

## TRENDS FOR MODERN WEB-DEVELOPMENT

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Rapid development of web technologies entails the emergence of new trends in the area of web development.

Chatbot technologies (computer programs based on artificial intelligence) are becoming increasingly popular. Chatbots are classified according to their learnability as non-trainable or scripted, and trainable based on machine learning. According to the implementation platform chatbots are divided into messengers, websites online consultants, mobile applications, management systems and search engines. According to functionality, there are consultant bots, bots for data collection, service bots. Websites online consultant bots of particular interest are in fact question-answering (QA) systems.

The structure of the QA system contains several modules, among which the classifier of questions responsible for determining the type of question and, accordingly, the expected answer should be distinguished. Classifier uses information retrieval algorithms for selecting parts or the text potentially containing an answer. The filtering module highlights phrases that are similar to the expected answer. Another module for answers segregation finds the correct answer among selected phrases.

The work of the QA system is based on intelligent text analytics (ITA - text mining) — a branch of artificial intelligence having the categorization of texts and information retrieval as its key tasks. Categorization of documents, i.e. their assignment to one or several groups (classes, clusters) occurs both with the participation of a person, and without him/her. In case of documents classification, the ITA system must classify the texts into predefined classes, i.e. carry out a supervised learning. The user must independently define a set of classes and samples of documents (texts) that belong to these classes.

Documents clustering in its turn does not assume human participation. In this case, the ITA system must determine the set of clusters where the texts can be distributed. In machine learning terms, such task is called unsupervised learning.

Information retrieval task implies the identification of documents or texts that satisfy a certain query, and, in fact, is the task of

information retrieval in miniature, solved by information retrieval systems [1].

As for the technical implementation of chatbots, there are many bot frameworks, for example, Microsoft Bot Framework, api.ai, wit.ai, bottr.me and others allowing you to create a chatbot in a few days.

The Motion UI library is becoming more widespread, which allows you to instantly animate the website user interface (UI). The library contains files that allow you to create own animations, as well as files with pre-built effects. The library allows you to apply Motion transitions and animations to almost any element of the website. Library usage requires basic knowledge of CSS and JavaScript.

PWA — Progressive Web Apps are web applications combining the best features of websites and mobile applications. Similar to websites, Progressive Web Apps have a URL and load in any browser. They are also indexed by information retrieval systems. Thus, it is advisable to use search engine optimization tools to move them into the visibility zone. As for the similarity of PWAs with mobile applications, they are loaded in case of network connection loss, allow you to add shortcuts to smartphone home screens and send push notifications to users. Progressive web apps have borrowed core UI / UX trends from mobile apps, making their pages faster, more reliable and engaging.

Blockchain is a technology that based on a common database (Ledger) usage. Initially, the technology supported the digital currency Bitcoin, but now the blockchain allows you to solve many business problems. The essence of the technology lies in the fact that the database copies are spread across millions of computers, updated every ten minutes, and each subsequent transaction in the system is digitally signed by the hash sum of all previous transactions. All abovementioned makes such systems virtually unhackable. The blockchain implements the idea of full decentralization, all system participants have equal rights and can see each other's transactions. Web development applied to blockchain systems implements the client side of applications.

SSL (Secure Socket Layer) is a technology that allows to establish an encrypted connection between a browser and a web server. SSL protocol is activated after installing SSL certificate and encrypts personal information before transferring it to the website owner. Three keys are involved in the operation of an SSL certificate: public, private and session [2].

An SSL connection is established between the browser and the server every time a user visits the website. When you enter the website address in the browser it asks the server for a certificate for this website. The server sends not only information about the SSL certificate, but also the public key. After checking with the list of authorized certification authorities, the browser generates a session key, encrypts it with a public key, and sends it to the server. The server decrypts the received message and saves the session key. Then a secure connection is established using the HTTPS protocol.

Accelerated Mobile Pages (AMP) is a technology created by Google in 2015 that allows you to quickly load web pages at low network speeds. Using AMP allows you to reduce the page load time on mobile devices and significantly increase its position in search results, in Google in particular. Besides, for sake of technology popularization Google gives preference to AMP pages and also raises them in the SERP (Search Engine Result Page). To implement AMP on website pages, you need to convert HTML to AMP HTML (a simplified version of HTML) that recognizes AMP commands. Next, you add JavaScript, which allows you to load external assets, and run the AMP CDN, which provides next-generation caching for instant file delivery.

The presented trends do not exhaust all the news in web development. So, virtual (VR) and augmented reality (AR) technologies are gaining popularity; more and more tools are used to track user behavior on the website, like Google Analytics; new versions of development languages and popular CMS appear.

1. Christoffer D. Manning, Prabhakar Raghavan, Hinrich Schutze. Introduction to information retrieval.- Cambridge University Press, 2009.- 581p.

2. Как работает SSL-сертификат. URL: <https://ssl.com.ua/info/how-ssl-works/#> / (дата обращения: 12.10.2020).