The Current State of AI in Project Delivery:
Using AI to overcome the Project Delivery problem

Given every project is different how can AI be used to improve project success? Where is AI likely to truly benefit project management? What mechanisms or algorithms could AI use?   Greyfly's research posed this very question and we have concluded the following answer.

Introduction

Project delivery is a complex problem. There are so many unknowns; it is impossible to completely define all of these upfront. The changing business environment, with technological advances, global competition and regulatory pressures, adds extra complexity. Project delivery is also difficult because it involves people; requiring soft skills to deal with the conflicting needs of stakeholders, team members, vendors and customers. This paper explores the Project delivery problem and how Artificial Intelligence (AI) is being used to overcome it. We will look at the evolution of AI in project delivery and how this has shaped Greyfly's market offering.

What is the real problem?

The Project Management Institute defines a project as a temporary endeavour undertaken to create a unique product, service or result. Project Management is the application of knowledge, skills, tools and techniques to project activities to meet project requirements.
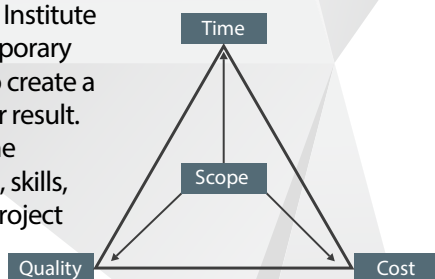
Greyfly have published articles on the causes of project failure that show there are many factors that could impact the time, cost, quality and scope constraints in a project. The project delivery problem could be summarised as **how do we remove the uncertainty from projects, or at the very least reduce it.** Traditionally, a high degree of reliance has been placed on human judgement and expertise to achieve project success, but this is prone to inconsistencies. With the advances in AI, computers can now remove subjectivity and bring more rigor to the project management process.

Artificial Intelligence

AI is seen as the new "silver bullet" for all our technology woes and this includes increasing rhetoric pertaining to the project delivery problem. AI is the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions) and self-correction.

The adoption of AI is beginning to make its mark in industry. Gartner's latest CIO survey of 3,160 CIOs from 98 countries, found that 25% of CIOs are already piloting AI initiatives or have short-term plans for them. Another 21% have medium- or long-term plans.

Evolution of AI in project delivery

The application of AI in project delivery is however in its infancy. The diagram below shows the four phases of the evolution of AI in project delivery.

• **Streamlining:** improving existing processes through better integration and collaboration

• **Automation:** the computer is actually "doing"; replacing human aspects of the project delivery process i.e. performing simple repetitive tasks.

• **Insight & Foresight:** the computer is assimilating project data and providing insights and recommendations to enable prediction of outcomes and better decision-making.

• **Self-directed:** the computer is autonomous; making project decisions and even remediating project issues that occur.
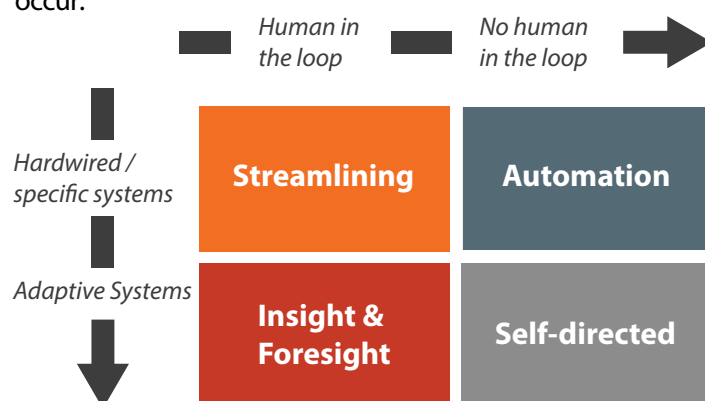
Over time the level of human interaction is reduced as AI in project delivery evolves. Many of the tools, currently developed in this space fall into the first three quadrants (Streamlining, Automation, Insight & Foresight), however Self-directed tools, where the computer thinks, acts and does for itself are on the horizon.

Streamlining

Streamlining: Integration and collaboration

There are 300+ project delivery tools on the market, which perform a variety of tasks, such as scheduling, issue tracking, project portfolio management, resource management and team collaboration. Each tool will have its strengths and weaknesses and many organisations could be using multiple tools.

The first phase in the evolution of AI in project delivery has seen Chatbots being used to provide more streamlined integration and workflow between applications. For

example, chatbots have been developed to integrate, Jira, issue and project tracking software for agile teams, with other tools such as Slack, project team messaging. Through integration, the following efficiencies can be achieved:

• Check calendars of project team members for availability and schedule meetings.

• Send personal reminders for completion of timesheets, logs and other project data.

• Notify project team members if "sprints" (i.e. set time period – usually 30 days - in which a feature is developed and made ready for review) are likely to overrun.

• Generate project status reports.

How does a chatbot do all of this? Chatbots use Natural Language Processing /Understanding to simulate and decipher human conversations.

Automation

Automation: Virtual assistants (Chatbots) that perform simple tasks

The second phase in the evolution of AI in project delivery is Virtual Assistants where Chatbots are used to search through data created by projects to automate repetitive tasks. For example, chatbots which integrate with the Jira can also perform the following tasks:

• Automate issue creation based on instant messages between project team members. The chatbot searches through messages looking for discussions around potential issues. By automatically creating the issue, the risk of issues being overlooked or swept under the carpet is reduced.

• Auto-check for data consistency and completeness. Data quality is a major issue for project delivery. The lack of consistency between project team members data entry limits the value of the data created for a project. This would normally be controlled by implementing project standards, however reliance is placed on humans to comply.

• Auto-check performance. User behaviour or project performance data is collected to determine where productivity can be improved.

While integration and automation improve the efficiency of project delivery processes, where project delivery AI adds the most value is in the next phase of evolution – Insight & Foresight.

Insight & Foresight

Insight & Foresight: Expert Systems, Machine Learning and Deep Learning

The first expert systems were created in the 1970s and then proliferated in the 1980s. Expert systems were among the first truly successful forms of AI software. Expert systems are rule-based, systems designed to emulate a human response to a particular event or action. They replicate the decision-making ability of a human expert. The Expert System is composed of a knowledge base and inference engine. The inference engine applies logical rules to the knowledge base to deduce new information.

The main disadvantage of an Expert System is the lack of creative response and this is where machine learning has the upper hand. Through "training", machine learning algorithms improve their predictions, outcomes and responses over time as more and more data becomes available.

Machine learning is a subset of AI which uses statistical techniques to give computers the ability to learn without being explicitly programmed. Statistical analysis of project data can be performed to gain insights to aid decision-making. The benefits of statistical analysis are magnified when machine learning is applied.

For example, project planning software is available that can learn from project history and create a regression model to provide future estimates of budget and task duration. Project estimation performed by humans is highly subjective. Time, budgets and resources required to complete a task can be more accurately predicted by reviewing historical data, which increases the likelihood of project success.

Deep learning is a branch of machine learning that uses deep neural networks trained on large datasets and is particularly well suited for tasks like language modelling and text classification. Artificial Neural Networks has gained considerable application in construction and engineering projects.

Cyclops, Greyfly's first product market offering is a Project Maturity Assessment tool, which we use as part of Project Assurance engagements to provide insight on how a project is progressing. We work with clients to develop strategies to minimise the likelihood of project failure and use deep learning in voice recording software to capture input and key word search and classification to reduce/remove hours of reading and analysis.

Greyfly partner with clients to prepare their project data for Machine Learning and develop bespoke techniques to address specific project problems. One of the common assumptions is that finding the correct Machine Learning algorithms is the difficult part, however the quality of the data and understanding its limitations is also key.

Self-directed

There are currently no use cases for this final phase in the evolution of project management AI, however it is envisioned that eventually the role of the human Project Manager will change to focus more on strategic aspects, as more of the decision-making is taken over by computers.

Conclusion

AI tools for project delivery are still in the early phases of evolution. Currently, most tools on the market are focused on improving the efficiency of project delivery processes and centred around the use of Chatbots. The use of Machine Learning techniques to offer more insight and foresight is still in the experimental stages. Greyfly are one of the few companies exploring solutions in this space.

Greyfly has developed Cyclops to tackle the real problem of how to reduce the uncertainty in project delivery. Cyclops captures the combined knowledge of our Programme/Project Management experts and utilises that knowledge to aid our clients in their decision-making.

Author

Marcia Williams
Chief Assurance Officer, Greyfly Ltd.

Marcia is an IT Audit Manager with c20 years' experience working in the UK, Bermuda & USA for the "Big 4" consultancies as an IT Auditor/Consultant.
Her focus more recently has been on Internal Audit in the Financial Services sector, where she has been involved in all aspects of IT audit, particularly around emerging technologies. She has been investigating the use of AI in Project Management for Greyfly Ltd. for the last two years.

Seven Foundations for Project Success

Based on this extensive research, Greyfly has established seven foundations for project success.

The Greyfly assurance and delivery framework are built on these seven Foundations to improve confidence in, and the likelihood of, project success.

As well as providing bespoke assurance services, Greyfly also:

• Provides the support and guidance required to deliver assurance improvement plans;
• Assess overall and specific skills and capability and help improve the internal capability;
• Supply knowledge and expert resources, supporting delivery.

Greyfly's increasing development and adoption of Artificial Intelligence (AI) is also enabling faster and better value assessments of assurance and capability.

"We are so pleased to have been successful in our bid to the consultancy framework and look forward to working with the BBC to provide value for money, experienced, results driven consultants who use innovative systems and processes to assure project success."
Lloyd Skinner, Founder & CEO of Greyfly

GREYFLY®

2 Essendene
The Avenue
Clifton
Bristol
BS8 3GF

advice@greyfly.co.uk
0117 909 4148

www.greyfly.co.uk
/company/greyfly
twitter.com/greyfly1

4