UNIVERSITEIT GENT

Creating Values With Websites

Handelswetenschappen

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History of websites

September 10, 1945

Computers were not considered as databases, but machines to calculate. (E.g Counting the people who live in a country, calculate the weather)

Vanevar Bush (American) → dreamt of a device where information could be stored and retrieved in an easy way. "The Memex", the device for:

1) Information
2) Association
3) Retrieval

He didn't conceive the idea of connected computers, but one big device with a lot of information that you could buy.

Early 60's

Paul Duran:

The defense department started the packet switching

Packet switching: Small data to get to other departments

The technology of internet was created

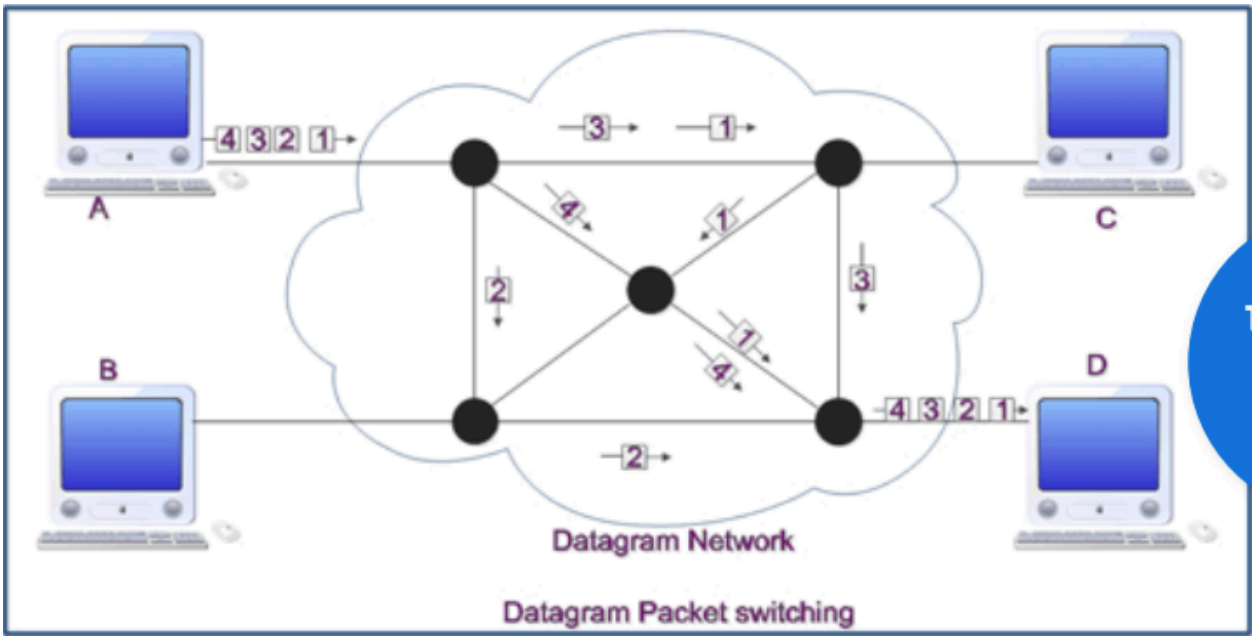
Why? The cold war

The Soviets came up with satellite (Sputnik) and the Americans had a problem. Because in a war, the first thing you have to destroy are the communication centers. The Americans only had a single line from the east to the west.

DARPA (Defense Advanced Resource Project Agency)

Multiple points in between (routers) any two points in a network.

In a simple network with 4 computers . Computer A sends a packet to the router → the router has 3 choices to go. He chooses the other router which would bring the packet the fastest (the shortest lines or if another router doesn't have a lot of packets). Now we have a system to have multiple ways to go from A to D. If one is destroyed, the system knows that the message is not arrived and sends it through another way.



Datagram Packet switching

→ THIS IS HOW THE INTERNET WORKS

→ But it was only a concept

September, 1969

First time Duran's idea really worked

Birth of Arpanet (first name for internet)

First connection between UCLA (university) and IMP (Inter Message Processor).

Computers were used by big corporations and big governments

August, 1981

First PC: (IBM 5150)

IBM (International Business Machines) ($1500 dollars, now $4000)

March, 1989

Tim Berners Lee:

Created the first browser (very important).

→ Internet is not an application like email or surfing on the web. Internet is an infrastructure.

He truly invented all the important technologies to enable the world wide web + created the name. He wasn't a ITC researcher, he worked at CERN. (Conseil Européen pour la Reserche Nucléaire).

He wanted a system for pages with hyperlinks to find everything more easily.

It was created on a NeXt-system → Other company of Steve Jobs.

Other inventions:

1) **HTML** (hypertext mark-up language)
2) **URL/URI**(Uniform resource locator/indicator) → The thing that gives you the location of a resource and the structure is uniform (it has to be written in the right way)
3) **HTTP**(hypertext transfer protocol) → protocol is a set of conditions on how computers should talk with each other. Why? To create software that will work on every computer. If the rules are fixed, then it doesn't matter what browser you use, they all follow the same http rules.

Since then the internet stayed the same → some differences

1) There were not enough IP addresses left. They had to change them from a 32-bit to a 64-bit. A lot of change, they didn't expect such great success of the pages.
2) The browser still works with HTML but it has changed a little bit.

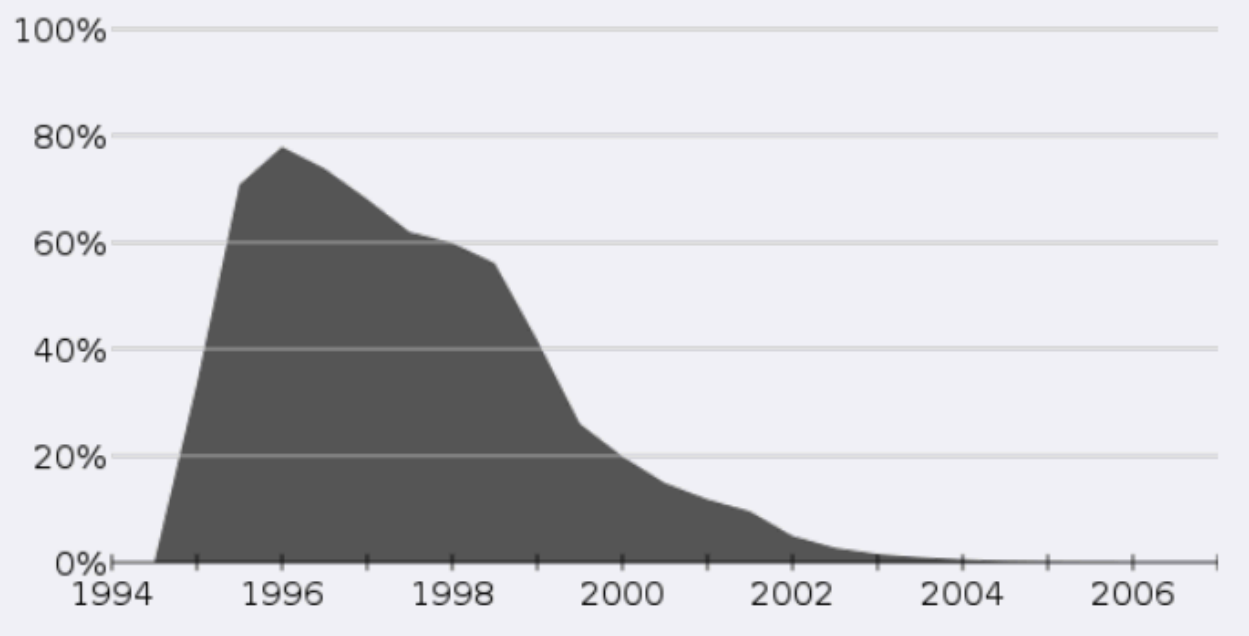
October 1994

Marc Andreesen

First good browser, invented by Netscape

It was called Netscape Navigator → precursor of IE, Safari, Chrome …

In the mid 1990's the market share of the browser was huge (80% by the internet users). They lost it when Internet Explorer was invented. IBM approached Bill Gates for DOS (Disc Operating System), it exploded. The DOS was simpler than the others and they started to use this software on all the IBM computers. Other computer rivals also had to take this DOS to compete with IBM, so almost everybody had DOS. Microsoft owned the operating systems and they gave you a browser (IE was directly installed on your computer) so people didn't download Netscape and they lost their market share very fast.



1994

AMAZON

Jeff Bezos created Amazon. Started with books, now everything. Now worth $427 billion.

Amazon was created then. First called “Cadabra”. Misunderstanding with Cadabra and it sounded as cadaver so they changed their name.

Side information: In 1994 internet providers were establihed (Belgium → Telenet, Belgacom(Proximus)).

Since 1998

GOOGLE

Larry Page and *Sergei Brin*

You need something that knows of everything on the web to find a website?

They created an algorithm to do web crawling → scoring of pages. And also knowing how important they are (the more hyperlinks to your page, the higher you will feature and the more hyperlinks you have on an important page you will also get ranked higher).

They are a search engine, actually more advertising incomes. They sell advertisements, people who pay for their banners on companies and higher ranks on their search engines.

Ads are about data, the more data the better they can target you.

Main Goal →Getting as much data as they can.

Alphabet (Google is a division of Alphabet) the mother company.

2001

WORD PRESS

Mike Little and *Matt Mullenweg*

CMS (Content Management Systems) → Word Press is the most used, about 60% of the pages

It's easy but it's not really for advanced stuff.

Most used 3: Word Press, Joomla and Drupal (invented by a UGent student)

→ A lot happened but not on a technology level

2002

LINKEDIN

Reid Hoffman

Focused on a professional network → growing slow but steady growth

Like FB for working people. → 2016 Bought by Microsoft for $26,2 billion

2004

FACEBOOK

Eduardo Savarin and *Marc Zuckerberg*

First Harvard only → it started with a social platform and now many more

→ Has WhatsApp and Instagram

2005

GOOGLE ANALYTICS

Google bought the company “Urchin”.

Free and good → Google needs data so they give analytics data so they get more data.

- 2 important terms in analytics

  1) Segmentation: You try to make groups of types of people. If you segment your product on age, you can know how old your purchasers are.

  2) Goals: You have a lot of data, but you don’t want all of them. You can set a goal that only notifies on the things you want to know.

- API: Application Programming Interface

→ How to connect to pieces of software fluently with eachother

An API for software to put data into Google Analytics

Or

An API to put things of Google Analytics on your software (not everyone wants to get on your page)

2006

TWITTER

Jock Dorsey

He left Twitter and came back.

Trump’s value on twitter is 1/5th of its total value

INSTAGRAM

10 million users in one year, 700 million users now.

Facebook bought it at $1 billion.

You have to know the large information of the data on the slides. (no numbers of the graphs)

- Big difference of young people and older all around the world
- 57% purchased something online in the last year
- 2007 it was still pretty low (purchase online) now its really booming
  And etcetera, study the graphs on online purchasing by yourself.

What creates value in the digital world? DATA DATA DATA

The web technology landscape languages

HTML/CSS/JAVASCRIPT

HTML: Hypertext Mark-Up Language (exam)

- Elements: (where there is a tag in the beginning and it ends when the tag closes)
- Attributes: (hyperlink → <a> anchor) The internal style sheet says it is blue + underlined
- Structure – head vs body
  - Head: title, link
- Body
  - Block-level elements (By default, they are represented below each other → paragraph)
    - Div (division → to create a part of a page)
    - Nav (for the navigation of your page)
    - Article (news article)
    - Sidebar
  - Inline elements (by default, they are represented inline with the text → <a> element)

CSS: Cascade Style Sheets

Cascade → There are a few levels in CSS.

1. **INTERNAL STYLE SHEETS:** All browsers have their internal style sheet (the style sheet will say that there has to be margin) so it would look the same on different browsers.
2. **EXTERNAL STYLE SHEETS:** The browser looks if the CSS has a personal/external style sheet than it will take this. If it doesn't have an external style sheet, it will fall back to internal style sheet
3. **PAGE INTERNAL STYLE SHEETS:** Higher level than the External style sheet
4. **INLYING STYLE SHEETS:** Highest level.

The only one you work with is EXTERNAL STYLE SHEETS, the other two are bad website-coding. If you want to change the website, you don't need to change everything in the higher sheets level.

There are a lot of platforms to go on a site, you have mobile, tablet, desktops. You will need three different codes: an app for mobile, a site for cell phones.

Responsive platforms → platforms that are mobile-, tablet- and pc-friendly

→ Better: one code for all platforms → by media query in CSS. You can hide and enlarge things in your CSS for different platforms.

Bootstrap (the most important one) and Foundation fix this for you. Put a few words in HTML, and it's done.

It's very important to have content types if you want to make websites. If you choose books you have to have a content type, book and author.

Content Items → Entity references → text bars which are linked to another entity. So you have to change the data only once.

Views →

Blocks and regions →you have to create a template for your page → separate template for your home page and detail pages. On these pages you will have "blocks" in a region. A region is a predefined object put on your website (header, main content, footer) and then you can add blocks (a view, a menu) MK

Menus → From the beginning you will have 2 menus ("Main menu" and "User menu"→ we're not using this in this course)

Image styles → to change images (like image crop or scale, grey-scale)

CSS Compilers (Less, and Sass) → You want a variable to give a color a name. You don't want to put the hex code every time. But the programs wouldn't know what you mean with i.e. IMDB red. The compiler takes your code and converts it with a hex color code. It's a faster way to work with CSS. You can also mix colors to create another color.

You can also use Mixins, you can take parts of CSS and put it in a simpler way. Paragraph: red could be changed to paragraph.

CSS can't nest. To make styling easier you can nest. You don't need to put Header every time.

```
#header {
  color: black;
}
#header .navigation {
  font-size: 12px;
}
#header .logo {
  width: 300px;
}
```

```
#header {
  color: black;
  .navigation {
    font-size: 12px;
  }
  .logo {
    width: 300px;
  }
}
```

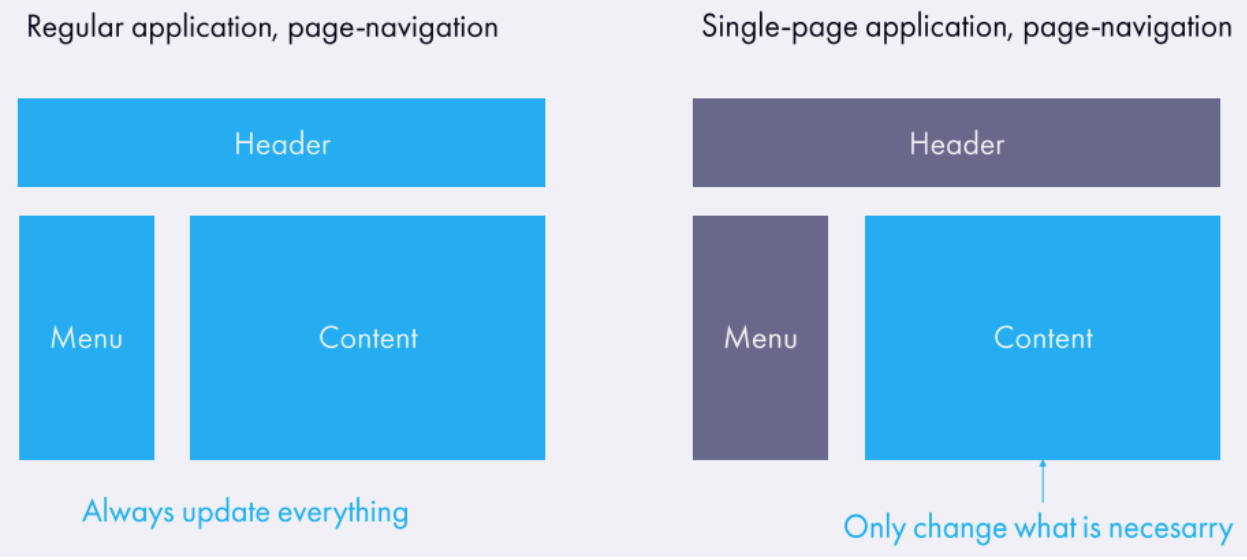
COMPLETE JAVASCRIPT FRAMEWORKS

*Angular: By Google → SPA (Single page application

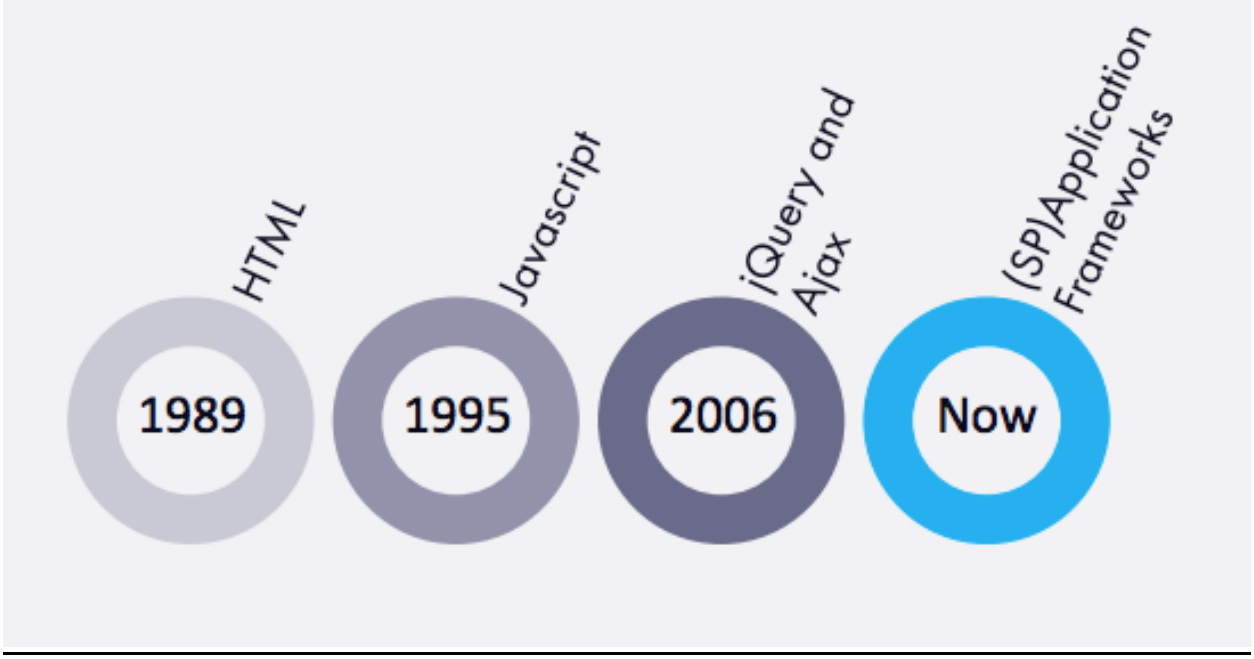
React: By Facebook

*JS frameworks as Angular make it very easy to make web applications such as G-mail for instance.

AngularJS is an open-source web application framework, maintained by Google and community, that assists with creating single-page applications, one-page web applications that only require HTML, CSS, and JavaScript on the client side. Its goal is to augment web applications with model–view–controller (MVC*) capability, in an effort to make both development and testing easier.



Regular application reloads the whole page again (HTML has to be resent to the servers) and the SPA only changes the raw data.



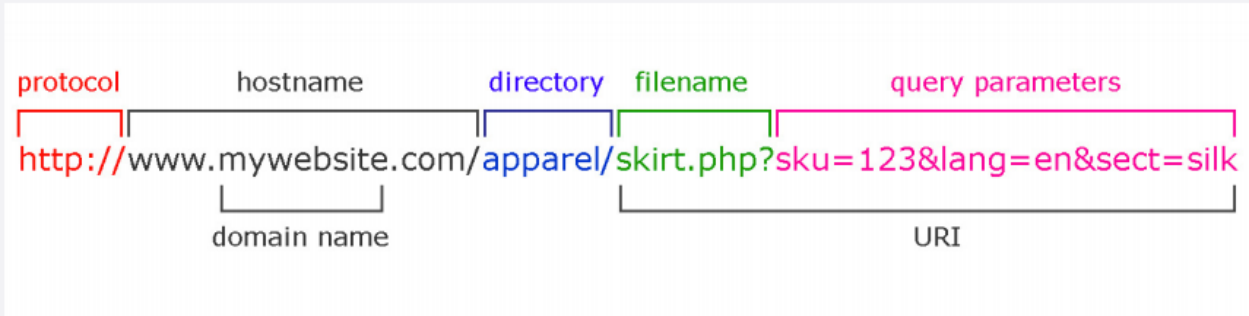
SERVER SIDE FRAMEWORKS

Microsoft NET*:* The most important one → C#

Java: Created by Sun Microsystems and is now owned by Oracle

PHP: (Hypertext Preprocessor) → often used for CMS

URL



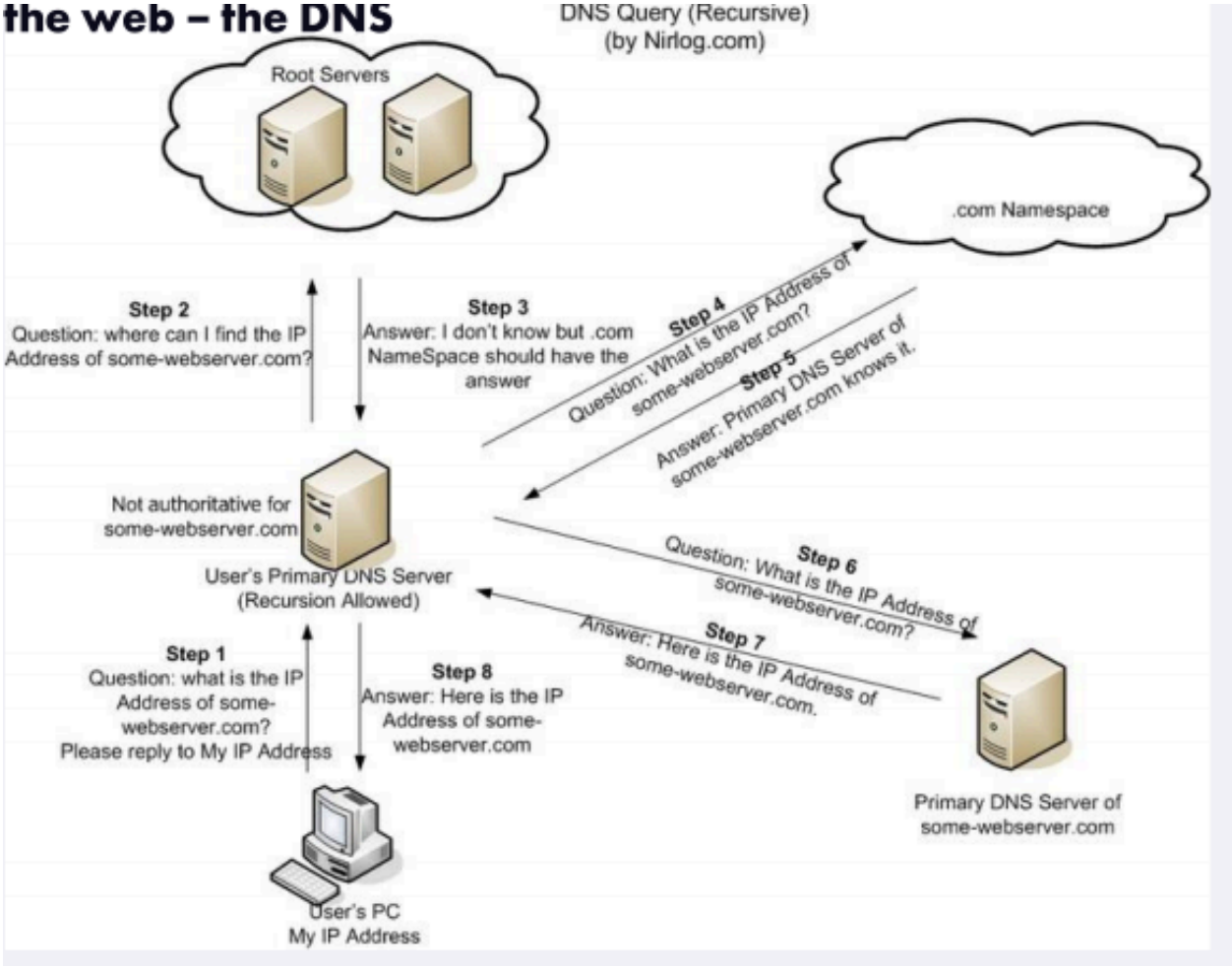
.com: TLD (Top Level Domain)

Directory + Filename + Quere Parameters = Question details you ask from the host

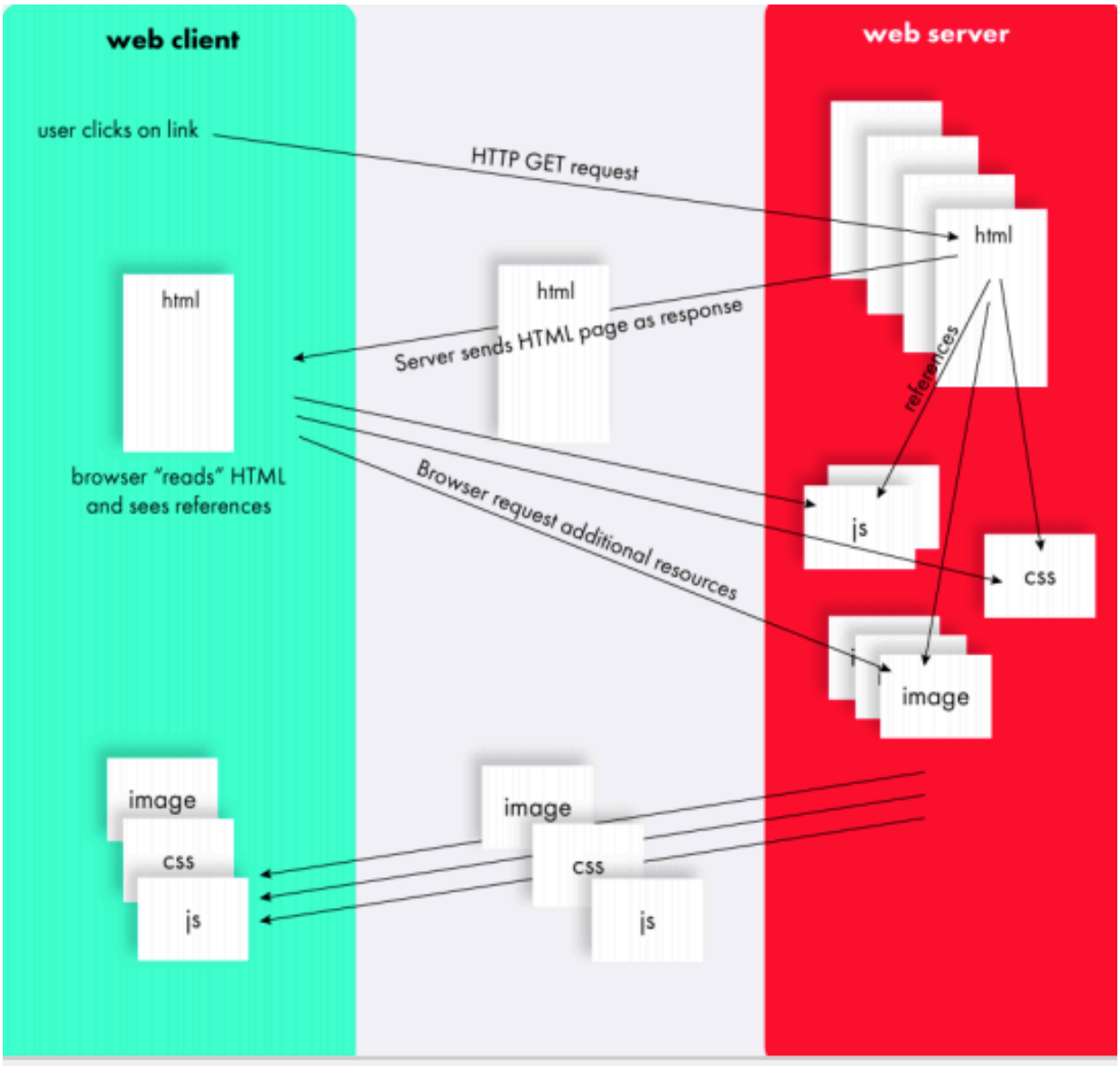
DNS

DNS (Domain Name Server)

The computer translates the IP-address (IP = Inter Protocol) and the domain name with the Domain Name Server

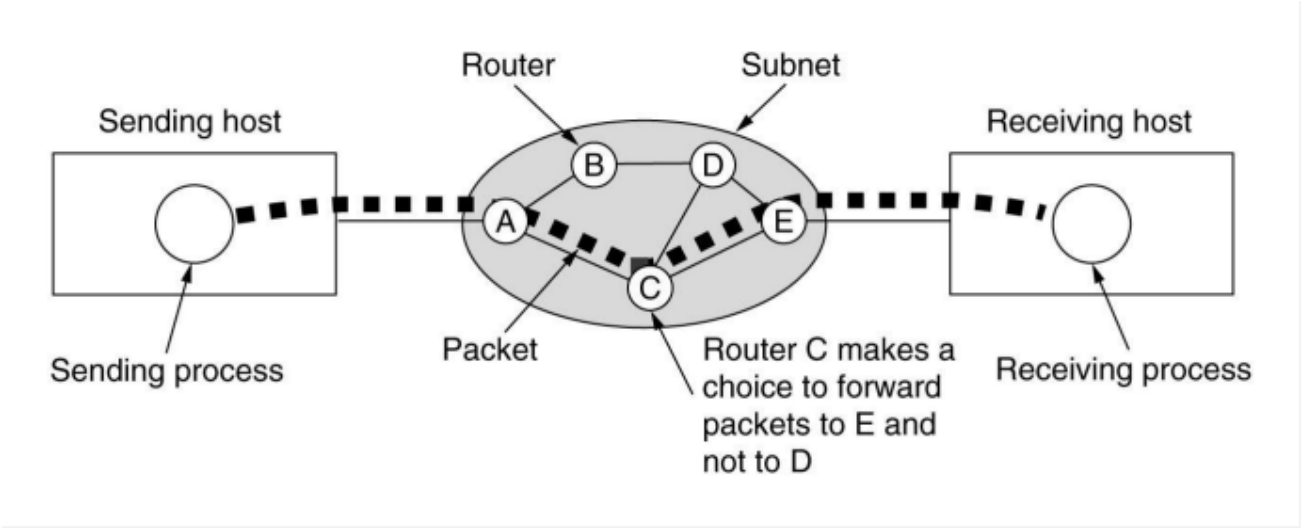


THE COMMUNICATION MODEL



PACKET SWITCHING

Created by Paul Duran



WEB SERVERS

1) Microsoft IIS
2) Apache

IIS (=Internet Information Services)

CLOUD SERVERS

Refer to serving computer operating through the internet. Example: Electricity, you could buy your own generator and make your own electricity (we bought a computer and we're making as example your own website), but you have a contract with an electricity provider and it's fixed. It's often wiser to rent the capacity. You don't want your own server, you just want the website.

THREE TYPES

On premises(=property): When you buy your own machine and maintain it, everything.

1. Infrastructure as A Server (IAAS): You rent the infrastructure, you just rent the hardware. It gives you full access to the hardware. Instead of buying the expensive server or hardware for a specific moment and don't use it anymore. You are renting computer capacity.

2. Platform as a Service(PAAS): You get the machine but the data and application are maintained by yourself (Drupal).

3. Software as a Service (SAAS): Gmail, everything is made for you. You can just use it.

Most known: 1) Microsoft Azure, 2) IBM cloud, 3) Google Cloud platform and 4) Amazon web service (very large of Amazon's business is selling cloud platforms)

MAIL SERVERS

Microsoft exchange is the most important one

SEARCH SERVERS

One big search server Lucene → Elasticsearch and Solr used Lucene and made it more friendly.

Caching server

- Clear cache: If you open a website, it's a slow thing to do for a server to find all the data. Drupal example, it has to look for the movies, the actors and look it all up in the database. The cache is a storage place on your server and it will look up the data from the previous event and it will open that for you. That's why you have to erase it when you update something

Middleware servers

IFTTT (If This Then That): app that says, if this happens then that will happen. Suppose you have a CRM system and you want to change something. Either you do the integration yourself or you use a middleware server. You send the event to the IFTTT so you don't have to change the connections between the CRM system and the website. It will make a direct link

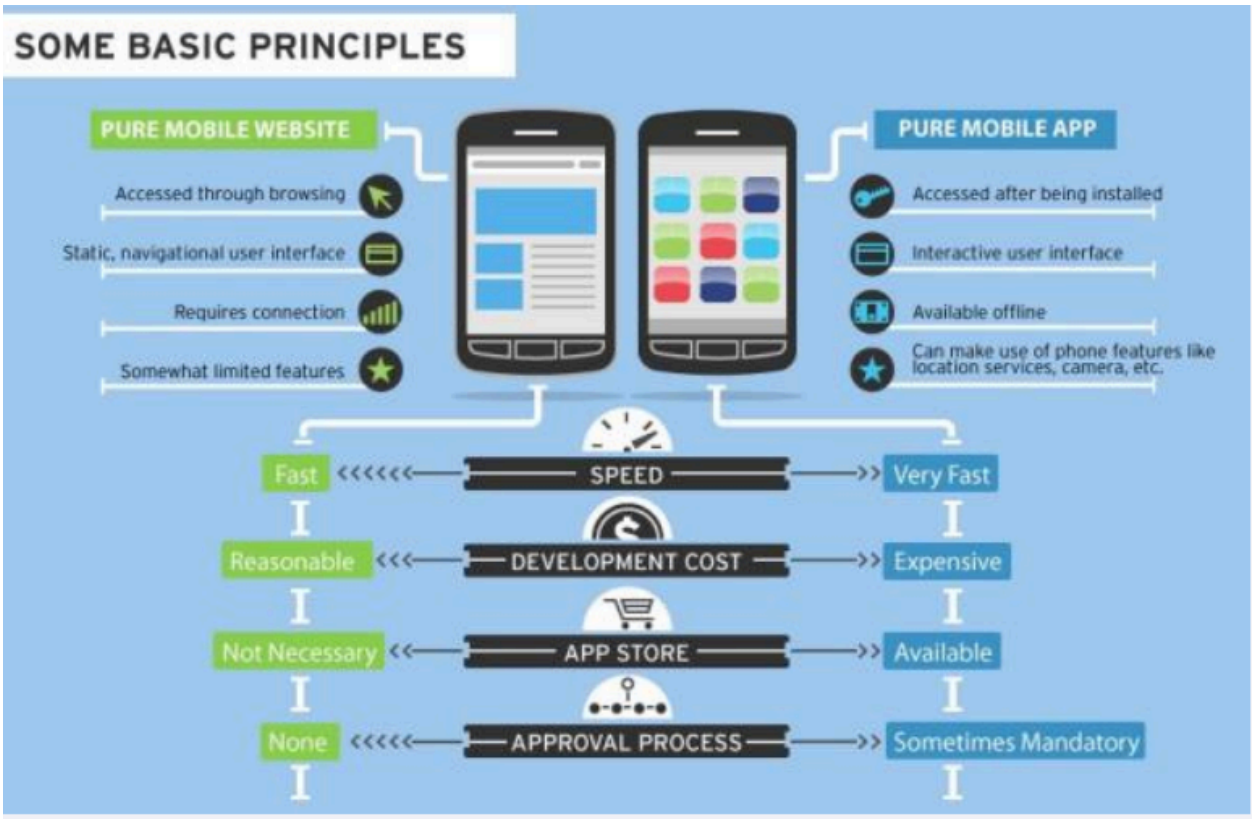
Database servers

With Drupal your data will be saved on My SQL

The traditional database servers, these are from the 70's and they are the most used. But now there are different database servers for more precise work.

Mobile web vs app

For the web you only need a browser to get to all websites, for apps you have to use different apps for every different occasion. But 90% of mobile use is on apps.



Development process

First faze: Analysis

1. Business analysis: To figure out what the business objective
2. Function analysis: What function should this website have that the company needs and how should it look like

Second faze: Design

Or the architecture faze.

Third faze: Implementation

Making the app/website.

Fourth faze: Testing

Fifth: Production

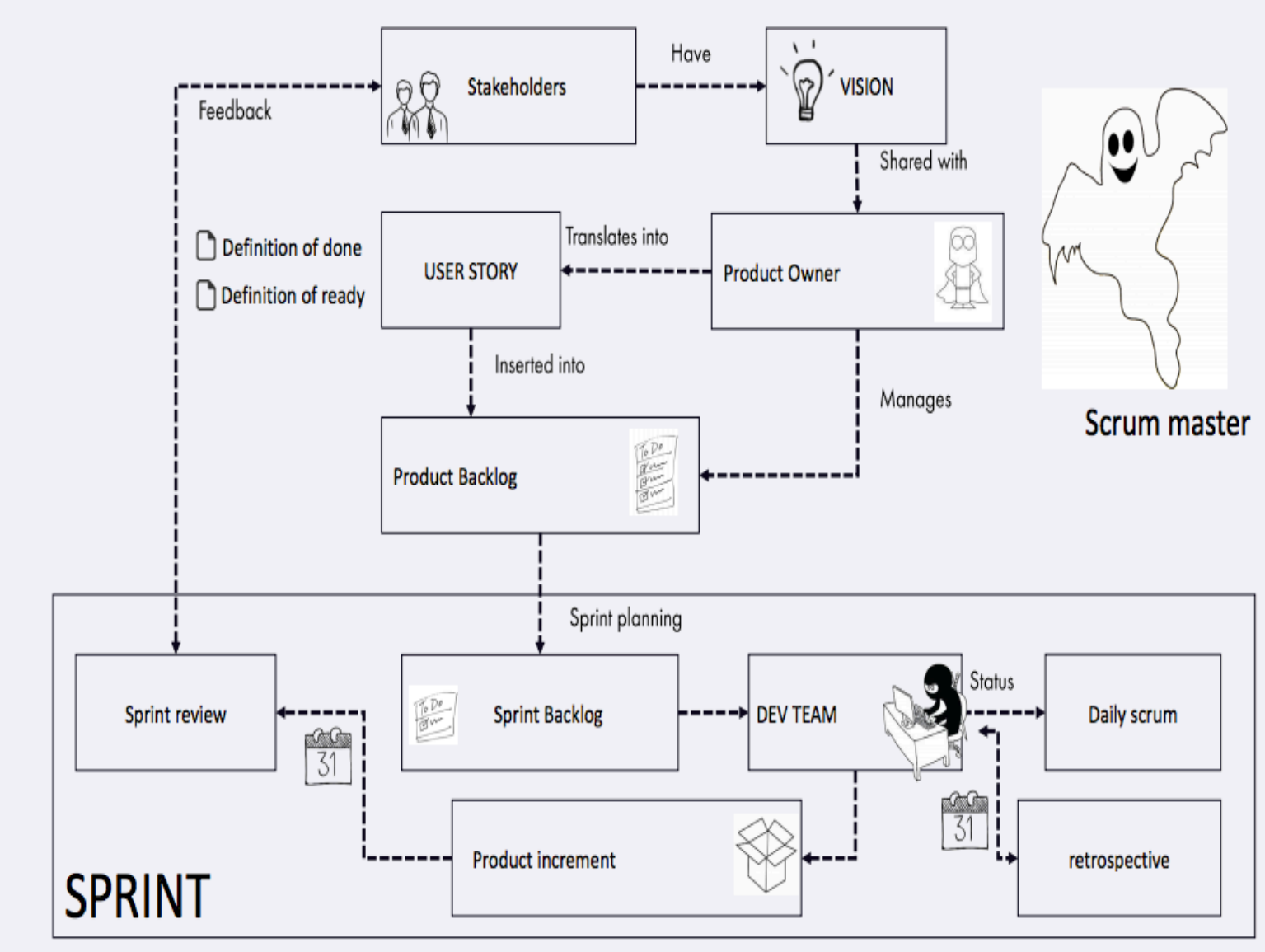
Bringing it out.

Sixth: Maintenance

To keep the app/website going.

Agile

Used for software development



https://www.youtube.com/watch?v=DscM_hE4fF8

Development language

LANGUAGES

GitHub pushes → online cloud based environment place to put your code that you developed. To make it easier in your code changes.

Javascript is the most used programming language and CSS is the third.

The job posting → Javascript and CSS are one of the most sought languages

TOOLS

Heavy weight

Slower and you need a better computer

- Microsoft Visual Code
- Cloud9 IDE(cloud based, it's a website → developing in your browser)
- Apple XCode (for apple)

The world is split in Microsoft and JavaScript and for JS the most used are

-Eclipse

-IntelliJ IDEA

Light weight

- Visual Studio Code

These programs are called: IDE → Integrated Development Environment

Debugging

Finding the mistakes for web-based stuff → Not only the visual but also the code.

→ Use Chrome!

→Chrome developer Tools on mac (Command + option+ I)

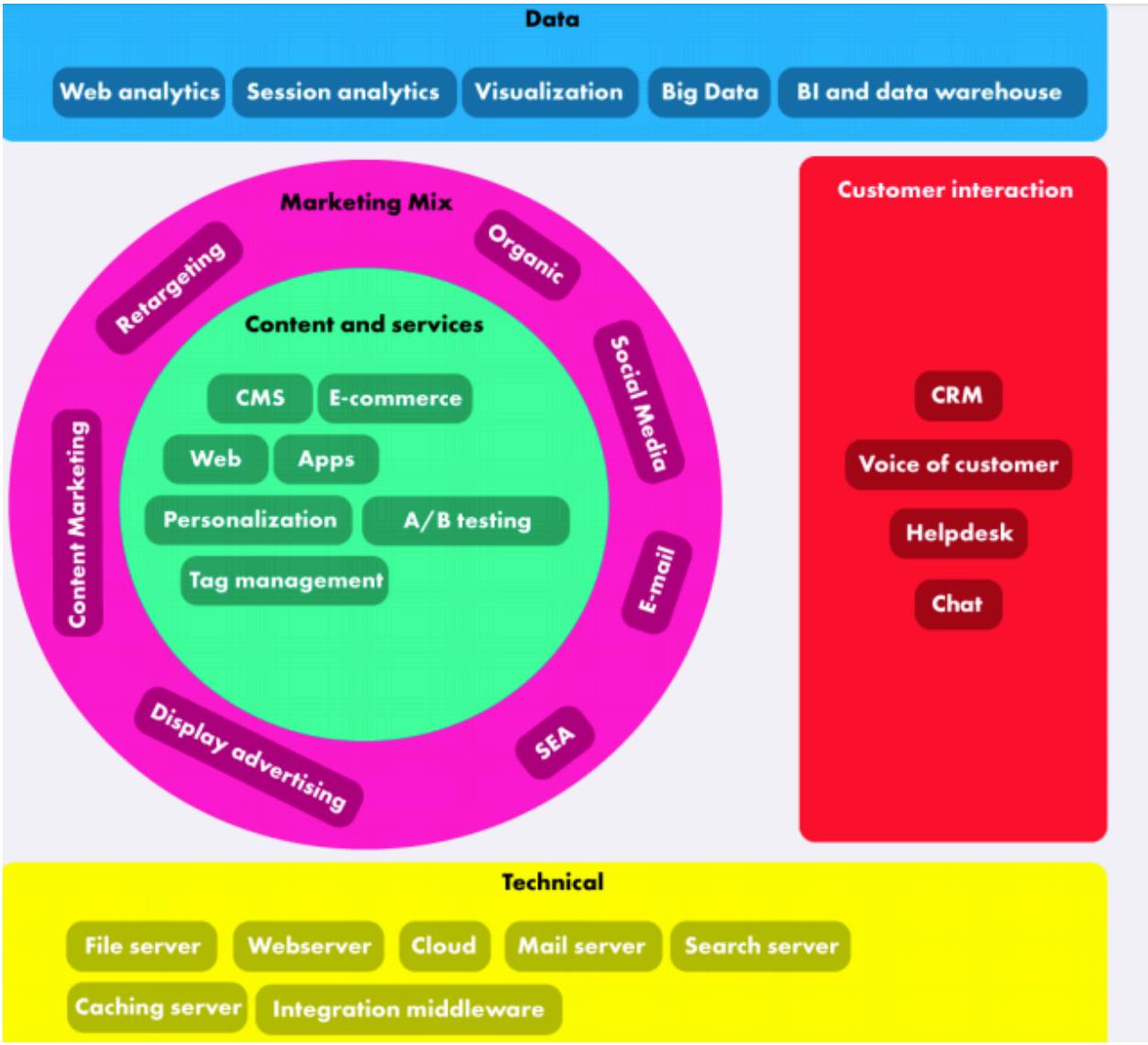
- Colorzilla → allows you to see the code of the color
- Wappalyzer → Gives you the various frameworks used on the page
- Fontface Ninja → It will tell you the exact font

The Marketing Stack

What?

The marketing stack is the set of technologies and channels used to engage with customers. It includes botch customer facing and back-end technologies and channels

OUR STACK



- Content and Service
- Marketing Mix → which channels are you using to get the Content and Service to your customers
- Customer Interaction → how to interact with the customers
- Data → capturing all the data in your channel to
- Technical → Technical necessities which are required to run all the rest

CONTENT AND SERVICES

CMS: (Drupal) Content Management System → Non-technical users can update the website with little or no input of ICT-staff.

E-Commerce: Various more specialized forms of CMS, such as e-commerce. Online store, shopping cart and a payment module

Web and Apps:

Web-based → accessible by a browser

Apps → not by a browser

Personalization: The best experience for a customer. Show different things to man/woman or children/seniors

A/B testing: (or multivariate testing) allows content managers to test various content values (changing title of an article). Instead of thinking you always have the best name for an article. System/tool that proves that people like a one title more than another. It sees that article B has a more attractive name than article A and will change the name.

Tag management: (web analytics) Every time the page loads it will send this knowledge to data analytics servers. Piece of code that does this is called "tag" (not like in HTML).

CMS

- WordPress
- Drupal
- Sitecore
- Sitefinity

} More business based

E-COMMERCE

- Most important one → Magento
- Shopify

PERSONALIZATION AND A/B

They mostly do both

- Optimizely and Barilliance

TAG MANAGEMENT

Google Tag Manager and Tealium

Content Marketing

Instead of shouting the message to the people and they maybe find it interesting → They really make interesting content and that's why people visit your website and not the good products (Nike tells random stories, nothing to do with shoes) (Pull/Inbound Marketing) instead of pushing your website, people want to visit your website because it's nice.

Display advertising

Whenever you see an advertisement banner → this is called Display advertising

SEA: (Search Engine Advertising)

When an organization pays to gets to the top on a search engine.

E-mail marketing and automation

Using newsletters and other E-mails to get to your customers

Organic search: SEO → Search Engine Optimization

High up in the search result → The first real search result (not paying), if you use tricks to get high you can get punished by google. Best way to get high → other people have to find you interesting. Based on other links from other websites.

Social media:

Here's where the talking about your product happens these days.

Retargeting:

Shopping online, looking at some products but not buying it. The same products are showing later in a banner on a different website. Zalando shoes showing up on a news website.

Products for organic search:

Google, Bing, Baidu (number one in china → 1 of the most important ones)

Social media

Channels

Facebook, Linkedin, Instagram, Youtube, Twitter, Whatsapp, Snapchat, Twitter.

Social Media Management

Additional programs which monitor the programs to see the negative comments of your Social media.

- Hootsuite and Buffer

Example: "Every time somebody uses my company's name, I want to know it ". or "A message I want to send the people, 7h00 on Europe and 8h00 in the USA" these programs do this for you

E-Mail marketing

To use automatic mails

- MailChimp
- Campaign Monitor

Content Marketing

Special group → Content marketing is so big and these have all these in one program

- Hubspot (created the term inbound marketing)
- Marketo

Display advertising

To put advertisement on different website, you need one of these services

- Google Adwords
- AdRoll

They buy the property/space on website and let other websites rent to show their products on their web properties.

Customer interaction

CRM: Customer Relationship Management

Getting the information of customers.

Typical products:

- Sales force
- Microsoft Dynamics
- SugarCRM

Voice of Customer: (VoC)

Designed to capture the voice of the customer with respect to the organizations

- Survey Gizmo
- SurveyMonkey

Helpdesk

Interacting with people for help. FAQ, it can also be a VoC.

- Zendesk
- Freshdesk

Chat

That you can integrate in your website. You can live chat with the working people.

→ in Real life there are a lot of overlaps

Web analytics: To get the data what pages the people are clicking on. Which order, which are the most clicked on…

- Google analytics
- Kissmetrics

Session analytics: They can replay the use of someone visiting your website. You can get a very good idea which parts of the website are hard to reach.

- HotJar

Visualization: Data is just data. It becomes valuable once it is analyzed, aggregated and visualized.

Products used for non professional IT'rs

- QlikView
- Power BI (Microsoft)
- Tableau

Business Intelligence and the Data Warehouse:

See ppt.

- Sas
- Cognos

Big data: not a product, any data which is too big to handle with normal data analytics. You don't want to use Kissmetrics and Google Analytics. You'll have to use these:

- Elastic Search
- Solr
- Spark

Web server: it serves HTML and communicates over HTTP

- Microsoft IIS
- Apache HTTP

Mail server: when you don't want to use these above → you'll have to make your own

When your mail server is sending their mail to another mail server it will use SMTP (Simple Mail Transfer Protocol). When you send a mail you send it to your server which it sends tot the other mail server through SMTP.

When your mail server is sending

POP3 (Post Office protocol)

IMAP (Internet mail access protocol)

- Exchange (Microsoft)

Cloud:

IAAS: offers hardware and OS

PAAS: offers hardware, OS and important server software

SAAS: actual end-user software (Gmail, on-line crm) only make an account

- Microsoft Azure
- Amazon Web Services

File server*:* Software that can be used to send files over a network connection

- FileZilla

Search server: Software for offering **FAST** search.

- Elastic search
- Solr

The same as big data.

Caching server: Software that specializes in improving speed of website by "caching" or "keeping ready" data between actual web/file/mail server and the client (e.g. browser). If the website didn't change, caching servers use the last changed website so it doesn't have to look in the database for the website and make it faster.

- Redis

Integration middleware:

You can define rules in this middleware, if this happens send a mail to the responsible person. Rules that happen when such an event happens.

- IFTTT
- Zapier

Database server: Software that provides data service through DBMS (Database Management Systems).

- Microsoft SQL Server (paying but very powerful)
- My SQL (free)

+ know "exampleWebsiteEnglish" on Minerva.