Artificial Intelligence for Web Development

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Abstract

In this era of technology, one of the most trending and well-known technology is Artificial Intelligence. Top tech industries like Amazon, Google, Microsoft and Apple, and small scale businesses have been acquiring this technology quickly. Also, today having a website or Web App is mandatory for all the businesses in the market to provide fluency and easy accessibility. Due to this, Web Development is also growing at an unpredictable rate. Everyone wants secure and scalable Web Apps or websites. And the desire of users for enhanced experience along with the customized content is ever-growing. The user is searching for smart feature-packed Web Applications with highly personalized UX. So here come the questions that, can we relate this two highly growing and must needed technology? If yes, then how AI will affect Web Development? Or how AI will contribute to Web Development? To answer this question, I have tried to cover all aspects like introductions to AI and Web Development, in what way AI features can be used while building a website or web apps, and how they contribute to each other; with some detailed analysis that includes what the positive and negative impacts of AI in Web Development are. Also, I will be answering the question about what is the future of AI in Web Development.

Keywords: - *Artificial Intelligence (AI), Web Development, Machine Learning (ML), Deep Learning, Web Applications (Web Apps), Web Sites*

INTRODUCTION

Our world is changing faster in many ways; one of the things which will have a significant impact on our future is undoubtedly the Artificial Intelligence (AI). AI is a hot topic with many practical applications such as self-driving vehicles, voice-assisted control, automated traders, customer service Chatbot, E-commerce, predictive analysis and many more. AI techniques have shown excellent results when a substantial amount of data is available or human-like interaction and decision-making are needed.

One domain in which we have to deal with massive data and need the human-like interaction is Web Apps or Web Sites, and in general, we can say Web Development because we know that in this day and age, we will need a scalable and secure way to interact with people, and as fast as

possible. Over recent years, there has been some improvement in web development, for example, semantic webs, chatbots, predictive analysis, and customer interaction. However, the use of AI in Web development is still in its infancy. Thus, why not take advantage of such powerful technology to improve Web Development.

UNDERSTANDING THE TERMS

Artificial Intelligence

Artificial intelligence, sometimes called machine intelligence, is intelligence demonstrated by machines, unlike the natural intelligence displayed by humans and animals. In simple words, Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. Artificial intelligence (AI) uses computer science programming to imitate human thought and action by analyzing data and surroundings, solving or anticipating problems and learning or self-teaching to adapt to various tasks, which can be helpful to do projects like a self-driving cars, Chatbots and voice searching etc. That is why AI is growing at a rapid rate. But the question is, how AI works? Well, AI works by combining large amounts of data with fast, iterative processing and intelligent algorithms, allowing the software to learn automatically from patterns or features in the data. AI is a broad field of study that includes many theories, methods and technologies, and the following major subfields: Machine learning, Deep Learning etc. Machine learning (ML) is commonly used alongside AI, but they are not the same. We can say Machine learning is a part of Artificial Intelligence. And while talking about artificial intelligence in web development, we can consider any of the subfields of Artificial intelligence

because we can use any of them with different usage in web development. For more understanding, please refer to the image shown below.
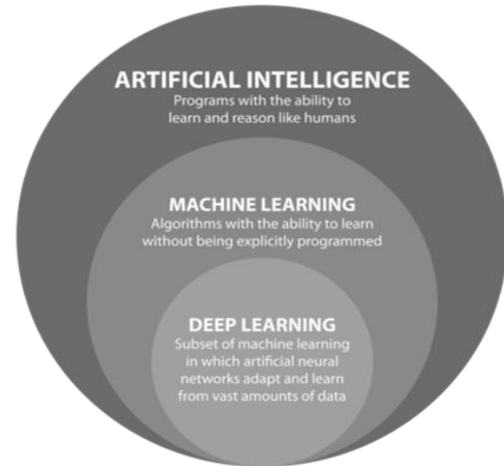

Fig. 1 - Artificial Intelligence and its subparts

Web Development

Web development is the work involved in developing a Web site for the internet or an intranet. Web development can range from developing a simple single static page of plain text to complex Web-based Internet applications, electronic businesses, and social network services. We can use web apps and websites to gather information or get any services provided by a specific company or group. Like every other technology, Web Development also has a broad category that includes specialization like Frontend Development, Backend Development, and Full Stack Development. Coming to the use of Web Development, nowadays, it's used for commercial purposes or to show some statistical data and serves more broadly for communication and social networking and data generation. All this has led to the growth of web development at a rapid pace. Also, having websites or web apps is mandatory because it is the easiest and efficient way to interact with customers without doing much. Just

for the understanding purpose, please refer to the image shown below.

Fig. 2 Web Development

ARTIFICIAL INTELLIGENCE FOR WEB DEVELOPMENT

While talking about AI in Web Development, we can usually think of three questions: why implement AI in Web development? How is AI contributing to it? And what is the negative impact of AI on Web Development?

Why Use AI in Web Development

From experience and research, we can say that more and more users prefer to search for any product or information directly through websites or over the internet rather than going traditional ways. Large e-commerce firms are changing our attitude towards online shopping. Marketing and availability of data are increasing day by day over the internet. So to enhance the users' experience or gain the users' traffic in this competitive world, all the companies need to think creatively and adapt new technologies to make things much more manageable. That's why leading companies and small businesses try to include innovative technologies in their websites, such as chatbots, voice searches, and even some concepts of data mining, pattern recognition, etc. For more understanding of the powerful impact of AI on web development, we can consider the following point.

- An excellent alternative to conventional data mining

- Removes security threats
- The stock of Machine Learning APIs
- Speedup Product Discovery
- Produce customized content and information
- Understand Customer Behavior

So we can see that AI helps a lot in web development, and it also saves time and effort and provide more value over traditional ways.

How Is AI Contributing To The Web Development? (Pros)

To answer this question, we can think of many things by which AI contributes to Web Development. Some of them are listed below.

Web Designing Made Easy

We can use the features of AI to make designing easier in web development so we can save time in actual application construction. One of the best examples to explain this point is sketch2code, a Web App that can take any handwritten design on the blackboard or the paper and turn it into an HTML structure.
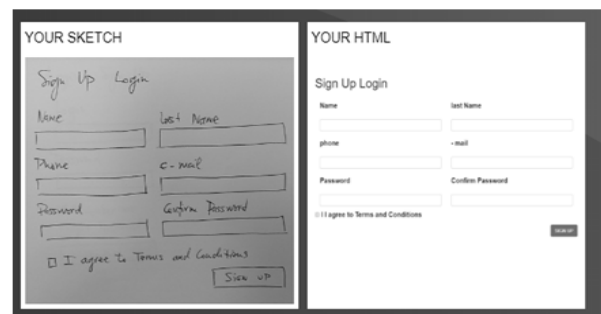

Fig. 3 Sketch2Code

By using this AI-powered Web App, you can see that this will reduce lots of effort to create a design, and we can start the development process early.

Coding Made Easy

AI is helping the developers to automate various tasks that would allow them to find the solution or

to make coding accessible for instance; Microsoft has introduced many AI-based features in its visual studio code editor. AI-assisted Intellisense is one of them which provides AI-based suggestion and full line completion. You can see the suggestion example in the image shown below.
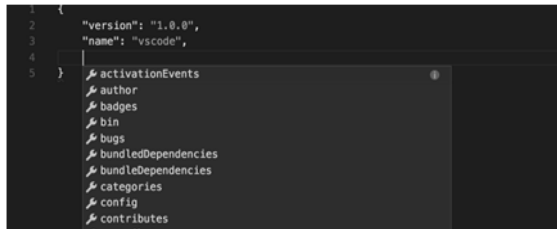

Fig. 4 VS code IntelliSense

Analyzing Customers Behavior

With the help of machine learning, the websites owners and store owners have the power to analyze the customers' behaviour. This is beneficial to the owners and customers because it will save users time and help owners gain traffic and more information about users and the behaviour of their site. Also, based on that, they can provide a customized user experience.

Fig. 5 Behavior Classification

Users Experience

With the help of AI, many websites added voice search and chatbots to their websites to enhanced user experience. Most importantly, AI-enabled websites can process information and data on any scale to serve end users according to their interests in the right way.
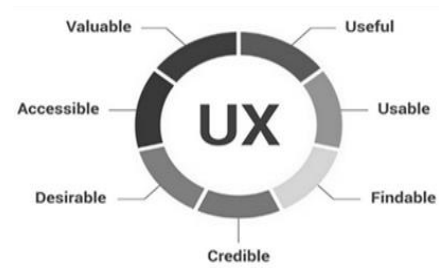

Fig. 6 factors that influence UX

Marketing

The owner must adopt AI for marketing analytics techniques to achieve a better result. It will be helpful to both the owners and customers as it will generate user traffic for the owner, and customers will be able to get suggestions quickly. One example is whenever we go to buy, we often see the line "if you like this, you might also like this", so that is content curation and recommendation. Also, writing SEO optimized headlines (clickbait) is an example of marketing with AI.

Testing and Quality Assurance

We all know that testing and quality assurance is of high value in any project. And AI can be helpful to such tasks, which will reduce stress and errors. This would not only improve performance and speed but would also contribute to maintaining data and meaningful inferences. Testing and quality assurance can be faster decision-making with AI, reuse test cases, maximum code coverage in limited time, error checking, etc.

Negative Impact of AI in Web (Cons)

Everything has its pros as well as cons. We have discussed the pros of AI, but it also has some negative impacts, which we have to consider before jumping into it.

Human Replacement

According to a study, by 2030, up to 90% of all jobs will be in danger of being replaced by smart machines. This may include web design, graphic

design, and mobile application design since AI has proven to be more efficient content formation to adapt to various devices. Yes, we do have a point that to build those machines or guide them, we will require manpower more or less, but it will affect such particular areas, and human replacement will happen in that.

Privacy Issue

Since artificial intelligence and machine learning can monitor consumer behaviours and online interactions, many consumers often feel uncomfortable. When combined with artificial intelligence, software such as analysis has unlimited potential to extract data and ideas from customers. Therefore, it could be scary for consumers because, according to surveys, 94% of them want to do business with a company with complete transparency. We know that maintaining data privacy is so hard even in these days of highly evolved technology; then, we can only imagine when AI will come to an actual picture.

Impersonal Interactions

In the digital age, many users still want personal responses; therefore, we are moving away from those much needed personal interactions by implementing artificial intelligence. Despite how well you have created your chatbots and automatic reactions, customers can still realize that it was sent by artificial intelligence.

THE FUTURE OF AI IN WEB DEVELOPMENT

Innovation is happening, and AI is the hottest piece of technology that contributes to the whole scenario. According to the Gartner Report that AI chat-bots will handle 85% of customer interaction. And it will help online businesses to save eight billion dollars worth of business by the year 2022.

This tells us that the future of AI is bright and shining.

According to a Statista report, the revenue generated from the AI software market worldwide is expected to reach $126 Billion in 2025.
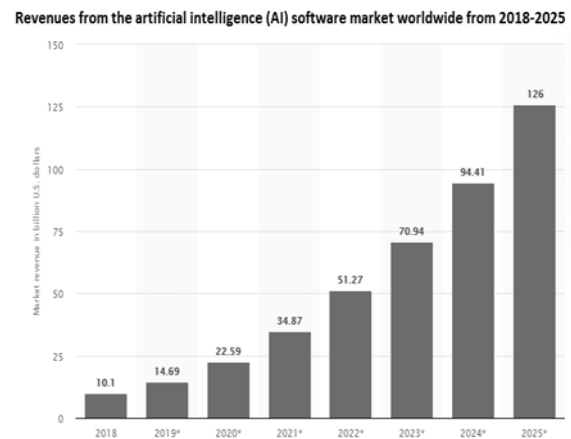

Revenues from the artificial intelligence (AI) software market worldwide from 2018-2025

Fig. 7 predicted AI revenue generation.

Although we can say that even the most powerful technology can't fully replace web development, Artificial Intelligence (AI) can undoubtedly empower them to excel in their professions by streamlining manual processes. AI-enabled Web Development and design tools can automate routine and lengthy procedures.

CONCLUSION

No doubt, AI is transforming the way present-day websites are being developed. That's why many software development companies use AI power to create smart Web Applications for increasing engagement, scalability, interaction, experience and overall feel of the website. For web developers to evolve, they need to embrace and accept the changes to move forward. AI is one essential part of this change and is one doorstep away from the future. Thus, it is safe to say that AI will make it big in web development services. And we all must learn to work and adapt to it. AI in Web Development, of course, has pros and cons, but

one thing we can conclude here is that AI cannot fully replace Web Developers. However, it doesn't change the fact that Web Developer must learn to interact with it.

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