



THE CHARTERED BODY FOR THE PROJECT PROFESSION

Exploring Artificial intelligence in Project Management

Project Challenge, 27 September 2022

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APM at 50:
Better projects for
a better future

What we will cover today?

- Context and why this topic?
- What is AI?
- Findings from “AI in PM” research report
- Findings from “Can AI replace project professionals?”
- Resources and future activity

Context: APM PDA activity



THE **CHARTERED BODY** FOR THE **PROJECT PROFESSION**

pm.org.uk/resources/what-is-project-management/what-is-project-data-analytics/

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What is project data analytics?

Keywords

- Project data analytics
- Artificial Intelligence (AI)
- Machine learning
- Big data
- Autonomous agents

Definition

Project data analytics, at its simplest, is the use of past and current project data to enable effective decisions on project delivery. This includes:

Descriptive analytics presenting data in the most effective format
Predictive analytics using past data to predict future performance

Definition from APM Pathfinder Report Project Data analytics: the state of the art and science

Artificial intelligence (AI)
 This refers to the study of 'intelligent agents', autonomous non-human entities that can take in information from their environment and act upon their environment in a way that enables them to succeed in their goals.
 Intelligent agents need to have mastered machine learning and aspects of predictive

Machine learning
 This is the name given to computer algorithms that 'learn from doing'. In project terms, machine learning has, at its centre, algorithms that are used to spot patterns between some characteristic of projects or programmes and some aspect of project performance.
 This process gets more accurate the more

Big data
 This refers to extremely large bodies of data (or datasets). In project terms, this often refers to the historic 'data plumes' of legacy that are created from the use of project control or enterprise management systems.
 Project data analytics (both predictive and descriptive) uses big data in its activities.

Data Advisory Group

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Research

Research

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Project data analytics: the state of the art and science

KEYWORDS

- Project data analytics
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The context

The project delivery profession is in the midst of unprecedented technological innovation. Ever-increasing complex projects and programmes combined with the arrival of new digital technologies offer a wealth of opportunities to improve project performance. Responding to these opportunities is made difficult by the unfamiliarity of many project professionals with the technologies involved and the benefits that can accrue through their use.

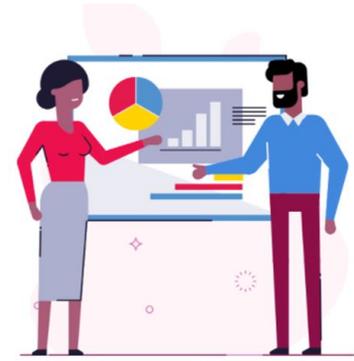
This 'pathfinder' report assists project professionals by bringing together work in project data analytics to give a succinct statement of current progress. It gives a picture of what is happening now in this field gained from interviews with key stakeholders. It highlights the research APM is undertaking in this area to identify future developments of project data analytics. The lack of a common understanding of terms used in this area is acting as a barrier to their adoption so the report begins by giving clear definitions of available digital technologies and the relationships between them. This document will be complemented with a full report on conclusion of its associated investigations.

PDA Pathfinder report and collaborations

Resources



Data analysis and storytelling for project success



Explore how you can use data to your advantage throughout your projects.

Leveraging project data 2 mins

Fact or fiction? 6 mins

What is the difference between...?

Project Data Analytics

Use of past and current project data to enable effective decisions on project delivery.

Includes: **Descriptive analytics** presenting data in the most effective format and **Predictive analytics** using past data to predict future performance.



What is the difference between...(cont)?

Big data

Extremely large bodies of data (or datasets) often refers to the historic 'data plumes' of legacy created from the use of project control or enterprise management systems.

Machine learning

Computer algorithms that 'learn from doing' used to spot patterns between some characteristic of projects or programmes and some aspect of project performance. This process gets more accurate the more it is used.

Artificial intelligence

Study of 'intelligent agents,' autonomous non-human entities that can take in information from their environment and act upon their environment in a way that enables them to succeed in their goals. Intelligent agents need to have mastered machine learning and aspects of predictive data analytics in order to be able to do this. In a project context, some people have speculated that an intelligent agent could enhance or change the roles and status of many project professionals.

Research 1: AI in PM why and how?



AIM

1. This research aimed to study the general perception of AI and the ease of use of AI technology within projects.
2. Identify common themes of AI in projects rather than specific cases of AI in projects.
3. Determine the current state of AI research in project management, propose benefits, challenges and opportunities of AI in project management.

HOW

- Literature review
- Semi-structured interviews
- Survey of nearly 300 project professionals

AI – the emperor’s new clothes?

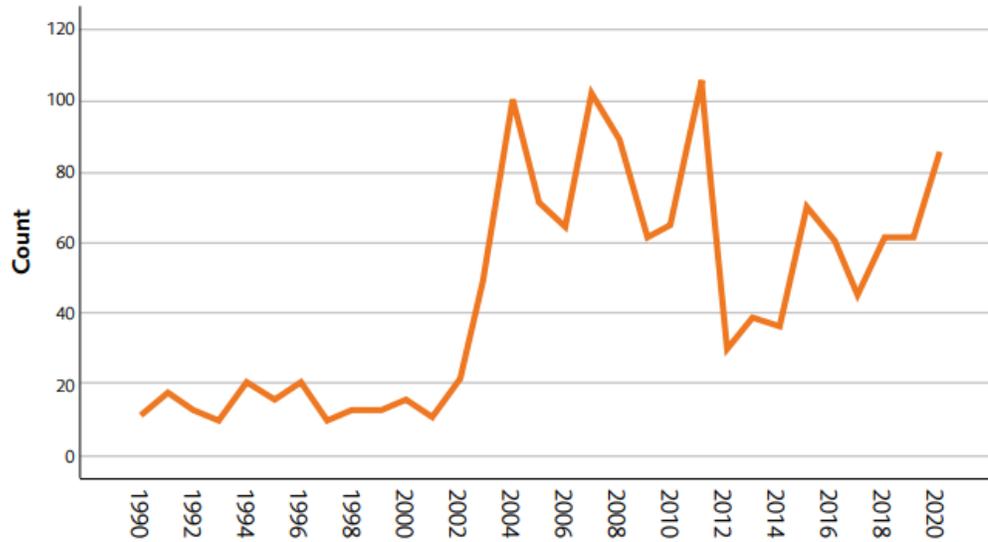


Figure 2: Project management and artificial intelligence publications – Scopus database

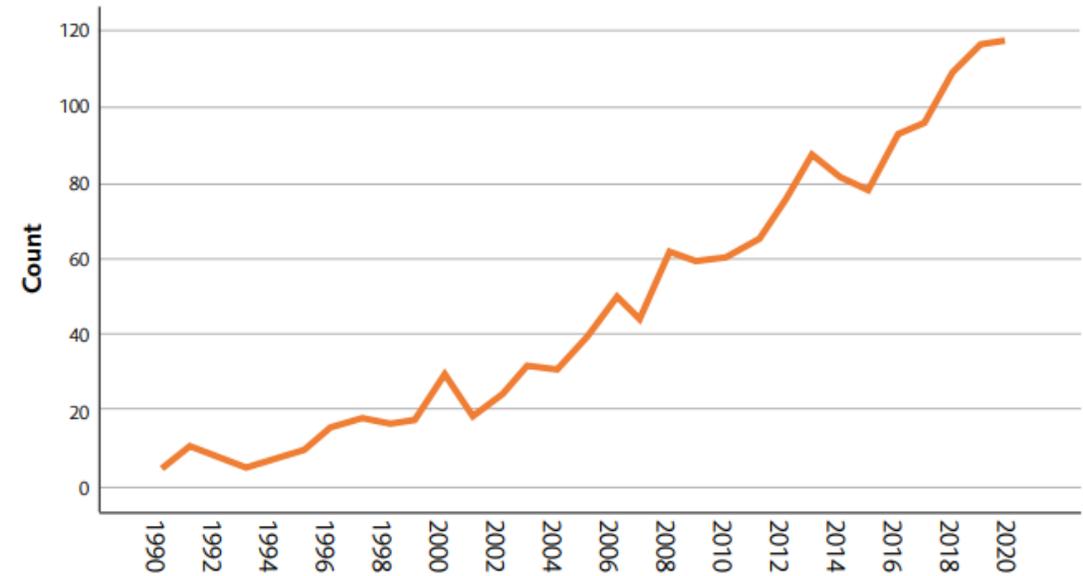


Figure 3: Project data publications – Scopus database

Key findings

1. AI enhances decision-making in projects
2. AI supports problem-solving functions
3. AI is most likely to be used during project planning
4. AI improves efficiency when analysing large volumes of data in projects
5. AI has the potential to increase project success and mitigate project failure
6. Positive correlation between the level of project complexity and the perceived usefulness of AI – “complex projects consist of many unknowns which are increasing all of the time...Using AI technology reduces some of the unknowns.”

Suggestions for project professionals and organisations

1. **Offer AI training** - key for organisations' senior management to focus on increasing professionals' AI skills.
2. **Create a 'why' for using AI** - justify why AI is necessary through an organisational 'why' - setting the correct expectations and create a common purpose for using this technology.
3. **Define a clear AI problem formulation** – to enable better use of resources for data management and identify suitable AI techniques for solving specific problems.
4. **Develop effective data management processes** – including sharing data between internal project teams, managing historical project data and using external project databases.
5. **Create an open learning AI environment** - project professionals don't find AI easy to use and project organisations should aim to make AI more accessible by creating an open and inviting learning environment where learning about AI is encouraged across the whole organisation

AI in PM - Summary



- Provides insights into the critical conversation about the role of AI technology in project management. For individuals the current low use of AI in projects opens up opportunities to get ahead of the competition and gain valuable skills before the technology becomes widespread.
- The report's findings indicate that it is likely that the use of AI will increase over time as AI training is offered to professionals and AI technology becomes more widely available. The professionals that recognise its opportunities and potential early on are likely to be the ones that demonstrate its increasing value and implement its use for positive project outcomes.

Research 2: AI and project professionals

Can artificial intelligence learn to be a project professional?

Potential implications for the professional status of project management



Association for Project Management
June 2022

AIM

“80% of project management roles will be eliminated by 2030...” (Gartner, 2019)

What are the implications of this for human project professionals?

To what extent can we ‘un-blackbox’ project management as a profession – **Can AI learn to be a professional project professional?**

1. What does ‘professional’ mean to project professionals?
2. What is the information in project management that cannot be digitalised as the input for AI to deliver project management professional practice?
3. What are the distinctive, defensible project management actions or competences fundamental to status as a profession that are beyond the output of an AI?

HOW

Literature review, structured interviews and focus groups.

Findings – Project “profession”

- Profession of project management is described as the mastery of ‘hard’ tasks, ‘soft’ skills, professional principles and ethics, providing a sense of community and a career booster.
- Findings indicate early adoption of AI appears to be augmenting the predictive analysis and data sorting functions of human project managers (hard tasks category).
- What separates project professionals from people who simply manage projects and the machines that might, are the principles and values which translate into project/business outcomes in their daily work. These are the most ‘defensible’ competences that cannot be easily replicated or substituted by AI.

Findings – implications of AI

- **Project professionals currently regard AI as having an assistive role** in project management due to particularly around big data and to simulate project performance, but mainly passive, rather than having ownership of any decision-making process or directly organising project team members.
- **AI is unable to fully replicate the competencies of a professional**, especially when it comes to ethics and responsibilities to the community of clients and peers.
- **Human project managers observe professional conduct in their workplace and learn it from experience, a process which cannot be fully digitalised.** As professionalism is a learned behaviour, anything that impacts the ways in which project managers learn to be professional will affect professionalisation and the status of human project managers.

Recommendations

- **Demonstrate and develop codes** of ethics, particularly around the negotiation and convincing of clients
- Motivate project professionals towards **ethical conduct and soft skill development**
- **Develop and reward the use of soft skills in the workplace**, particularly motivation and recognition of peer excellence
- **Master data management skills** to create better data sources as data quality can impact both human and AI development
- **Master basic AI knowledge** in order to maintain control of and work with AI and deliver successful projects
- **Strengthen senior–junior relationships and peer-learning approaches**, building mentorship between senior and junior project managers within an organisation
- **Promote new learning opportunities for juniors**, especially if the more routine activities become digitalised

What next for APM around this topic?



- LinkedIn live featuring authors and participating organisations – winter 2022
- The use of AI in Lessons Learnt research report (University of Sheffield) – early 2023
- Insights studies around understanding how PDA and AI can be implemented in BoK8
- Collaborations and events with partners including project associations, organisations, HEIs, research initiatives such as Project X and via our Data Advisory Group amongst others
- Potential future research

Where to go for further information?

For Project Data and AI visit:

<https://www.apm.org.uk/resources/what-is-project-management/what-is-project-data-analytics/>

Research at APM (www.apm.org.uk/research)



APM RESEARCH FUND SERIES

Value of assurance management practices

A research project investigating the design and implementation of the distinctive practices of assurance management as a service in project based organisations and how organisations determine the level of the investment in assurance management

Association for Project Management
April 2022

Research Funding and publications

RESEARCH: SUMMARY SERIES

Precursors to engaged team leaders in virtual project teams

Josh Iorio and John E Taylor, *International Journal of Project Management* 33 (2015) pp. 395-405

KEYWORDS

- Virtual project team
- Geographically distributed area
- Distributed team
- Transformational leadership
- Transactional leadership
- Technological medium of interaction

Article highlight:

The researchers set up four 'virtual' project teams of graduate students (in architecture, engineering and construction sectors) based in two geographically distant universities, to work on a virtual project over a period of twelve weeks. Data was obtained from the participants' interactions and statistically analysed to investigate how prior experiences – of working in a distributed team and use of technological media – affected their performance in more traditional aspects of leadership. The researchers tested five hypotheses about the contribution of prior experiences to engaged leadership, and found evidence in favour of all five.

What does the paper cover?

Virtual teams, with members located in geographically distributed (separate) areas or countries, are increasingly common organisational structures in project based industries, such as architecture, engineering and construction (AEC) which, as they become more global, seek optimal performance in terms of costs, skills and logistics.

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Q&A

