



White Paper 2024-11

Reflections on Artificial Intelligence and Project Control

Artificial Intelligence (AI) is a trendy technology and there are many proposed uses in the field of project control. Some are quite relevant, while others may require additional validation before being adopted. In this White Paper we specifically review the current uses of AI in the field of project control.

How does Artificial Intelligence work?

Artificial Intelligence technology as used nowadays is based on the training of models on past data. Natural language models such as ChatGPT are a specific subcategory where the models are very large and have been trained on massive amounts of data, they allow conversations through chatbots and the generation of content (text, images, videos).

For AI to work in any specific field, it is thus required to first have sufficient past data available to train the model to detect the patterns that we expect to identify in future activities. The conservation of sufficient quantity of clean past project data is a requirement to release the capabilities of AI. It will therefore be easier to deploy AI in an organisation with a large portfolio of projects (and project data) than in an organisation with a very limited number of capital projects. Still, some experiments have demonstrated useful results even with a limited number of training samples, thus the available project database does not need to be extremely large to provide valuable results.

Properly coding and sorting data is a key enabler of project control work. This, and if possible with standardised coding across a portfolio of projects, becomes even more important if AI is to be deployed.

Usage of AI for general project overview at portfolio level

AI can be used on the aggregated project performance data (actual cost, progress, forecast vs budget) at portfolio level to identify early those projects that may become problematic. Training is done on past similar project data, with the outcome of the project known to be satisfactory or problematic. This is a very useful prioritisation tool for large portfolios of projects, provided ongoing and future projects are similar to the ones used for training. Studies have shown that it is sufficient to train AI on a limited sample of past projects to achieve relevant prioritisation results.

Usage of AI for scheduling

Because scheduling uses databases (with limited data for each project update, but full historical records), scheduling data is generally shared between parties, and scheduling has a quite standard data structure with a limited number of industry-wide scheduling tools, it is not surprising that

the most advanced applications of AI are related to scheduling.

Current tools are able to assess the durations of projects or key activities compared to benchmarks, challenge the logical linkages used in the schedules, and provide indications on the potential deviations of the final durations compared to the planned durations. Those AI models have been fed with all the schedule updates of a large number of past projects. The results can be quite astonishing, as long as there are sufficient schedules in the database for similar projects.

In the near future, we can expect that parts of schedules will be automatically generated as a first draft, similar to current practices in the field of programming.

Furthermore, we can anticipate that AI will enhance the productivity of forensic schedule analysis, as well as improve the identification of deviations and cause-and-effect relationships resulting from such analysis.

Usage of AI for estimating and cost forecasting

The usage of AI for estimating and cost forecasting is less developed because the data is more confidential, and there is a much wider variety of tools and standards used throughout organisations. Some major cost and estimating tool suppliers try to put in place AI-driven solutions, however, confidentiality of data may be a major impediment as it is fundamental to each organisation competitiveness.

In that respect, AI solutions in that field can only be effectively implemented if a suitably structured database is available within the organisation with a full traceability and codification of cost items. This will generally require a considerable amount of work recovering and cleaning up past data to have a usable database for AI learning. However, when this is possible, we have seen great examples of machine learning used to simplify estimating the cost of high-value procurement items that need to be purpose made for each project based. Historical data was used of project characteristics and overall cost for the procured items to train the tool. This allowed the company to estimate costs with a high degree of accuracy without the need to obtain proposals in its tendering phase for new projects.

AI will often provide early warnings in a more systematic manner than human monitoring. That will enable project control professionals to concentrate their efforts in analysis and action taking.

Still, we do observe the onset of proposed AI applications for estimating and forecasting. This is probably a field to watch in the near future, in particular if the hurdle of sharing cost databases can be achieved to a certain level without attribution

Usage of AI for contract management

AI is now used widely in the legal field (nourished by large databases of legal decisions) and is becoming more available for contract management. Those models are fed by generic contract management data and are thus quite easily available. They can then be customised to the specific needs of the organisation. Typical usage include:

- Review of contract terms for deviations to expected terms (particularly useful for large portfolios of small projects)
- Facilitation of the redaction of contractual letters
- Automated action generation and tracking from correspondence

It will therefore be easier to deploy AI in an organisation with a large portfolio of projects (and project data) than in an organisation with a very limited number of capital projects

Usage of AI for project risk management

At this stage we have seen only limited usage of AI in this field, possibly because of the lack of standardisation of approaches. Still, one can expect AI to be trained on past updates of risk registers to be able to check the comprehensiveness of a current risk analysis and flag situations where risk rating is far off the benchmark or the observed rate of occurrence.

A particular challenge here may be the need to classify the actual unplanned events that occur in a structured manner and rate the actual (or potential) impact of such events on the achievement of project objectives. Cost of non quality is one way of collecting such data and could potentially be used to clean and structure data for training of an AI tool.

Summary

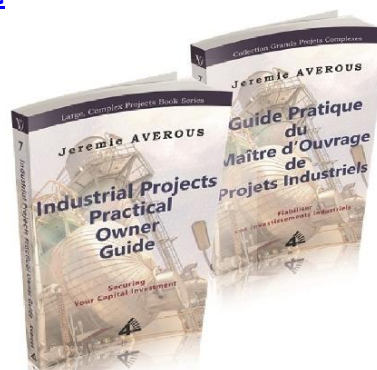
A number of project control areas are now becoming supported by AI tools, in particular when relatively substantial portfolios of similar projects are available to provide a comparison point. The availability of AI tools depends a lot on the confidentiality and availability of data: it is more widely available for contract management and scheduling than for cost estimating.

AI will often provide early warnings in a more systematic manner than human monitoring. That will enable project control professionals to concentrate their efforts in analysis and action taking. Still, final judgment by the project control professional remains required, even if the AI tools do provide a useful insight into benchmarks and comparison points from past projects.

Leveraging AI requires the availability of comprehensive and clean past data. Proper coding and records management becomes even more essential if AI is expected to be used to further improve insight and productivity of the project control teams.

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