Artificial Intelligence
at Critical Software

The Future Is Now

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In any competitive business climate, the need to constantly innovate, learn and adapt is crucial to success. Since 1998, Critical Software's world-class software systems have helped to keep businesses and organisations one step ahead.

The company's contributions to demanding industries like aerospace, transport and energy, and its continuous improvement of software development and systems engineering processes, has allowed it to achieve internationally recognised standards of excellence.

As a company that is always looking ahead, the development of Artificial Intelligence (AI) capabilities is an area that Critical Software recognises is key to finding new ways of tackling existing and future industry challenges. As a result, AI is an area that the company intends to invest in and lead on.

TACKLING CRITICAL CHALLENGES WITH THE POWER OF AI

There are two important critical-systems tasks that are becoming increasingly difficult to process using standard techniques, and which AI techniques are far more efficient at.

The first task is being able to more intelligently analyse data and information in order to provide more accurate, objective and even predictive insights, and to reason more effectively with such information. This enables users to more effectively manage systems with an ever-growing amount of data and information, which humans alone are not as good at doing. Several areas of AI can help with this:

• Machine Learning and Data Mining

• Natural Language Processing (NLP) and Text Mining (TM)

• Knowledge Representation and Reasoning (Ontologies)

• Case-Based Reasoning
The second main area is finding information. Several recent studies have suggested that at least 25% of our time is spent looking for information. In a data-rich and increasingly connected world, with a growing amount of information at our disposal, this is an important challenge to overcome. This is even more important within the scope of critical systems, where the need to find the right information at the right time is often crucial. AI areas important in tackling this problem include:

• Natural Language Processing for QA and Chatbots

• Knowledge Representation and Reasoning (Ontologies) for Information Browsing

• Information Retrieval and Semantic Search Systems

• Recommendation Systems

AI IN BRIEF AT CRITICAL

Critical Software has already been involved in a number of projects that have seen AI applied to solve challenges across the business world.

POINTING MARITIME AGENCIES IN THE RIGHT DIRECTION

Using machine learning techniques in order to learn and identify suspicious or anomalous vessel behaviours and trigger alerts based on these findings. Using clustering and detailed course-use analysis was essential in creating this system.

HELPING INSTITUTIONS TO KNOW WHO THEY CAN BANK ON

Devising client credit scoring and fraud detection mechanisms to help international banks, based on machine-learning techniques.

PROVIDING A CONTEXT FOR CONVERSATION

Developing semantic search techniques for the creation of 'personal assistants' or 'chatbots' in the areas of business intelligence and analytics.

MAKING BETTER BUSINESS SENSE

Using AI to help extract relevant business information from annual company reports to assist in more objective and strategic decision-making processes.

PREDICTING MOBILE NETWORK DEMAND

Using AI to forecast mobile network use in the telecommunications industry, so that the planning of network resources can be more efficiently undertaken. Forecasting algorithms were used on a huge scale to perform this task.

PLUGGING ENERGY COMPANIES INTO THE BIGGER PICTURE

Developing a forecasting solution for a given population's energy consumption, based on a repository of historical information that was processed using machine-learning techniques.