



EXPLORING

THE TOP AI USE CASES

HOW ARTIFICIAL INTELLIGENCE IS DEPLOYED FOR PRACTICAL PURPOSES

GLOBAL OUTLOOK

KNOMETRIX MARKET INTELLIGENCE

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Artificial Intelligence is a programmable brain made to think and act like a human. The global Artificial Intelligence market generated a revenue of \$25 billion in 2018 and expected to grow at CAGR of 46.2% from 2019 to 2025. Advancement in AI is real and happening with the technology finding a wide variety of applications in almost every sector.

Exploring some of the practical use cases of Artificial Intelligence

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Predictive Maintenance of Machines



- On an average, organizations lose up to \$140000 in revenue due to data center downtime.
- Maintenance cost in the oil & gas industry ranges from 15% to 70% of the total production cost.
- Poor maintenance has caused the productivity to fall by 5% to 20% in the manufacturing sector
- The ability to predict machine or equipment failure has reduced the spare parts inventories by more than 30%
- Prevention of failure and early detection of machine and system problems increased the operating useful life of machines by an average of 30%

Maintenance is a critical activity in any industry. The Companies' ability to be competitive in low price, performance and provide high-quality goods are influenced by how well the machines are maintained.

Problem Faced:

- Unplanned downtime in the equipment can affect the core business value of the organization and its reputation.
- Amazon in 2013 experienced downtime of close to 48 minutes due to which it suffered a loss of \$4 million in sales

Current practices in Machine Maintenance:

- Reactive Maintenance approach is used to restore the machine to the operating state once a failure has occurred. These methods require no plan as the machine is repaired only when it has failed to operate properly.
- Preventive Maintenance approach is carried out with a planned schedule base on time or the process iterations to prevent breakdown.

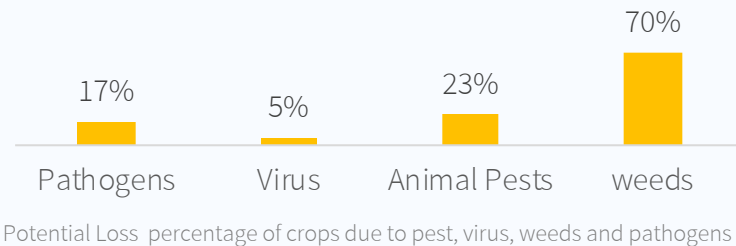
Problems in the current practices:

- Reactive maintenance approach is done once the machine has failed and thus this method tends to cause a serious lag and result in huge repair cost.
- Preventive maintenance may sometimes result in unnecessary maintenance and result in high cost.

The AI Solution:

- The best approach of maintenance which is a trade-off between reactive and preventive maintenance is predictive maintenance.
- The premise of predictive maintenance is that there will be regular monitoring of the mechanical conditions of the machine.
- AI system along with sensors and cameras will be used to inspect the health of the machines daily
- Predictive maintenance will minimize the number and cost of unplanned outages and improve the overall availability of the operating plant.

Intelligent Crop Protection from Weeds & Pests



- AI Drones travelled at a speed of 1.2km/h, with 58.10ms and 37.44ms execution time to find the tomato and weed locations to the spray controller, respectively.

Agriculture sector not only provides food, but it is also one of the major sources for the economy in any country

Problem Faced:

- Millions of dollars spent to protect crops annually. But still, the growth of crops are threatened by insects and pests.

Current practices for crop protection

- One of the methods currently employed is early pest detection so that the crops are protected from further attacks.
- Early detection would help in reducing the usage of pesticides and would also guide the selection of pesticides.
- Sticky traps- used to protect the crops from the pests as these pests get stuck to the traps.

Problems in the current practices :

- Detailed evaluation of the entire field using the naked eye is very difficult
- Higher human resource and experts are needed to examine the field as it is both expensive and time-consuming.
- Sticky traps used to protect the crops from pest to a small extent

The AI Solution:

- An AI system detects pest infestation and classifies the pests based on types.
- Computer vision analyzes the images of leaves to evaluate the current health conditions of the plants/crops
- The images from sticky traps can be processed by an AI system which uses image processing techniques for the detection of pests from the crops and classification algorithms to classify them based on the different properties of the images

Intelligent Recruitment & HR System



- The LinkedIn research on global recruitment trends suggested that 57% of the recruiters tell that the biggest challenge for recruiters is the competition for talent.
- Screening resumes and shortlisting candidates to interview is estimated to take 23 hours of a recruiter's time for a single hire.
- A survey conducted by HRPA found that 84% of HR firms AI was useful tool in recruitment
- Early adopters of AI in Recruitment has seen:
 - Reduction in cost per screen by 75%,
 - 4% increase in revenue per employee
 - Around 35% decrease in turnover

- It is no longer just local competition, but organizations are competing constantly on a global level. As newer technologies are making the world smaller suggesting that companies must update and keep them competitive by using the latest advanced technological developments.
- The HRM activities such as training employees, recruitment take a large amount of time and imply a large amount of paperwork for the recruiters.

Problem Faced:

- Traditional approach of using CVs and conducting interviews are ineffective.

Current practices in Recruitment:

- Several companies have come up with pre-employment assessments which ask the candidates a list of questions. This assessment helps HR executives in selecting the right candidates.
- Applicant tracking system is another approach wherein which software enables the electronic handling of recruitment from receiving resumes to hiring employees

Problems in the current practices:

- The approach of pre-assessment test was incredibly time-consuming for candidates and resulted in lower completion rates due to the effort of completing them.
- Applicant tracking system works great at filtering out unqualified applications, yet the software has sometimes eliminated qualified candidates in the process due to some keywords preferred by the company.

The AI Solution:

- Artificial intelligence makes the selection of right candidates smartly by going beyond the keywords on a resume to determine job fit, it adds context based on reasoning and human input.
- Intelligent Recruitment system can help in gathering the best possible pipelines of candidates for an employer based on the type skillsets, employment and personality traits gathered from various inputs.

AI Analysis on Medical Images



- According to GE, over 90% of healthcare data comes from medical imaging and more than 97% of medical images are not analyzed.
- A research conducted by NHS UK found that AI machines Accuracy rate in medical diagnostics from medical images was 87% as compared to 86% accuracy rate for humans
- **Arterys**, the first company approved by the FDA for the use of deep learning capabilities in clinical applications, has shown that its product can use AI to diagnose heart problems in just 15 seconds while a human would take an average of 30 minutes to an hour to produce the same result.

Medical Imaging is used by doctors to diagnosis any condition or diseases within the human body. Doctors has been using medical imaging techniques like X-ray, CT Scan, MRI scan to diagnose diseases like cancers for many years.

Problem Faced:

- Medical image analysis by doctors are time-consuming which sometimes affect the life of a patient
- Small anomalies are not visible by doctors naked eyes

Current practices in Machine Maintenance:

- Trained physicians visually assess the medical images and report findings to detect, characterize and monitor diseases

Problems in the current practices :

- The assessment by physicians are often found to be based on education and experience, at times, subjective.
- Even the best physicians can miss a minuscule detail in a CT Scan or MRI Scan. Especially, if a doctor focused on finding information on a medical imaging report related to a specific condition, it is completely normal to overlook signs of other unrelated diseases

The AI Solution:

- AI systems have better computational capabilities than humans, so they can analyze medical images faster than medical doctors
- AI excels at recognizing complex patterns in imaging data and can provide a quantitative assessment in an automated way.
- Accurate diagnosis can be made by doctors if assisted by an AI machine

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