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Machine Learning and Artificial Intelligence Introduction

Presented by Miracle Software Systems - January'20

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Innovation. Through Technology.

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Agenda

- Machine Learning
- Predictive Analytics
- CRISP-DM Methodology
- Image Recognition
- Pre-trained Models vs Custom Models
- Prerequisites of Building a Model
- Image Recognition Use Case Examples
- **MASIA - On Device Facial Recognition**

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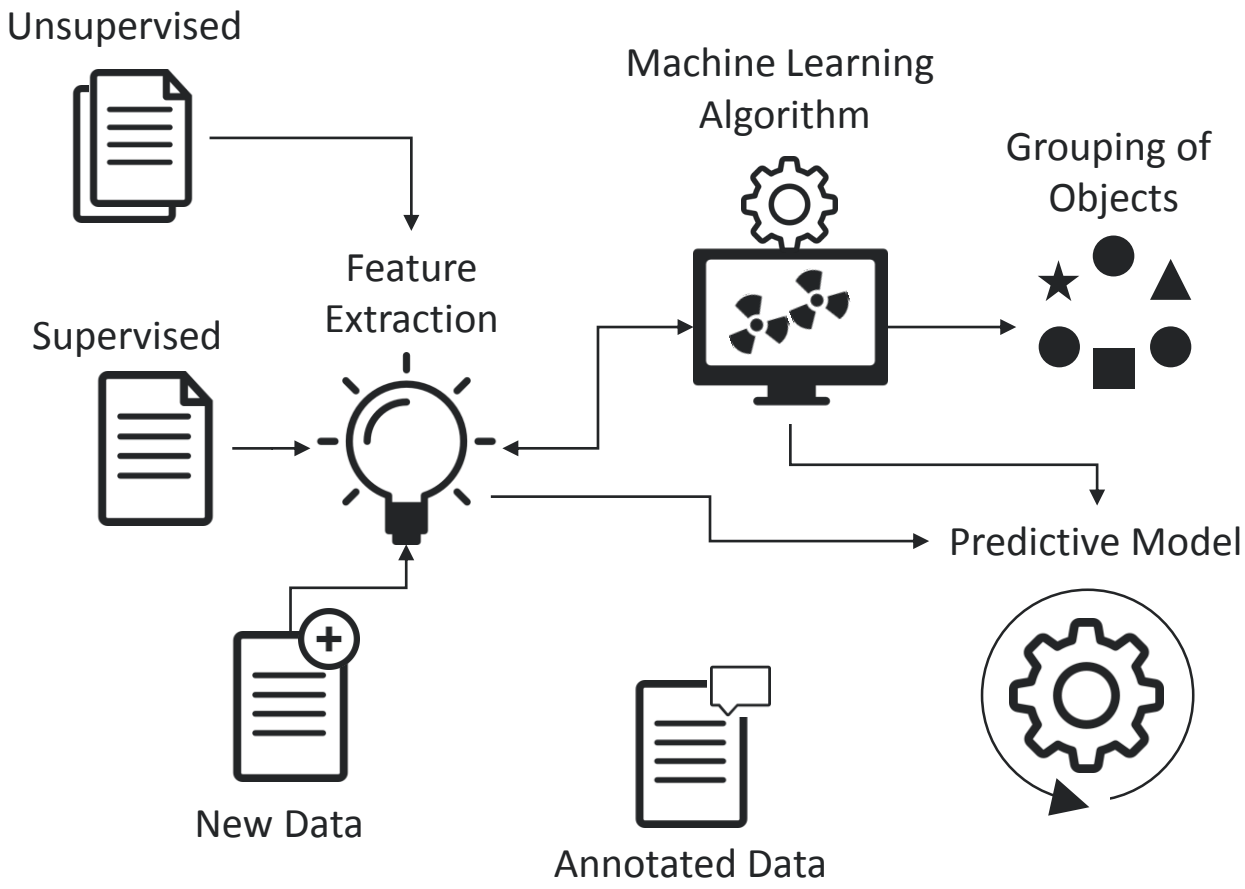
Machine Learning

Machine Learning provides systems the ability to automatically learn and improve from experience without being explicitly programmed.

Types of ML Algorithms

- Supervised Learning
  - Data has Known Labels or output
- Unsupervised Learning
  - Labels or output are unknown
- Reinforcement Learning
  - Focus on decision making based on previous experience



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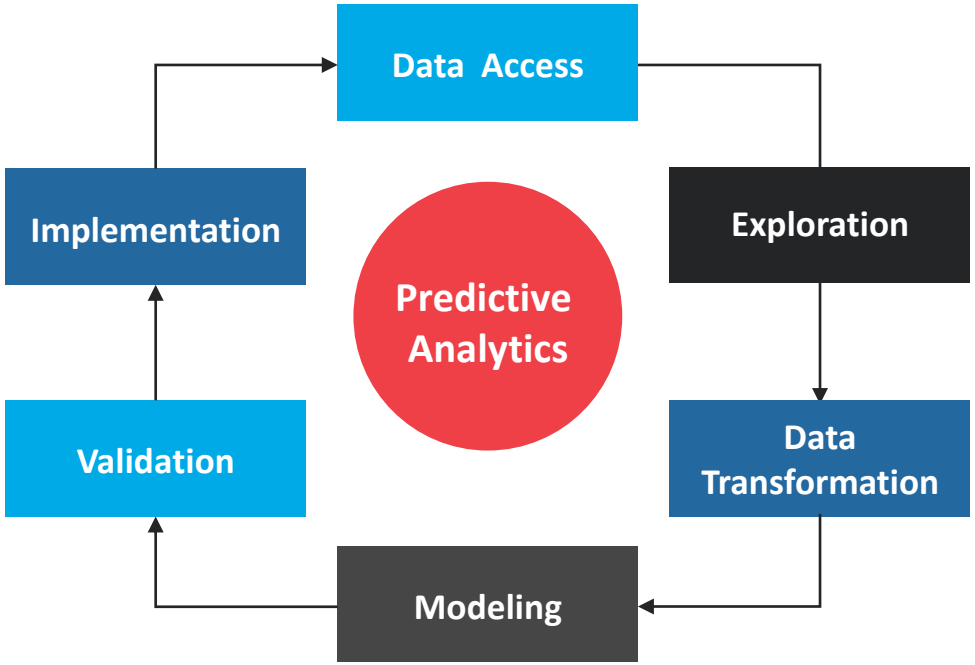
Predictive Analytics

Predictive analytics makes use of data, statistical algorithms and machine learning techniques to identify the likelihood of future outcomes based on historical data

Real time examples - Recommendations, Weather Predictions

We can build predictive models with different tools and programming languages like R, Python, SPSS, SAS, TensorFlow



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CRISP-DM Methodology

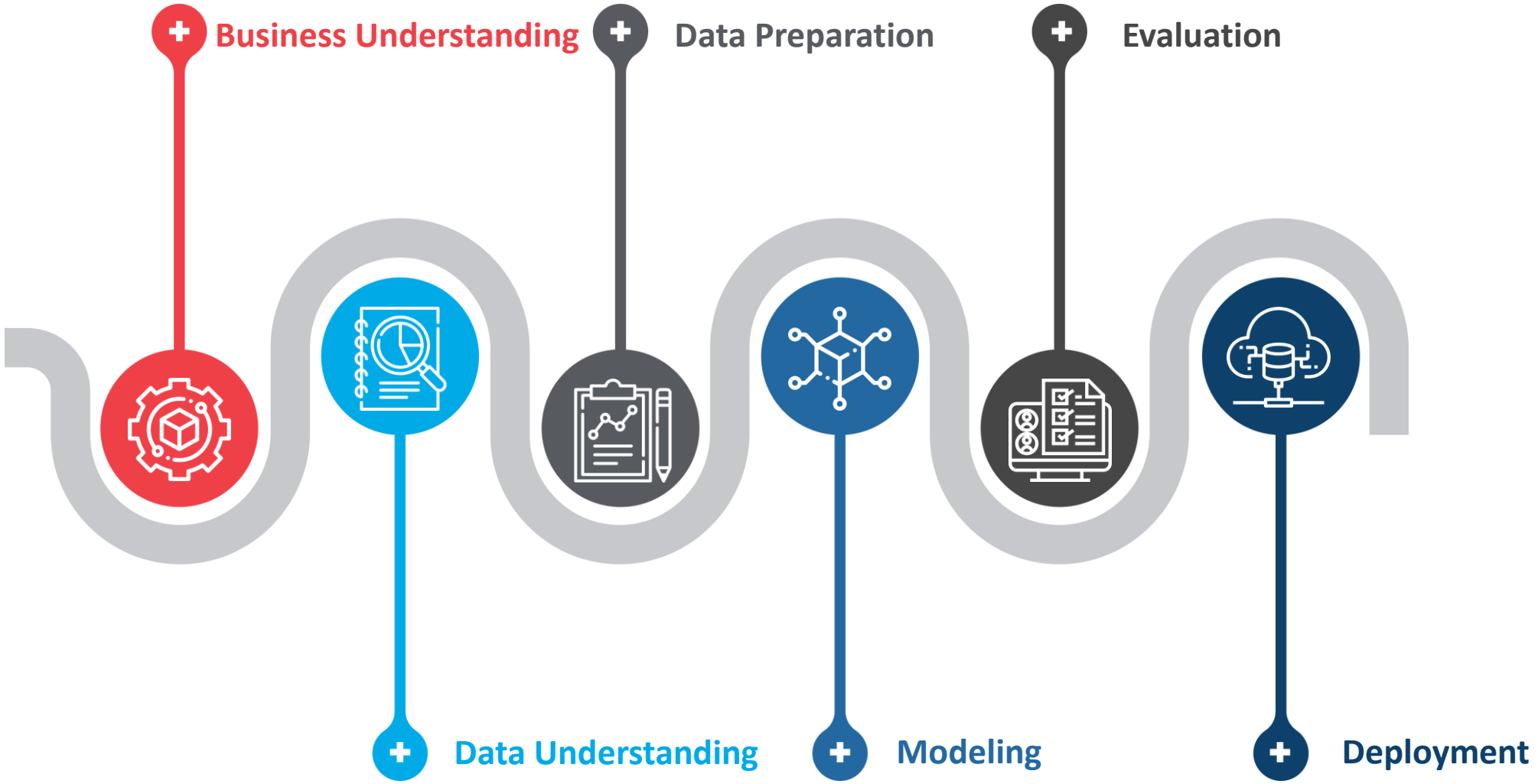
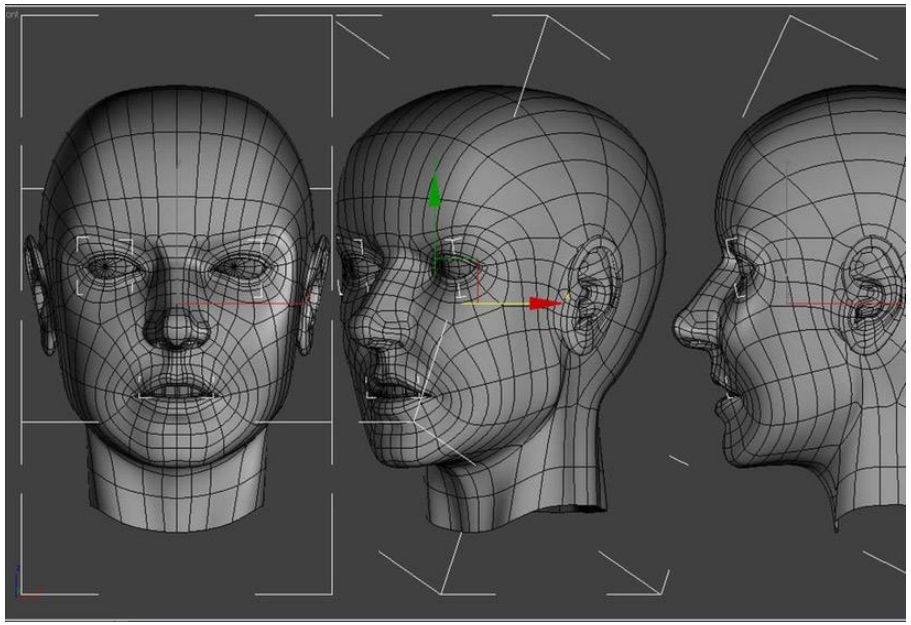


Image Recognition

Image recognition is a technology that strives to acquire, process, analyze, and understand images from the real world in order to produce numerical or symbolic information

When a picture is uploaded on to Facebook, everyone's faces will be recognized and get automatically tagged - that's image recognition



Pre-trained Models vs Custom Models

Pre-trained Models
Built and made public for various purpose
Can be used for retraining or transfer learning
Built on a definite set of dataset available in public repos
Eg: Google’s inception models

Custom Models
Models which need to be built from scratch
Can use pre-trained models for the custom dataset and retrain
Can be built using custom dataset
Eg: Any model which is build according to user’s requirement

Prerequisites of Building a Model

- Understanding the problem statement
- Good Dataset - High quality images, understandable data files
- Data Visualization
- Picking up appropriate Machine Learning algorithm
- Hyper parameters that needs to be taken care of
- High End configured computational machines in case of real time business problems

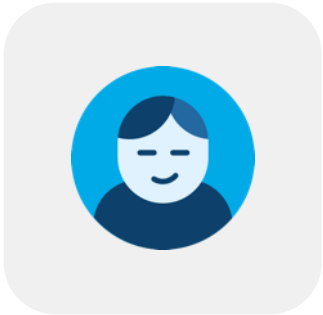
Image Recognition Use Case Examples

Document Matching and Error Detection

Defect Detection on Farm Production Line

Damage/Brand Detection for Vehicles

Wildlife Detection for Oil and Gas Firms



Smile and Login with Facial Recognition

Image and Weight Based Inventory Management

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Product Replenishment Identification in Stores

AI Case Study for Beverage Bottler

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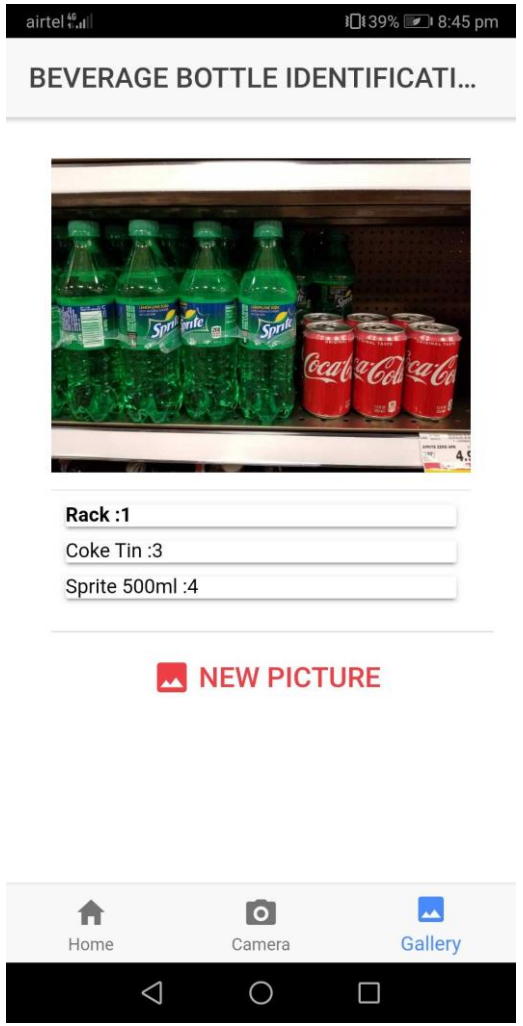
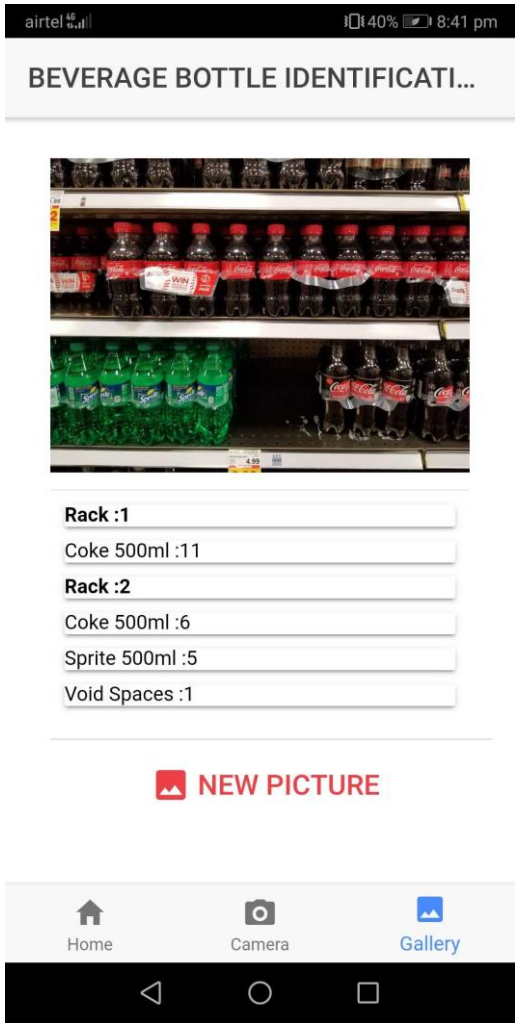
Use Case Overview

- It is always difficult for a Store Manager (or) a worker to check for reduced products in racks of all isles. If the products are reduced in number in a rack, it needs to be replenished immediately
- The main purpose of this use case is to automate the daily monitoring of products in a store. Thus making the work easier in finding out the racks which needs to be replenished with products
- We have created a mobile application which will be very easy to use by store managers (or) workers





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Hands-On Workshop

Building a Classification Model with AWS SageMaker

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Thank you

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