Ai - Hype Or A Real Potential For Project Management

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Agenda

- Approach
- Definitions
- Types of AI
- AI and PM
- Current Status / Solutions
- Findings
- Challenges
- Conclusion
- References

Approach

- Literature review (semi-systematic / integrative acc. to Snyder, 2019)
  - articles, papers and books
  - Last 5 years
  - Google Scholar, Web of Science, emeraldisight, Nebis, ScienceDirect, Scobus
  - Key words: «AI and PM», «AI in PM»
  - Check of references -> additional sources (older)

Hype AI

- Hype Cycle of Emerging Technologies, 2016

Source: Gartner (July 2016)

Definitions of AI

- "Artificial intelligence: the science and technology of making intelligent machines." John McCarthy, 1956
- “Most of what we consider AI today is really our own intelligence re-formatted and re-cycled, with the help of computers lacking any skill of learning or consciousness of being” (Gurkaynak et. al, 2016)
- Codifying tacit knowledge is difficult as human body is part of the experience -> AI lacks self-awareness and reflection (Sangzoni et. al, 2017)
- "the ability of a system to correctly interpret complex and unstructured external data, learn from and adapt to that data, and use those insights to achieve specific goals and objectives" (regardless of sector, company type, etc.) (Bhalla et al 2020)

Types of AI

- Artificial Narrow Intelligence (ANI) ~ weak AI
  - Execution of single tasks, e.g. chess or classification of an image, Siri
  - In real time, information from specific data set
- Artificial General Intelligence (AGI) ~ strong AI
  - General intelligence of a machine
  - Understands and learns cognitive task like a human being
- Artificial Super Intelligence (ASI)
  - Exceeds human intelligence
  - Ability to have emotions and relationships (Bhalla et al 2020)

AI and PM

First Articles in 1987 - William Hosley

- Opportunities for AI applications in the project management process using expert systems:
  - Preparing a business justification for the project.
  - Building an effective project team.
  - Selection of project team leaders.
  - Determining specific training needs.
  - Developing a list of project concerns.
  - Selection of project planning software.
  - Creating an optimal project schedule and budget.
  - Performing a value and risk analysis.
  - Designing for quality, safety and reliability.
  - Diagnosing and resolving technical and personal issues.

AI and PM

Focus on construction projects

- PM functions: Goals, planning, time, control
- Different systems: decision support, averaging, knowledge-based interactive graphics systems
- Require manual work and historical data (Levitt & Kunz 1987)
- Automation of project planning and control
- Computer at the time still expensive, use only useful for large construction projects (high degree of standardization)

Further developments

- Planning and control using CPM and PERT based on algorithms
- Measurement of success using Generic Algorithms (GA), Fuzzy Logic (FL), and Neural Networks (NN)
- Dispute resolution using support vector machine (SVM), FL
- Use of AI in agile projects, automation of administrative tasks using Natural Language Processing (NLP).

Current status

Focus on automation to date

- Requires a certain degree of standardization
- Of tasks that are already being performed
- Budget updates and their integration with budget forecast reports
- Interaction between MS Project Online and Wunderlist to create and schedule tasks
- Using online templates and workflows, e.g., in Slack or MS Sharepoint, to save time and improve quality of data
- Sending alerts when potential budget or scheduling issues are identified for the project

Project assistance via chatbots

- Fireflies.ai is an AI bot for Slack that analyzes conversations within Slack and detects tasks
- Stratejos.ai sends reminders to team members, tracks their performance and allows the project manager to recognize the best members

Project Management Platforms (Burger, 2017)

- ZiveBox - determines how long a task should be, checks productivity of team members
- Rescoper - automatically schedules tasks based on workload and task duration; issues alerts for budget and schedule issues
- ClickUp - assigns tasks to the best team member; visualizes notifications and updates; predicts deadlines that will not be met; accurate task time estimates
- Polydone - Kanban-based PM system, based on 1-day tasks -> better forecasting, automation of various tasksTranslated with

Findings

Common messages regarding AI and PM:

- Highest effects on cost, schedule and risk management are expected (Jonsdottir, 2020)
- Reduce inefficiencies and manual repetitive tasks – planning, budgeting, resources… (Butt 2018)
- Optimise efficacy, track key metrics, predictive analytics – (Belharet et. al 2020)
- Low awareness of AI among project managers (Butt 2018, Jonsdottir 2020)

Density map (Davahli, 2020)

knowledge Areas	Project Management Process Groups				
	Initiating	Planning	Executing	Monitoring and Controlling	Closing
Project Integration Management	15 papers in prediction of effort and success factors	No paper	No paper	6 papers in decision making and dispute problems	No Paper
Project Scope Management		2 papers in collection of requirement		No paper	
Project Schedule Management		8 papers in developing schedule		3 papers in schedule control	
Project Cost Management		8 papers in cost estimation		8 papers in cost control	
Project Quality Management		No paper	No paper	1 paper in quality control	
Project Resource Management		No paper	1 paper in team development	1 paper in resource control	
Project Communications Management		No paper	1 paper in communication management	No paper	
Project Risk Management		6 papers in risk planning	No paper	No paper	
Project Procurement Management		No paper	No paper	No paper	
Project Stakeholder Management	No paper	No paper	No paper	No paper	

- Literature review (2000-2019): 652 -> 58 papers
- AI models: Support vector machines, neural networks, genetic algorithms

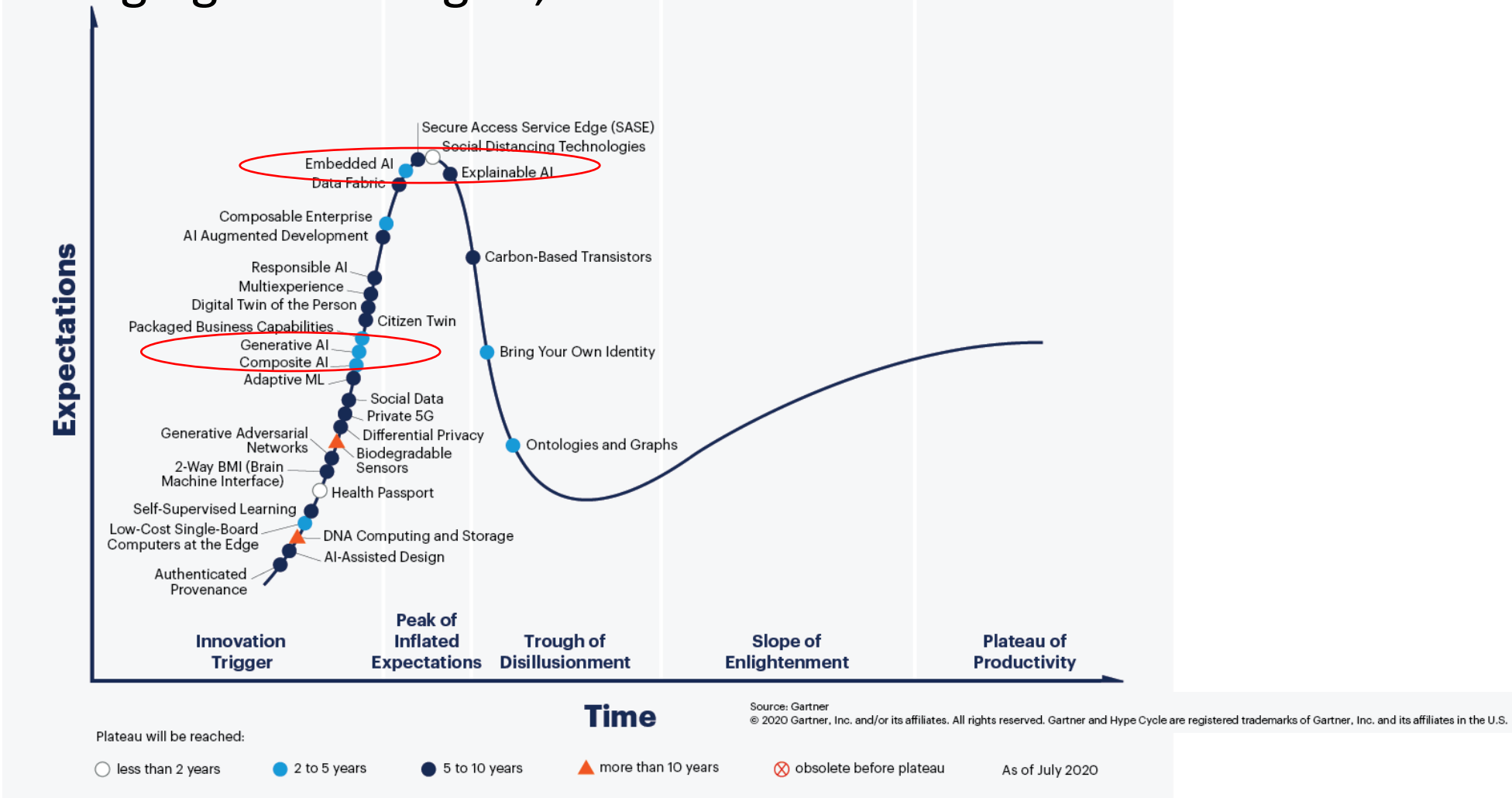
Challenges

- Large amounts of data required
- Nature of projects (unique, limited, etc)
- Data quality: based on expert opinions, subjective assessments
- So far mainly automation of processes, no intelligence!
- Risks: Data privacy, legal imputability, security, autonomy, equity/bias, transparency, trust (PwC, 2020)
- Majority of PMs see advantages, so far low awareness and implementation

- The PM will not be replaced for the time being, rather assisted
- AI is not human
- Focus of PM on (PWC, 2018):
  - Leadership
  - Stakeholder
  - Communication
  - Empathy
  - Emotional intelligence
  - Negotiation

Hype AI

- Hype Cycle of Emerging Technologies, 2020



Conclusion

- Still a hype and lot of hot air
- Automation than Intelligence!
- Low awareness and implementation of AI in PM
- AI projects are part of company digital transformation (Brock 2019)
- Marketing, operations, manufacturing, procurement
- Majority of project managers see advantages of AI
- Tendency that soft skills become more important in the future
- Particular IT related skills seem not necessary

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