Building an Intelligent System with Machine Learning

- **Phase 1: Problem Assessment -**
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Phase 1: Problem assessment

- Determine the problem's characteristics
- Identify the main participants in the project
- Specify the project's objectives
- Determine the resource needed for building the system.

Phase 2: Data and knowledge acquisition

- Collect and analyze data and knowledge
- Make key concepts of the system design more explicit

Phase 3: Development of a prototype system

- Choose a tool for building an intelligent system
- Transform data and represent knowledge
- Design and implement a prototype system
- Test the prototype with test cases

Phase 4: Development of a complete system

- Prepare a detailed design for a full-scale system
- Collect additional data and knowledge
- Develop the user interface
- Improve the complete system

Phase 5: Evaluation and revision of the system

- Evaluate the system against the performance criteria
- Revise the system as necessary

Phase 6: Integration and maintenance of the system

- Make arrangements for technology transfer
- Establish an effective maintenance program

1. Problem Type

Diagnosis
Inferring malfunctions of an object from its behaviour and recommending solutions.

Selection
Ranking or Recommending the best option from a list of possible alternatives.

Prediction
Predicting the future behaviour of an object from its behaviour in the past.

Classification
Assigning an object to one of the defined classes.

Clustering
Dividing a heterogeneous group of objects into homogeneous subgroups.

Optimisation
Improving the quality of solutions until an optimal one is found.

Control
Governing the behaviour of an object to meet specified requirements in real-time.

2. Input and Output variables and their interactions

Tabular data
- Excel , CSV, SQL …

Image/Video/Audio
- Photos, Aerial Images, CCTV, Dashcam, Phone Records …

Text / Documents / Survey
- Twitter, Facebook, WeChat, CV, Reports, Books, Websites …

Graph Data
- Social networks, Power grid, Traffic, Water, Transportation, GIS …

3D Point Cloud
- CAD, LiDAR Scan, Self-driving Car …

3. Form and content of the solution

All these features are important for data scientists, engineers and programmers to choose and justify their solutions for the problem. They also affect the following steps and phases for building the intelligent system.