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A Review on Artificial Intelligence in Software Industry

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ABSTRACT: Developments in AI technology was brought about by several factors. When human activity—academic, commercial, and social— began to happen in digital platforms, huge volumes of data resulted. To capitalize on these big data, industries responded with more powerful processors, bigger and more affordable storage, and smarter networks. Next, the artificial intelligence platform was built (or re-built) to improve the collection, processing, and analysis of data, so people can act upon data-driven information and insight. AI software is software that applies artificial intelligence to carry out specific tasks. Machine learning algorithms differentiate the software from other applications, enabling them to learn or improve their performance without having to be instructed step by step. The software uses its interface to recognize conversational language, speech, images, and other patterns. Applied across a wide area of systems, AI software can automate tedious repetitive tasks, predict regular actions, assist decision making by providing analytical proof, and recognize individual patterns to offer personalization..

KEYWORDS-AI impacts, Issues, Advantages, Disadvantages, Applications, software tools.

I. INTRODUCTION

AI in software:

AI software is software that applies artificial intelligence to carry out specific tasks. Machine learning algorithms differentiate the software from other applications, enabling them to learn or improve their performance without having to be instructed step by step. The software uses its interface to recognize conversational language, speech, images, and other patterns. Applied across a wide area of systems, AI software can automate tedious repetitive tasks, predict regular actions, assist decision making by providing analytical proof, and recognize individual patterns to offer personalization. It is known that the new technological revolution and the new industrial revolution are gaining momentum. We believe that the new era of 'Internet plus artificial intelligence (AI)', characterized by ubiquitous networks, shared services, cross-border integration, automatic intelligence, and mass innovation is coming. The rapid development and fusion of new AI technologies with Internet technologies, new-generation information technologies, new energy technologies, materials technology, and biotechnology is an essential part of this new era, which in turn will enable the game-changing transformation of models, means, and ecosystems in terms of their application to the national economy, well-being, and national security.

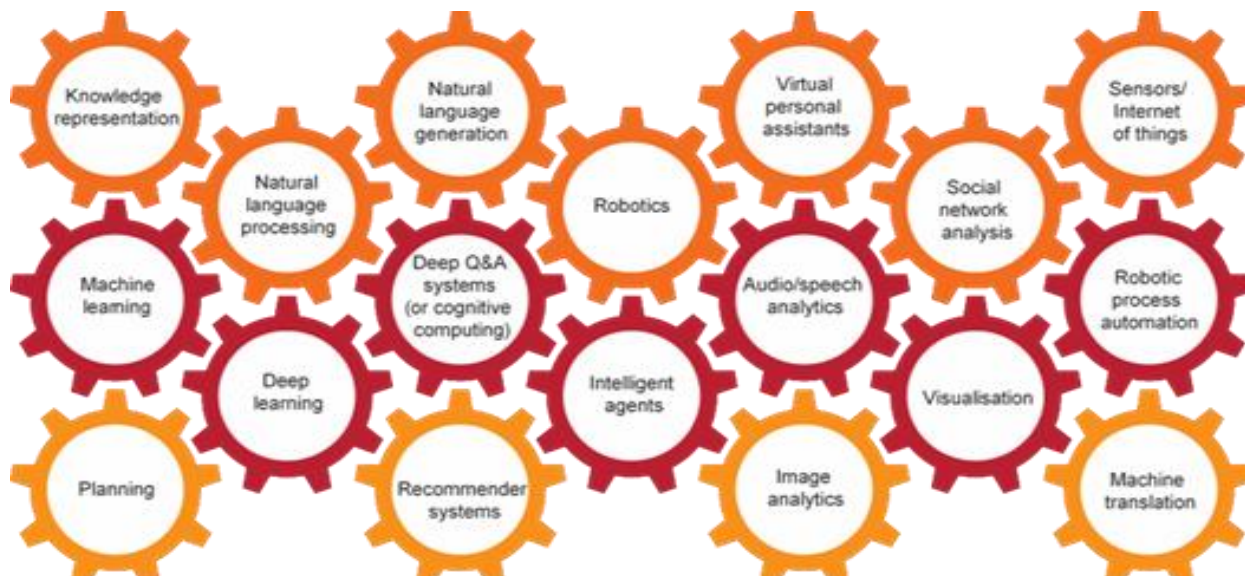


Figure 1:Topic Area of AI

II. ISSUES IN COMPANIES

1. Eliminate dull tasks

We all have days where we have to do busy work: dull, boring tasks that may be necessary but are neither important nor valuable. Fortunately, machine learning and AI are beginning to address some of this through human-computer interaction technologies. Virtual assistants like Siri, Cortana, and Google Assistant perform basic tasks, conversing with the user in natural language.

2. Focus diffuse problems

Data informs every level of a modern company's operation. Even small businesses have a lot of material to interpret, so a major enterprise consumes amounts of information at a scale equally awe-inspiring and terrifying. The expanse of available data has gone beyond what human beings are capable of synthesizing making it a perfect job for machine learning and AI. For example, Elucify helps sales teams automatically update their contacts.

3. Distribute data

Modern cyber security drives a need for comparing terabytes of inside data with a comparable amount of outside data. This has been a very difficult problem to solve, but machine learning and AI are perfect tools for the job.

4. Solve dynamic data

Every business book written in the past 50 years has sections devoted to developing efficiency; it is a prized workplace characteristic. A major stumbling block in that pursuit has always been addressing individual employee traits. Now, some forward-looking companies are adopting AI to solve the dynamic problems of human behavior.

5. Prevent dangerous issues

Cutting-edge industrial systems combine AI-powered robots, 3D printing, and human oversight. Not only can companies realize billions in savings with these systems, but they will also save lives.

Industrial automation leader Rethink Robotics builds interactive robot systems driven by AI. This process not only reduces cost and improves efficiency for the company, but creates much safer environments for the human workers.



III. AI IMPACTS IN SOFTWARE DEVELOPMENT

AI plays a key role in the design, code generation and testing of software. Let us discuss each area in detail:

Requirement Gathering

Being a conceptual phase of SDLC, the requirement gathering requires maximum human intervention. Artificial intelligence offers a broad range of techniques/tools like Google ML Kit, and Infosys Nia to automate certain processes to minimize human intervention to some extent. This phase includes plenty of emphasis on detecting loopholes early before moving to design. A technique of AI called Natural language processing will make machines understand the user's requirements in natural language and automatically derive high-level of software models. Of course, there are some issues with this approach including difficulties in balancing the developed systems. However, it remains as one of today's hot research topics.

Software Design

Planning projects and designing it needs specialized learning and experience to propose a definitive solution. Settling on a correct design for each stage is an error-prone task for designers. Retracts and forward investigating plan forces dynamic changes to the design until the client reaches the desired solution. Automating some complex procedures with AI tools can enable the most capable methods to design the projects. For example, using AIDA (Artificial Intelligence Design Assistant), designers can understand the needs as well as the desires of the client and use that knowledge to design the appropriate project. AIDA is a website building platform that examines various combinations of software design.

Automatic Code Generation

Taking a business idea and writing code for the huge project is still time-consuming and labor-intensive. To confront the time and money concerns, experts have approached a solution that writes code before starting development. However, the approach is not good with uncertainties like what target code aims at doing as collecting these details takes much time like writing code from scratch. An intelligence programming assistance with AI will reduce the load by a certain extent.

Imagine that if you explain the project idea in your natural language and your system would understand it and convert it into executable code. Though it seems like science fiction, software development artificial intelligence can flip the story! It will be possible through natural language processing and AI tools.

AI in Testing Services

Software testing is a crucial phase in software development, which ensures the quality of the product. If certain software testing is repeated whenever source code is changed and repeating the same tests can be time-consuming and costly. The capture here is AI in software testing comes to the rescue once again. There is a wide range of tools that employ AI for creating test cases and performs regression testing. These AI tools can automate the testing for you and further ensure error-free testing. Appvance, Functionize, and Testim.io are a few examples of AI and machine learning-based testing platform.

Deployment Control

Machine learning AI technologies also had some impacts on software deployment, like an increase in the efficiency of deployment control activities. In the software development paradigm, the deployment phase is the stage where developers often upgrade the programs or apps to newer versions. If developers fail to execute a process correctly during upgradation, there will be a high risk in executing the software. AI can prevent developers from such vulnerabilities during upgradation and reduce the risk of failure in deployment. Another impact of artificial intelligence is, it enables to analyze the deployment process with machine learning algorithms.

IV. ADVANTAGES AND DISADVANTAGES

Advantages:-

1) Reduction in Human Error

Example: In Weather Forecasting using AI they have reduced the majority of human error

2) Available 24x7

Example: Educational Institutes and Helpline centers are getting many queries and issues which can be handled



effectively using AI.

3) New Inventions

Example: Recently doctors can predict breast cancer in the woman at earlier stages using advanced AI-based technologies

4) Helping in Repetitive Jobs

Example: In banks, we often see much verification of documents to get a loan which is a repetitive task for the owner of the bank. Using AI Cognitive Automation the owner can speed up the process of verifying the documents by which both the customers and the owner will be benefited.

Disadvantages:-

1) High Costs of Creation

As AI is updating every day the hardware and software need to get updated with time to meet the latest requirements. Machines need repairing and maintenance which need plenty of costs. AI is making humans lazy with its applications automating the majority of the work. Humans tend to get addicted to these inventions which can cause a problem to the future generations.

2) Unemployment:

As AI is replacing the majority of the repetitive tasks and other works with robots, human interference is becoming less which will cause a major problem in the employment standards. Every organization is looking to replace the minimum qualified individuals with AI robots which can do similar work with more efficiency.

3) No Emotions

There is no doubt that machines are much better when it comes to working efficiently but they cannot replace the human connection that makes the team. Machines cannot develop a bond with humans which is an essential attribute when comes to Team Management.

4) Lacking Out of Box Thinking

Machines can perform only those tasks which they are designed or programmed to do, anything out of that they tend to crash or give irrelevant outputs which could be a major backdrop.

V. TOOLS USED IN SOFTWARE INDUSTRY

MATLAB

MATLAB from Math Works is a downloadable programming tool in a desktop environment. It allows you to create code, algorithms, and applications to run your data iteratively and automatically. Features include a Live Editor to create scripts in an executable notebook, tools to organize, clean, and analyze data sets, a drag-and-drop App Designer, a plot gallery to display graphs in many ways, and an API to use it with other programming languages such as Java and Python.

New Relic

New Relic One is a telemetry data platform for software engineers. It collects all types of operational data such as metrics, events, logs, and traces into a single place and allows software engineers to observe, analyze, and troubleshoot problems across their entire software stack. A built-in applied intelligence engine automatically detects, diagnoses, and resolves issues so you can respond to incidents before your customer does. The platform integrates with hundreds of tools and open standards to simplify monitoring of telemetry data.

Tensor Flow

Tensor Flow is a free open source software library to build machine learning (ML) models. It includes tools such as intuitive APIs to build and train ML models. You can deploy your ML- powered apps whether in the cloud, servers on-premise, browsers, and other devices. Some of the use cases of TensorFlow include training a neural network to identify specific anatomy during a brain MRI, how to rank Tweets in a timeline view, or to predict the dimension and weight of a shipment.

ArcGIS

Esri ArcGIS is a powerful mapping and analytics software. AI software and location-based analytics allows businesses



to gain insights with tools that visualize, analyze, and contextualize data. Users can collaborate and share information using maps, apps, dashboards, and reports. It has various use cases, such as for spatial analysis, field operations, mapping, 3D modeling, remote sensing, and data collection and management.

HOLMES

Wipro HOLMES is an artificial intelligence and automation platform for business and IT users. The software supports digital transformation of businesses with solutions that include natural language processing, algorithmic intelligence, self learning, and reasoning. These can be used together with current transaction systems. Users that can derive the most benefit are C-suite

VI. CONCLUSION

Thus, due to the various benefits of AI, its utilization is gradually increasing in the market worldwide. Most of the organizations are already implementing the AI technology, Software developers have to continuously adapt their competencies and qualifications to keep up with the dynamic and rapid development of AI tools in software engineering. They have to be open minded to apply these instruments in their daily work practice.

Software companies should encourage employees' engagement by providing leadership support and making the necessary investments in new AI programs and hardware infrastructure.

Software developers who ignore the potentials of AI in the software development life cycle and stick to routine jobs, which are more reliably and cost- efficiently done by automated routines risk being substituted and losing their established jobs in the long run. In future, software developers will require higher creative potential and have to be smarter to compete with artificial intelligence. Software development businesses rejecting the adoption of AI risk being pushed out of the market by more innovative competitors who realize software products faster and at higher quality by relying on AI support. AI is an emerging future technology in software engineering and early adopters multiply their competitive .

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