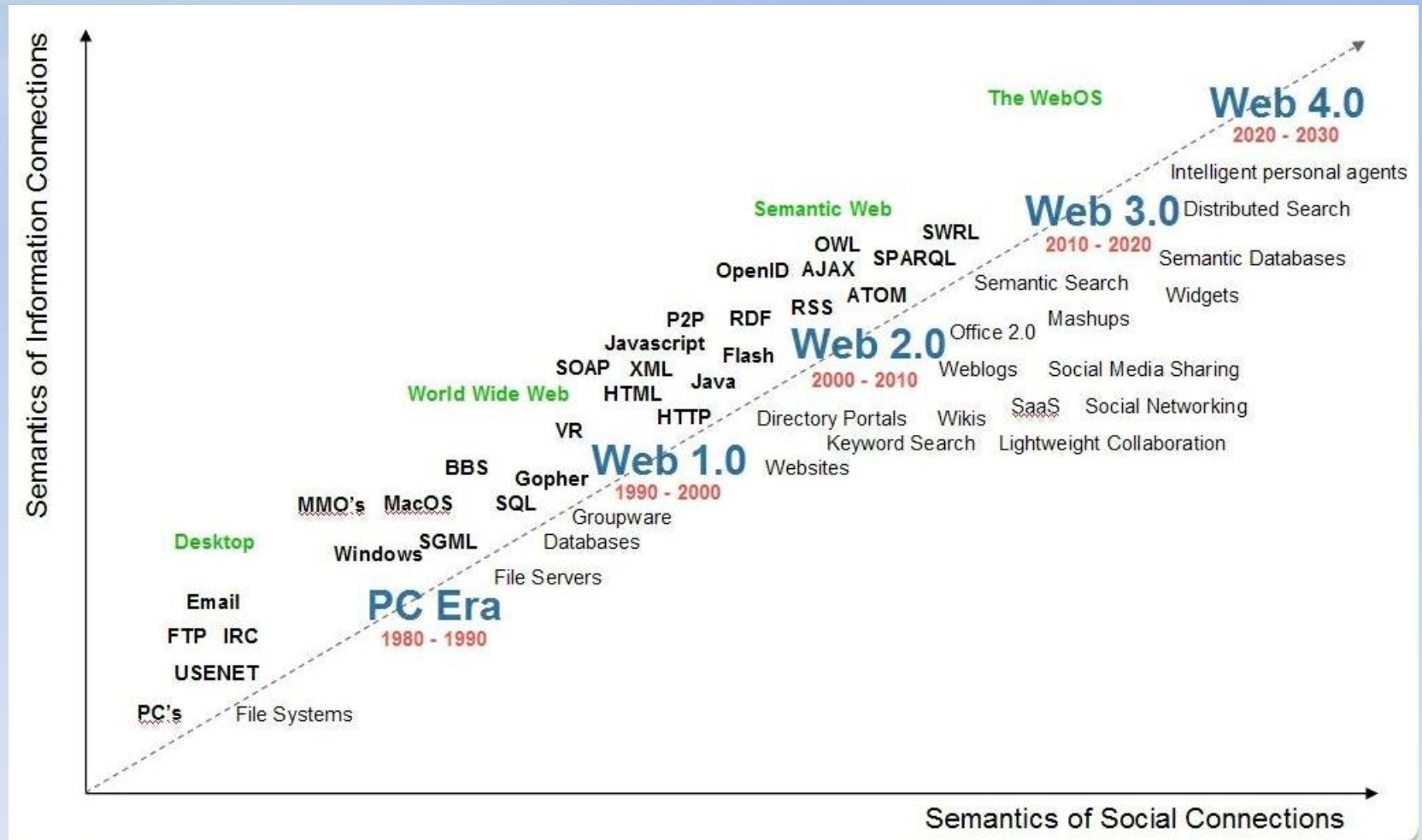
Source: Radar Networks & Nova Spivack, 2007

Summary

- It is not known exactly what already existing Web 2.0 mean, not to mention the upcoming(?) Web 3.0.
  - On-line applications,
  - Content sharing.
- With the many different Web 3.0 predictions, the most likely seems to be the collaboration of many different devices, the exchange of data between them and personalization of both the application and the content.
- Web 3.0 including extensive AI, the Internet as a great organized database, may not come true in the near future…