



Artificial Intelligence impact in Project Management

October 2020

About IPMA

IPMA is a federation of 72 Member Associations (MAs). Our MAs develop project management competences in their geographic areas of influence, interacting with thousands of practitioners and developing relationships with corporations, government agencies, universities and colleges, as well as training organizations and consulting companies.

IPMA has spread from Europe to Asia, Africa, the Middle East, Australia, and North and South America. The demand for our products and services and the number of our Member Associations is steadily growing. Through IPMA, project management practitioners from all cultures and all parts of the world can network, share ideas, and move our practice and our stakeholders forward through effective collaboration and cooperation.

Find out more at www.ipma.world

About PwC

At PwC, our purpose is to build trust in society and solve important problems. It is this focus which informs the services we provide and the decisions we make. With offices in 157 countries and more than 276,000 people, we are among the leading professional services networks in the world.

We work with our stakeholders to build trust in society and solve important problems. From developing new technology solutions to address our clients' challenges, to helping people build digital skills, to enhancing the quality of our services, and much more.

PwC Romania's purpose means working with others to help address the biggest issues facing the world in a way that builds trust. For our people, this means living our purpose in all their daily interactions. One of the most pressing challenges today is the growing mismatch between the skills people have and those needed for the digital world. We're committed to tackling this challenge and encouraging others to join us.

We are on a digital transformation journey marked by key investments in technology and a focus on upskilling our people. Our aim: to use the combination of people and technology to be the most relevant organization for our stakeholders and one of the most cloud enabled organizations in the world.

IPMA commissioned PwC Romania to jointly conduct the Global Survey on Artificial Intelligence Impact in Project Management and developed a research approach for baseline findings regarding the project management profession.

Table of contents

Foreword	04
Executive summary	05
1. Introduction and methodology	09
2. Socio-professional demographics	13
3. AI adoption in project management	21
4. AI adoption drivers and barriers	31
5. Perceived AI impact in project management	36
6. Emerging project management paradigms due to AI adoption	45
Conclusions	47
References	48
Acknowledgements	49

Foreword



Jesús Martínez
Almela
President, IPMA

“Which will be future trends and drivers of changing careers and job roles of project management team members stretching out into the future with AI adoption? Will be the AI the opportunity to a receptive workforce for Project Management and Project Managers? Many of us keep wondering about what will be the necessary competences to lead projects in the era of AI because the implications related to adoption of AI are significant.

In many companies, they will involve transformation-level changes to core business processes and creating new ways in which people, with different capabilities, will work together with robotics. Beyond individual competences as well organizational competences and project governance addressing project management culture as organizational behaviour will be key drivers and barriers for AI adoption. And this research provides relevant data that will undoubtedly help us answer these questions and challenges. Many thanks, with my deepest recognition and congratulations to whole PwC-IPMA research team as well to all the participants for their contributions.”

Jesús Martínez Almela - President IPMA



Gabriel Voicilă
Digital Technology
Partner, PwC

“The time when AI was just a theoretical study work for computer sciences university students is long time over. The advent of AI and its application to an ever increasing field of work is undisputed nowadays and it is becoming ubiquitous both for individuals as well as organizations.

As a long time Project Manager practitioner, I knew that the most important job for a Project Manager was to communicate effectively with all project stakeholders and manage their expectations. In many cases that meant to interpret and present project data in various shapes and forms. These days, projects are becoming more complex and project data is generated exponentially, and where there is data, AI will for sure have a role to play. But letting AI permeate through the fabric of the Project Manager’s job is not without challenges and will require organizational and behavioural changes and will raise additional questions that the practitioners will have to answer.

I am very happy that IPMA trusted PwC to conduct such a study and I extend my warmest Thank You to the joint IPMA-PwC team who has conducted this research.”

Gabriel Voicilă - PwC Romania Digital Technology Partner

Executive summary



The journey has started

Artificial intelligence (AI) is changing the business world, through the usage of different intelligent systems, including: digital assistants, deep questioning and answering, machine vision and many others. As humans and machines collaborate more closely, and AI innovations come out of the research lab and into the mainstream, the transformational possibilities are staggering.

Considering the disruptive power of AI, the study of AI adoption process is becoming more and more relevant. Several studies were already undertaken aiming to identify the associated factors acting as drivers and barriers, challenges that the organizations should face with and the impact on the overall performance. But only few studies are focusing on the AI adoption in managerial activities, and, especially, in project management.

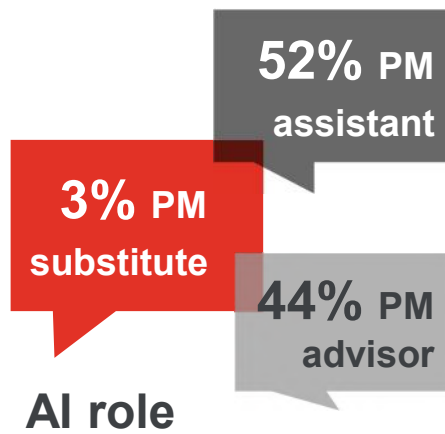
AI isn't just a new set of tools. It's the new world. From automation to augmentation and beyond, AI is already starting to change everything

AI can also be used to analyse disparate and 'big' data with greater speed and deriving to actionable insights. In this way, in a world moving with such a rapid pace, empowerment is coming to improve the speed, quality and accuracy of major decision-making processes.

In this report, we highlight insights of how AI will transform the practice of project management and examine the characteristics of future project managers and organisations. Next steps should be defined for the organisations "today" to prepare for "tomorrow" where AI and humans will work together, creating the capability of a system to take advantage of environment to achieve a goal.

The journey has started. How do you see it?

Explore the current views of the potential impact and the future possibilities and opportunities for the project management professionals reflected on **seven dimensions** that suggest the future direction of approaching Artificial Intelligence today. Openness and adaptability appear alongside technology to be the way forward.



Increased flexibility and responsiveness
is the main change in the project work triggered by the AI technologies

56%
of the organizations already have a **digital transformation strategy** which includes AI adoption

- Top 3 approaches to develop skills to use AI**
-  Formal education and training
 -  Hiring specialised professionals
 -  On the job training

The AI technology with the highest potential for improving the project management:

Machine Learning



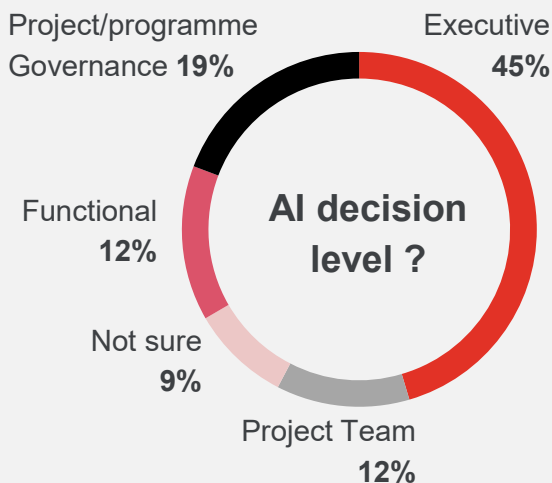
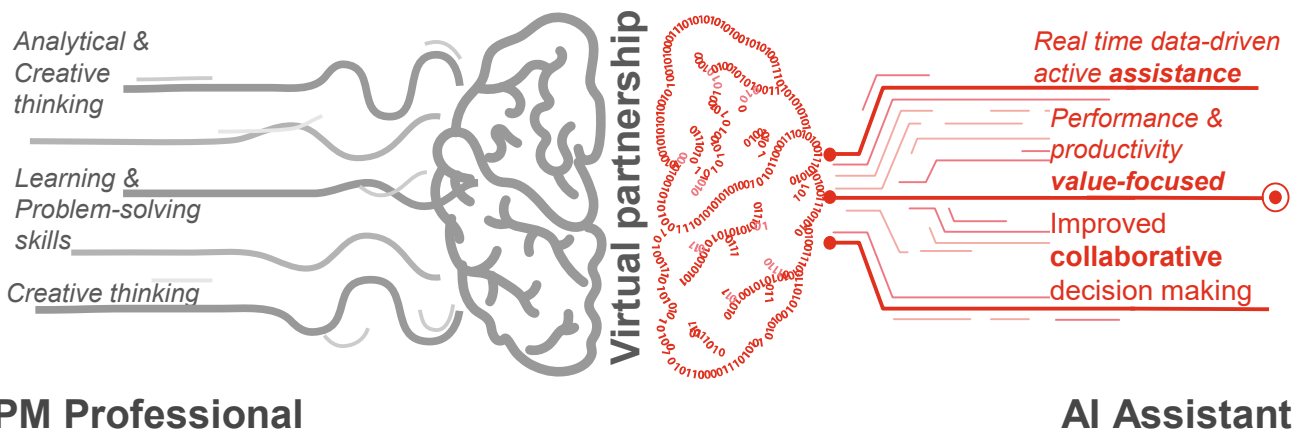
- Top 3 reasons identified for AI adoption in PM**
- 1** Improved decision making
 - 2** Increased levels of productivity
 - 3** Better performance and reporting

61%
professionals are currently using in their projects a mix of **traditional and agile** methods

- Five key non-IT skills required for using AI in project management**
1. Analytical thinking
 2. Creative thinking
 3. Problem-solving skills
 4. Learning skills
 5. Strategic thinking

Virtual partnership Man and the machine

Project management has evolved over time, by adding value to organizations. **Man and the machine**, together facing the large-scale challenges named ‘technological breakthroughs’ – are raising both profound opportunities for business and people. In particular, Artificial Intelligence (AI), will have a huge impact on the role of the project manager also.



Who decides there is a need for AI?

Only 9% of respondents are still uncertain regarding where the decision should occur, but for almost half of respondents (45%), the Executive is seen as the right level of decision, followed by 19% which consider the project or programme governance level as the right decision body. Functional level was selected by 14% and only 12% consider the project team as the proper level for implementation decisions.



Introduction and methodology

Introduction and methodology

The adoption of AI technologies leads to significant changes in business rules, organizational culture and overall performance. Even though several studies were undertaken in order to identify the main drivers, barriers and impact adoption of AI technologies in business, the embracing of AI in management, in general and, more specific, in project management (PM) processes is still not yet well estimated.

The global survey conducted by IPMA and PwC Romania has as main objectives:

- the identification of the perceived status of AI adoption in management and project/programme management;
- the evolution of AI adoption in different project management activities;
- the main factors influencing directly and indirectly (as mediating factors) the AI adoption decisions in PM;
- the main barriers in the AI adoption in PM;
- the main AI methods and tools applied in PM.

\$15.7 trillion — that's the global economic growth that AI will provide by 2030, according to PwC research. Who will get the biggest share of this prize? Those who take the lead now.

Target group

Artificial intelligence (AI) research has explored a variety of problems and approaches since its inception, but for the last decades the progress was enormous. As evaluating capabilities in these area, there is now a broad consensus that AI and its impact on society is likely to increase.

The role of the Artificial intelligence in project management within organizations is changing, mainly in the way that it provides its stakeholders with insights based upon a range of data sources. In this report we explore the trends and projections for how project management functions need to adapt to the newly trends and what if the impact of Artificial Intelligence.

The target group of the global survey was represented by professionals working in organization running projects, programmes and portfolios.

The following categories of professionals were considered during the analysis of collected data:

- A** Professionals undertaking project management related roles, such as: project /programme manager/director, project management associate, project team member, specialized project management roles (scheduler, risk manager, etc.), project/programme sponsor, portfolio manger/director, and PMO manager/director, This category is shortly referred in the report as PM-related professionals.
- B** IT/IS professionals directly involved in AI solutions development or other non-AI software systems and tools. This category is shortly referred in the report as IT specialists.
- C** Agile leaders, functional managers and executives. This category is shortly referred in the report as AL and E&F category.

For the analysis purpose, the respondents were also grouped into the following two categories:

- Professionals working in companies using AI solutions
- Professionals working in companies not using AI solutions or not knowing if AI is in use.

Research method

There are many interrelated variables that are relevant to arriving at a good understanding of the future of AI, in particular the path towards general AI, with varying degrees of informativeness. The method used in this research, besides analysis, included expert survey.

In this year's survey, we asked respondents across the world and across different business functions about adoption, benefits and barriers of AI for each of activities where AI is used. The results suggest that AI is delivering meaningful value to companies and individuals, as well. The survey took place between March-July 2020, covering the responses of 295 project management professionals, including IPMA members and future members and PwC contacts. The survey covered over 35 questions, one linked to another in a logical flow, conducting to conclusions summarized in this document, as an attempt to lay out some topics that we think will be most useful to shape the future impact of AI. The present document is giving a direction , while similar future efforts will be focusing on identifying ideas that can help maximize the benefit of AI. We hope this research will be a helpful source of perceived benefit of AI in day-to-day activities.

The insights in this report are based upon the global survey jointly conducted by IPMA and PwC as well as on several interviews and roundtables conducted with members of IPMA and other interested parties and the results of a survey.



Socio-professional demographics

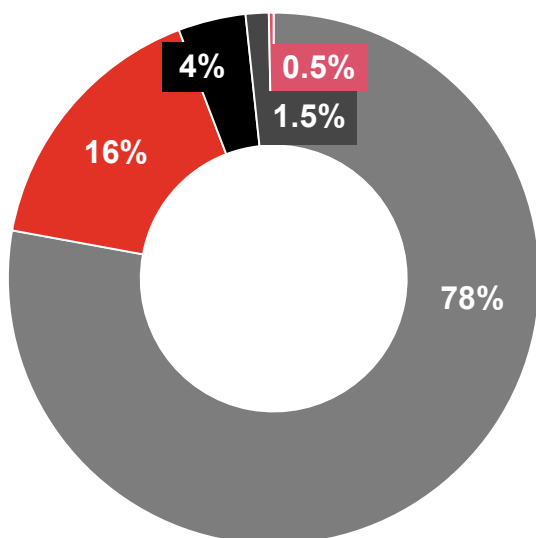
Region, industry, professional role and status

AI is not a single technology, but rather a collection of technologies that are applied to specific tasks. The questionnaire tried to capture collective views, by covering different regions, people, industries and roles in order to create a glimpse of the future of AI in project management. The survey asked respondents all over the world about their knowledge and perception and about almost 2/3 of them were working in roles within technology and business services industries, while 1/4 of respondents are embedding project management roles into their standard business processes. Agile, as day to day practice, is already embraced by a proportion of the respondents.



Region where respondents are currently working

Over 75% of the total 295 participants in the Global Survey live in Europe followed by 16% which are in Asia and Middle East, 4% from America, 1.5% from Australia and less than 1% from Africa.

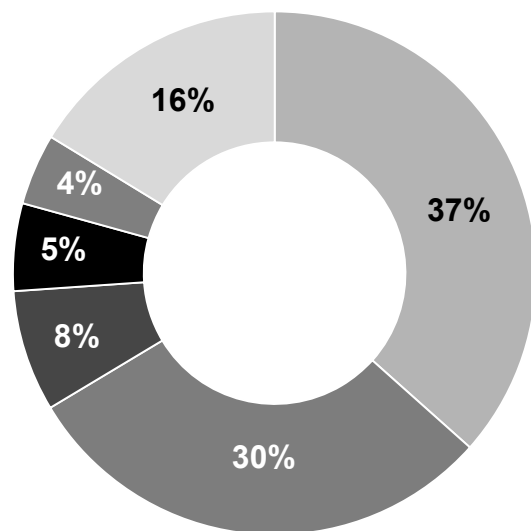


- Europe
- Asia and Middle East
- America
- Australia
- Africa



Industry and work experience of the respondents


37% of the respondents are working in technology followed by 30% in services, 8% are working in engineering and construction, 5% in automotive and 4% in government and public sector, the rest of 16% work in energy and utilities, manufacturing, healthcare, agribusiness




- Technology and Telecommunications
- Business and Financial Services
- Engineering and Construction
- Government and Public Services
- Automotive
- Other

Region, industry, professional role and status

The results suggest that most organizations have already begun to adopt AI in their businesses, attracting qualified personnel. 40% of the respondents say they hold a PM certification and almost ¼ of overall respondents have embedded at least one AI capability in their business processes, this means piloting AI. Still, there remains a lot of potential to use AI across companies, due to opportunities in many industries.

 **Which of the following is close to your current role?**

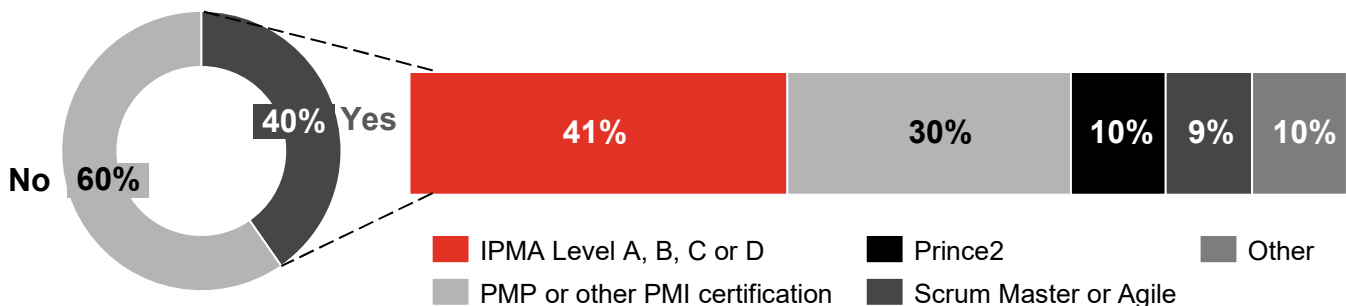
In terms of roles within the organization, 54% are represented by professionals working in project management related roles, 24% of the respondents are currently working as IT/IS professionals which includes solution architects, AI professionals, developers and testers. The executive, functional managers and AI leaders have represented 22% of the total participants in the survey.

 **Which of the following statements best describe you?**

86% of the responses came from full-time employees, 10% are currently in freelancers and only 4% are working as part-time employees



 **Do you hold a PM certification?**

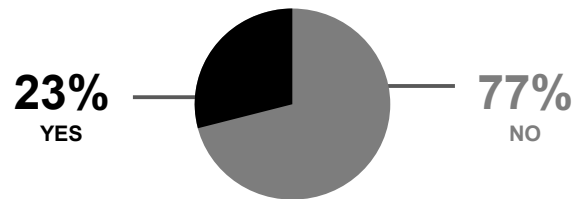


AI experience, readiness, motivation and empowerment



Do you have experience in using AI technologies in project management?

To take advantage of AI's enormous potential to make more efficient the operations, the results confirm, most organizations have a long way ahead to scale up the value.



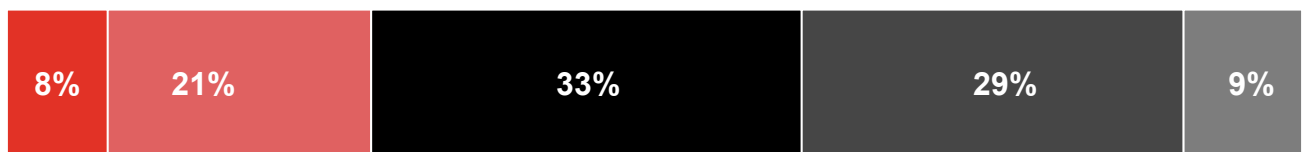
The fact that only 23% in total of the respondent have experience in using AI and to embrace the change the adoption of AI seems still in its early stages.

Going into more detail, only 18.31% of IT specialists declared that they have experience in using AI technologies in project management, in comparison with 27.27% of AL and E&F category and 23.42% of the PM-related professionals.

Only 32.72% of respondents working in organizations using AI in projects and 11.28% of those working in companies which are not using AI in projects declared that they have experience in using AI in project management.



How would you rate your readiness for AI?



not at all ready don't feel ready neutral feel ready feel extremely ready

An interesting fact was that there are not significant difference in the declared degree of readiness between the respondent working in companies which are using AI in projects (42.12%) and those working in companies which are not using Ai in projects (36.84%).

51.47% of the respondents having experience in using AI in project management declared that they are ready and extremely ready for using AI in comparison with only 34.80%% of respondents without experience.

The differences between feel ready and feel extremely ready is small at AL and E&F category (18.18% and 19.70%) comparing with other categories of respondents.

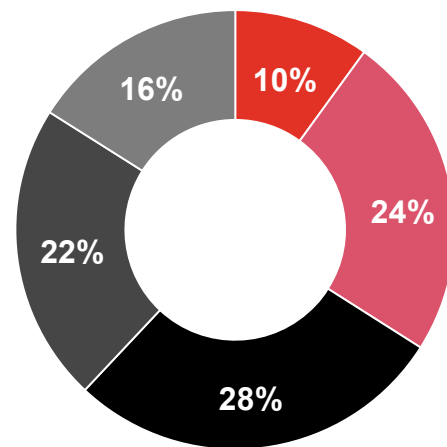
AI experience, readiness, motivation and empowerment

The survey reveals that AI adoption is meaningful in terms of “empowerment” rewards. When respondents were asked about the value of empowerment and when it comes to driving decisions in implementing Artificial Intelligence technologies within project management, the results are encouraging: 34% of the respondents have the perception of empowerment or are extremely empowered, 28% are remaining neutral and 38% don't feel empowered or feel not at all empowered.

However, empowerment is important in performing accelerated steps towards implementation.



Do you feel empowered to drive decisions about implementing AI technologies in PM?



26.76% of IT specialists and 14.56% of PM-related professionals declared that they feel not empowered to drive AI adoption decisions, in comparison with only 6.06% of AL and E&F category.

In the same time, 51.52% of AL and E&F category declared that they feel empowered or extremely empowered to drive AI adoption decisions, in comparison with only 23.94% of IT specialists and 30.38% of PM-related professionals.

39.51% of respondents working in organizations using AI in projects declared that they are feeling empowered to drive decisions about AI adoption, in comparison with only 26.32% of respondents working in companies which are not using AI in projects.

55.88% of the respondents having experience in using AI in project management declared that they are feeling empowered and extremely empowered, in comparison with only 26.87% of respondents without experience

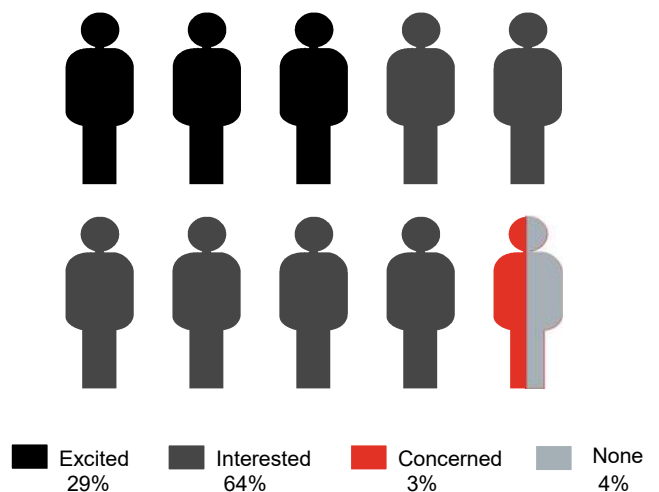
AI experience, readiness, motivation and empowerment

Regarding the feelings about using AI in PM, 10.61% declared that they are concerned about this, comparing with 1.9% of the PM-related professionals. IT specialists declared that they are not concerned about this. In the same time, 86.36% of AL and E&F category declared that they are excited and interested in AI usage in project management , comparing with 94.37% of the IT specialists and 94.30% of the PM-related professionals.

33.33% of respondents working in organizations using AI in projects declared that they are feeling excited about AI adoption, in comparison with only 23.31% of respondents working in companies which are not using AI in projects.

44.12% of respondents having experience in using AI in project management declared that they are excited about AI adoption, in comparison with 24.23% of respondents without experience in AI usage.

Your feelings about using AI in project management?

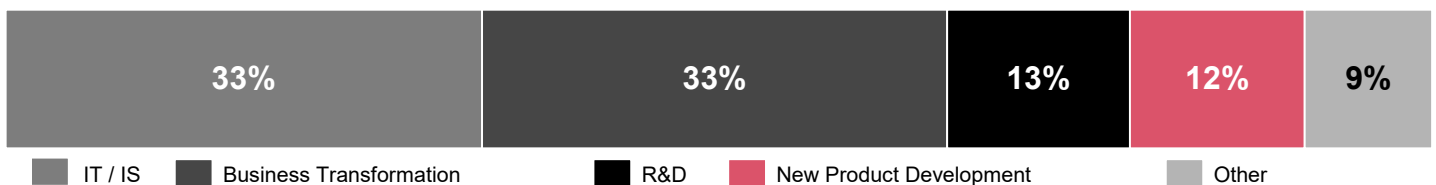


Professional work context

One critical enabler of AI is a company's progress on its digitization. Most of the organizations are in different stages of business transformation, depending on IT enablement. Digitizing core business processes, transforming day to day activities are also prerequisites of AI adoption for the near future.

What type of projects do you deliver? To this question, the majority of responses highlighted a concentration of over 66% of project activities in IT (33%) or business transformation type of projects (33%) which are carried away using a mix of traditional and agile methodologies and only 13% are still using only the traditional methods such as Prince2 or PMP.

Type of projects deliver by the current organization



Project management methodology or methods most used in your organization



Professional work context



Does your organization use programme and portfolio structures for managing projects?



Yes No I don't know



Does your organization have project management office (PMO) and other support structure for project management?



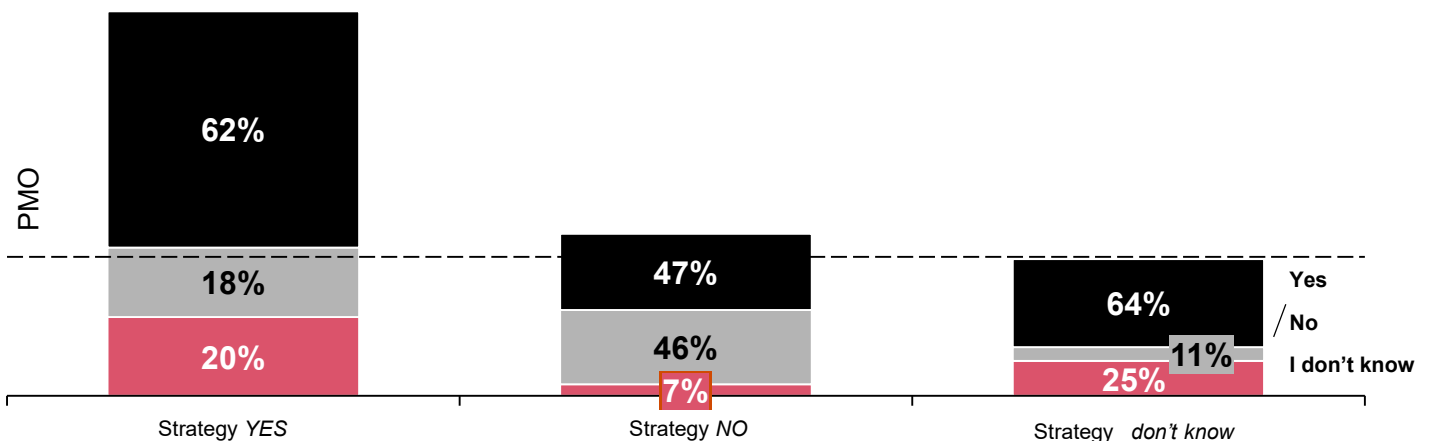
Yes No I don't know

Another interesting fact was the large number of respondents which confirmed the existence of managing structures for programme and project portfolio management within their current organizations. In the same time, 59% of respondents say their organizations have PMO, with almost 1/5 of overall respondents not being aware of the existing of such structure.

Analysing the responses, the conclusion that can be arisen is that an overwhelmingly part are expecting AI investments to increase in the coming years.



Relationship between Strategy and PMO





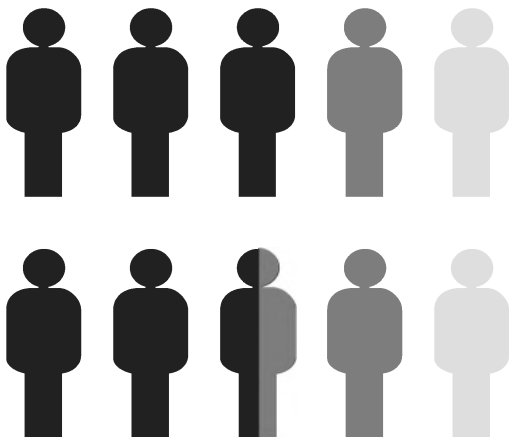
AI adoption in project management

AI adoption status and AI solutions already in use or planned to be adopted



Does your organization have a digital transformation strategy, including AI adoption?

A significant part of respondents of about 56% are stating the fact that they know about the digital transformation strategy within their current companies and that it has a AI adoption component. However, 24% these companies still don't have such a strategy.



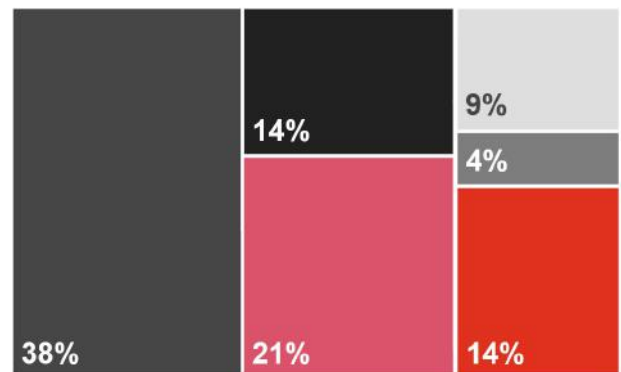
■ Yes ■ No ■ I don't know

The responses indicate that the existence of a digital transformation strategy is associated with the AI usage in the organizations. 82.53% of the respondents working in organizations with a digital transformation strategy indicated that AI is used in the organization.



Does your organization use AI technologies in projects?

When it comes to Artificial intelligence technologies used in projects, although only 4% are currently using at large scale AI technologies, a total of around 65% have either a plan to implement AI in the next 3 to 6 months or are already stated this journey with three main type of solutions being mostly tested or used in equal proportions: Predictive Analytics Tools, Chat Bots (Digital Assistants), Robotic Process Automation (RPA).



■ Yes, we are at the beginning of this journey
 ■ Yes, there is good progress
 ■ No, but in plan for the next 3-6 months to start
 ■ Yes, at large scale
 ■ Not in plan
 ■ I don't know/I am not sure

AI adoption status and AI solutions already in use or planned to be adopted

In the same time the survey analysis showed that 78.57% of the respondents working in organizations without a digital transformation strategy have indicated that AI is not in use in their organization.

Almost half of the respondents (44.07%) have declared that they are not aware if the organization has a digital transformation strategy and they also declared that they don't know if AI is in use or not in the organization.

54.92% of the respondents declared that they work in organizations which are using AI in projects in some extends (at large, in a good progress of adoption, at the beginning of AI

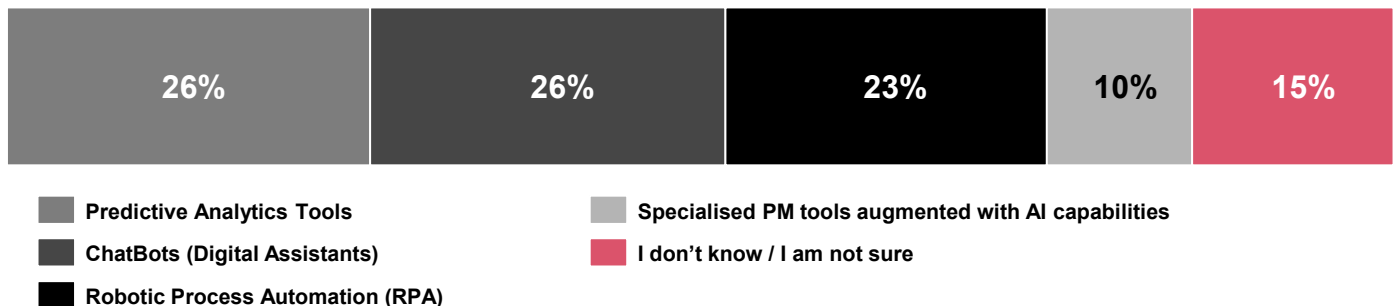
adoption) and 45.08% of respondent that they work in organizations which are not using AI in projects or they don't know if the organization is using this kind of technologies in projects.

“There could be a transformation regarding automating several processes within in projects. Additionally, there is a lot of potential in supporting decision-making with augmented analysis of different types of data.”

PM Academic Researcher,
Germany



AI solutions currently used or planned to be used in project management



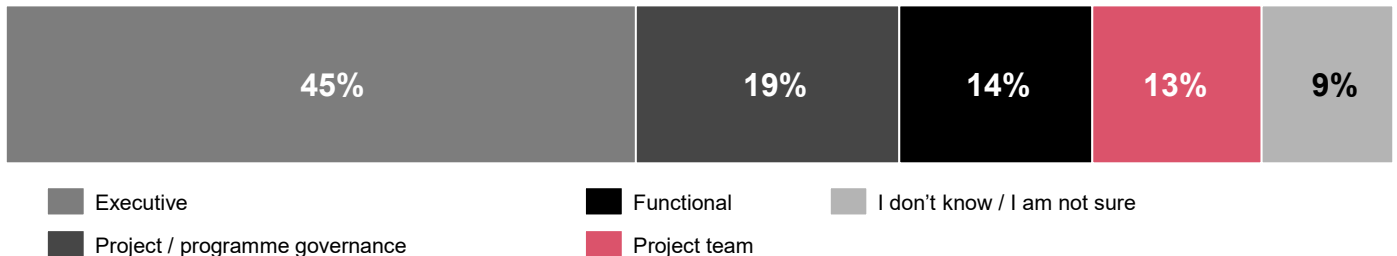
Level of AI adoption decisions

An important characteristic of AI adoption is the decision level that gives the pace of change to the company's progress. In terms of decision level the respondents (45%) are seeing the Executive as the right level of decision, followed by 19% which consider the project or programme governance level as the right decision body. Functional level was selected by 14% and only 13% consider the project team as the proper level for implementation decisions. And for only 9% of professionals it's still unclear where the decision should occur, clear strategy and mechanisms of communication of AI technologies, should be developed.

But without a strong decision to create a digital backbone for each company, the implementation of AI technology can transform the company in a visionary one or a laggard one.



The level at which should be made the decision regarding the implementation of AI technologies



There are differences in how the allocation of responsibilities for AI decisions as perceived by the respondents coming from companies which have a digital transformation strategy in comparison with those coming from companies which don't have a such strategy. The last category of respondents indicated a more centralized decision system than the respondents coming from organization with a such strategy in place.

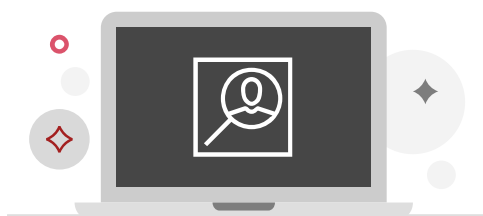
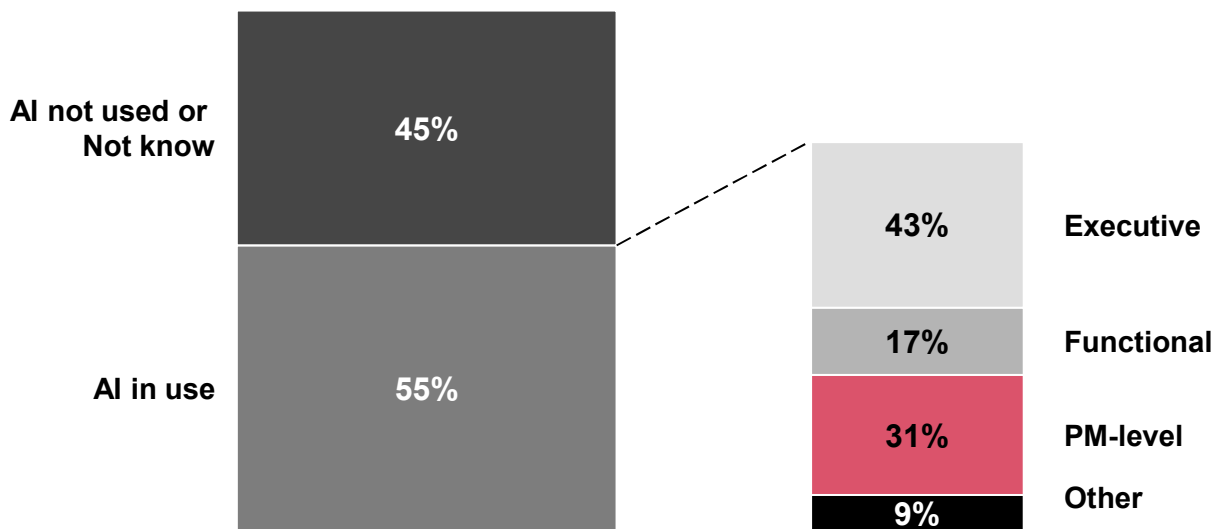
46.39% of respondents working in organizations with a digital transformation strategy in place indicated the executive level as the place where the AI adoption decisions are taken, in comparison with 52.86% of the respondent working in organizations without a digital transformation strategy. 14.46% of respondents working in organizations with a digital transformation strategy in place indicated the functional level as the place where the AI adoption decisions are taken, in comparison with 11.43% of the respondent working in organizations without a digital transformation strategy.

Level of AI adoption decisions

It can be considered that the digital transformation strategies adopted in different organization leave usually more responsibilities at the PM level than it is the case of organizations not having such strategies in place.



Level of decision in relation with AI Usage in organization



Level of decision

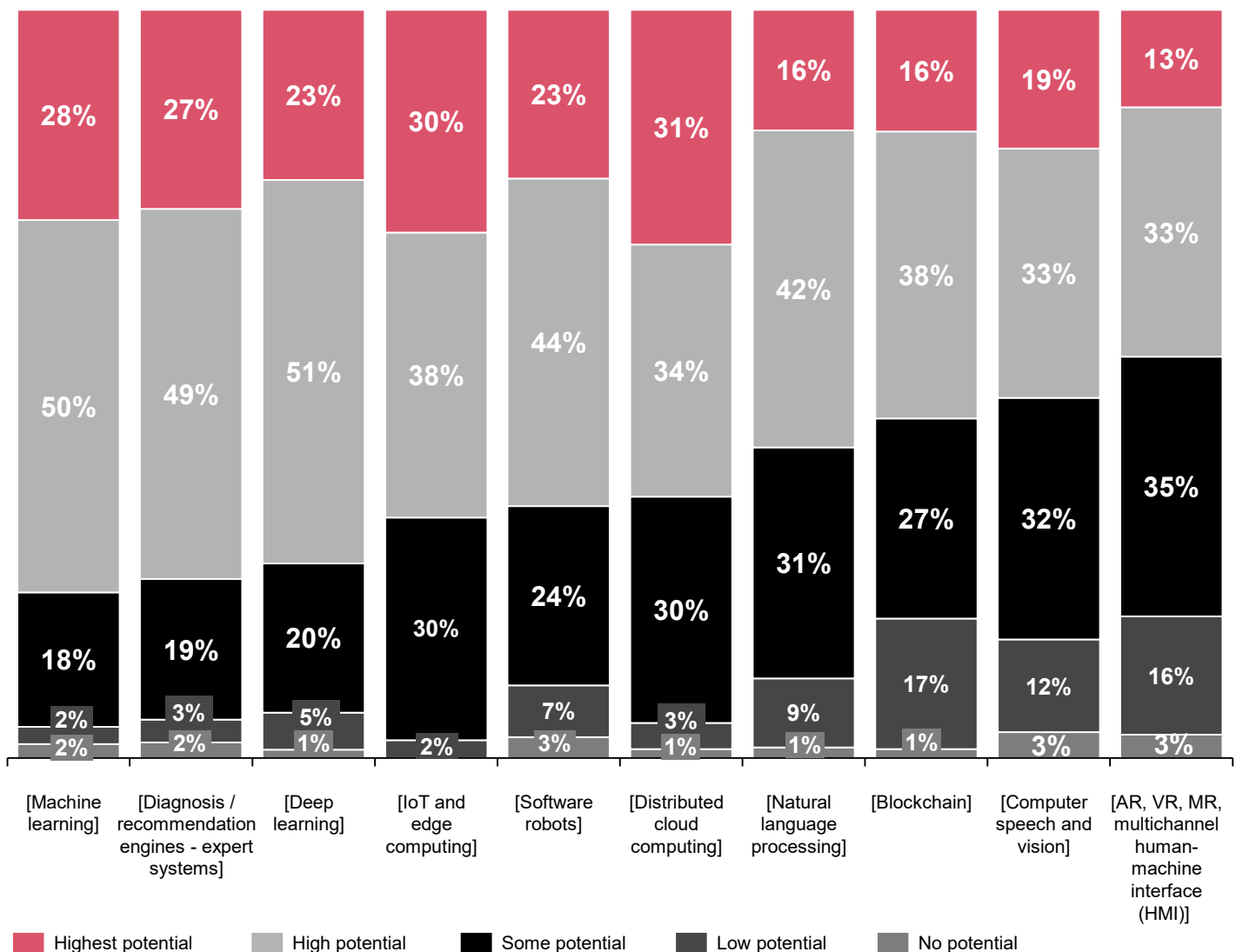
Within the organizations which already adopted AI technologies in more than 60% of the responses indicated that the AI adoption decision are taken by executive and functional manages, which highlights also the importance of cross organizational effective commutation and the level at which the AI decision is made.

Perceived AI potential by type of AI applications

In terms of AI technologies with the highest potential of improving the project management practice and overall delivered projects, as expected the first three technologies ranked with high or highest potential are machine learning (78%), diagnosis (76%) and deep learning (74%). An interesting fact was the high percentage received by Blockchain and AR/VR technologies which scores were the highest with over 18% of low or no potential for improving PM practice.



AI technologies according to potential for improving the project management



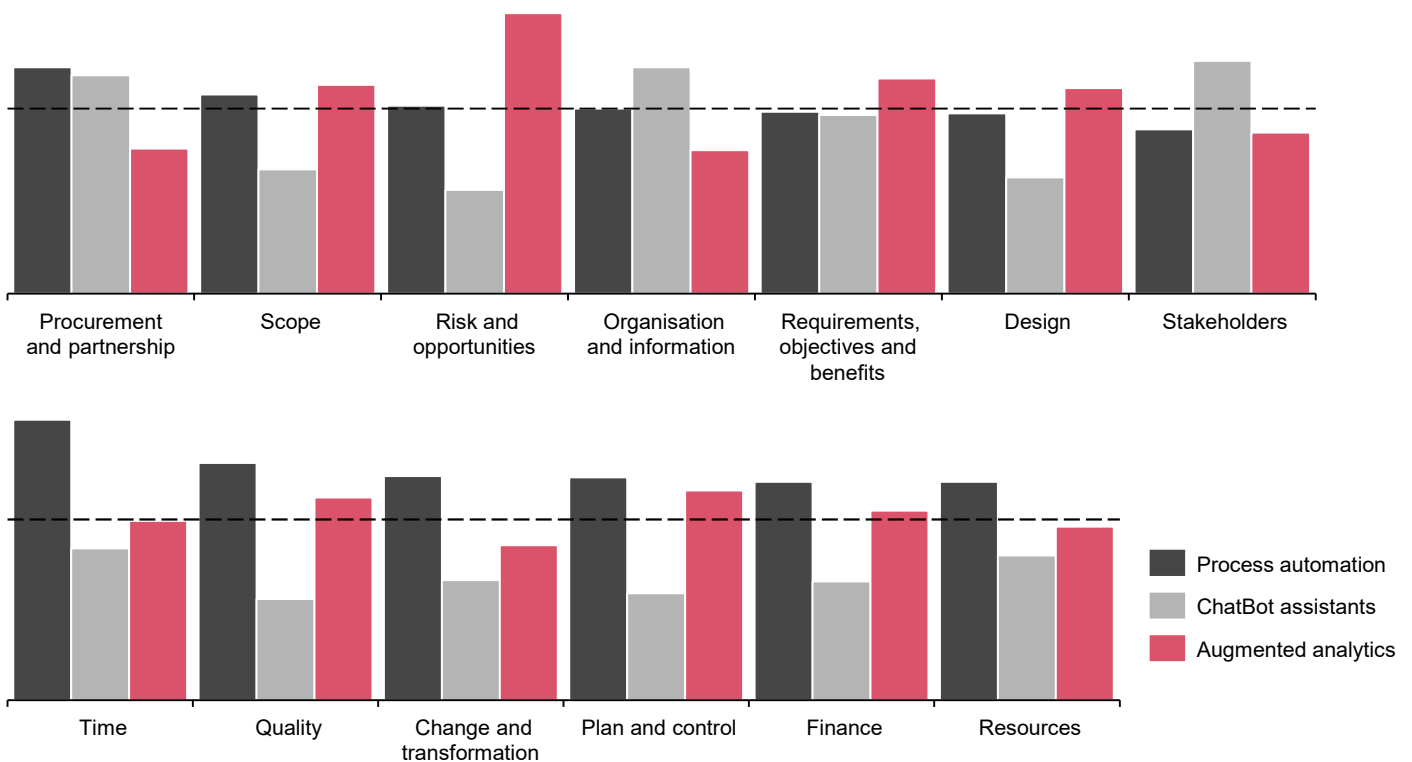
Perceived AI potential by type of PM processes

Respondents are rooting for AI and believe it's an important part of helping to solve global challenges. When respondents were asked about AI's importance in helping to solve issues in project management: time, quality and change / transformation are key. The acknowledgment of "change" as a must make companies to approach problems the same way as successful disrupters. Practically, judgment is clear and not affected by previous experience or inherent biases, and it hasn't yet learned what to try / not to try.

However, design and stakeholders reflect the human assistance needed by the AI to really fly, in the sense of conducting, direct and refine what the AI comes up with.



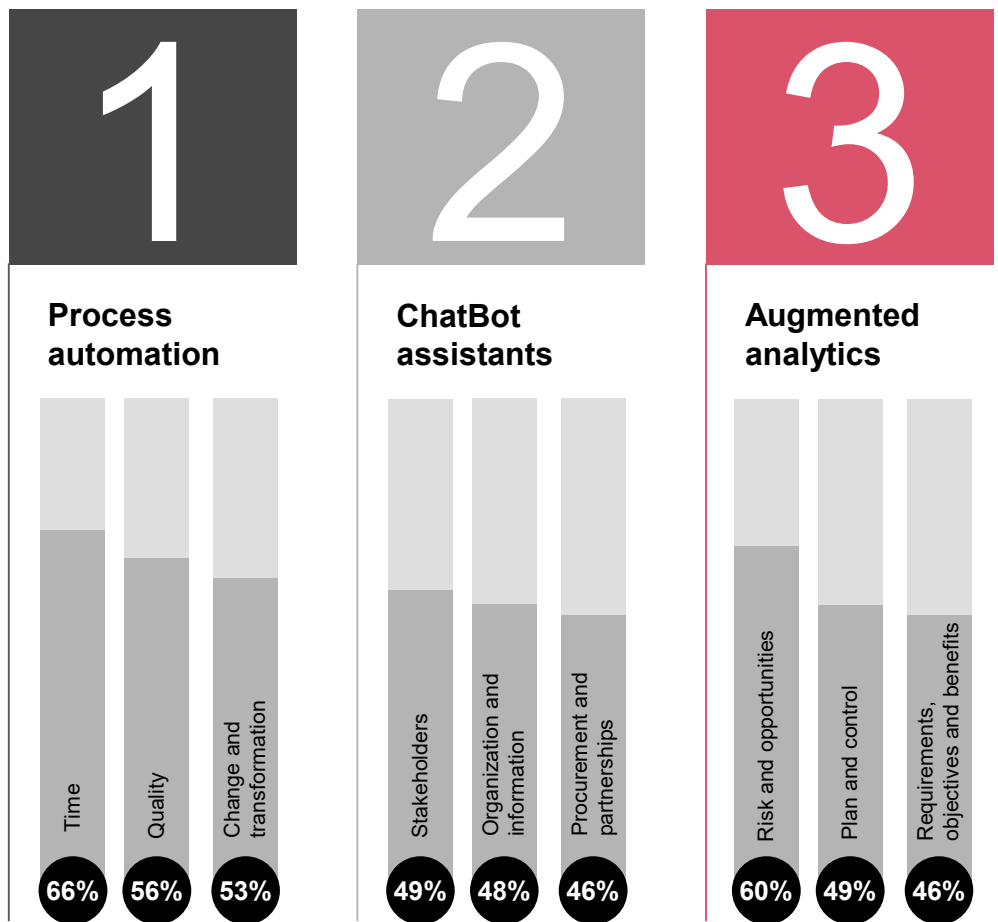
Project management practices that could benefit from the AI solutions



Perceived AI potential by type of PM processes

The majority of respondents (66%) are stating that they are currently considering Time as the main project management processes with the highest potential for AI process automation, with 66.03% of the total respondents being PM-related professionals, in comparison with 73.13% of the AL and E&F category and 58.97% of IT specialists.

Next processes which scored high with over 50% in terms of AI process automation potential are Quality (56%), followed by Change and Transformation (53%)



Other AI solutions mentioned by the survey participant as having high potential from project management practices were related to augmented analytics and drones i.e.: a photo from project site could be processed automatically, addressing several project management processes including Plan and Control and Quality.

The response showed a perceived potential for AI PM processes towards assisted and augmented AI with needed human interaction in the process as well as few cases with potential for full AI automated or autonomous solutions.



AI talent required for the AI adoption

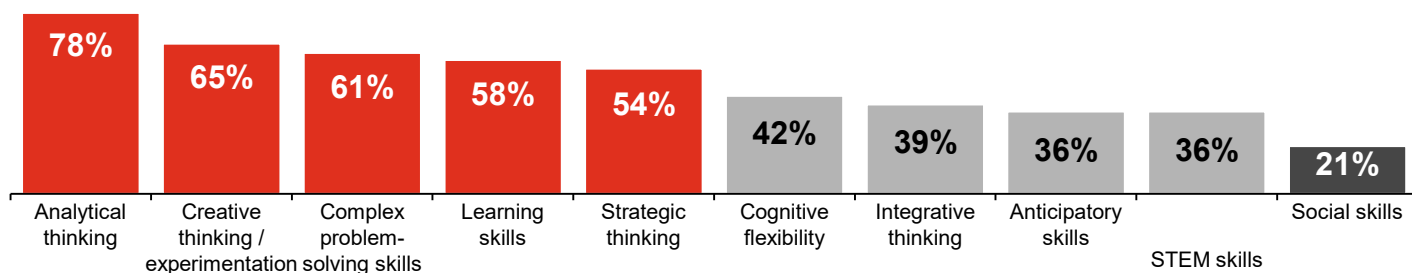
AI has also its barriers: talent gap is one of them. Barrier or challenge, talent is required in the digitalization road. Perhaps it is not surprising the fact that the that companies are competing for specialized skills when sourcing projects with the right people. Over 56% of respondents highlighted the experience in using basing functionalities of AI and basic digital skills as key requirements in the process of AI adoption for Project management activities. Digitization is core.

In the same time, IT skills are not sufficient. Complementary skills are a nice addition, including: analytical, creative and strategic thinking, alongside with skills in problem solving and learning skills. For the companies, it is mandatory either to build in-house AI capabilities, which requires internal talent with the right skills or to source talent from outside the company.

The minimum level of IT skills for using AI in project management



Non-IT skills required for using AI in project management



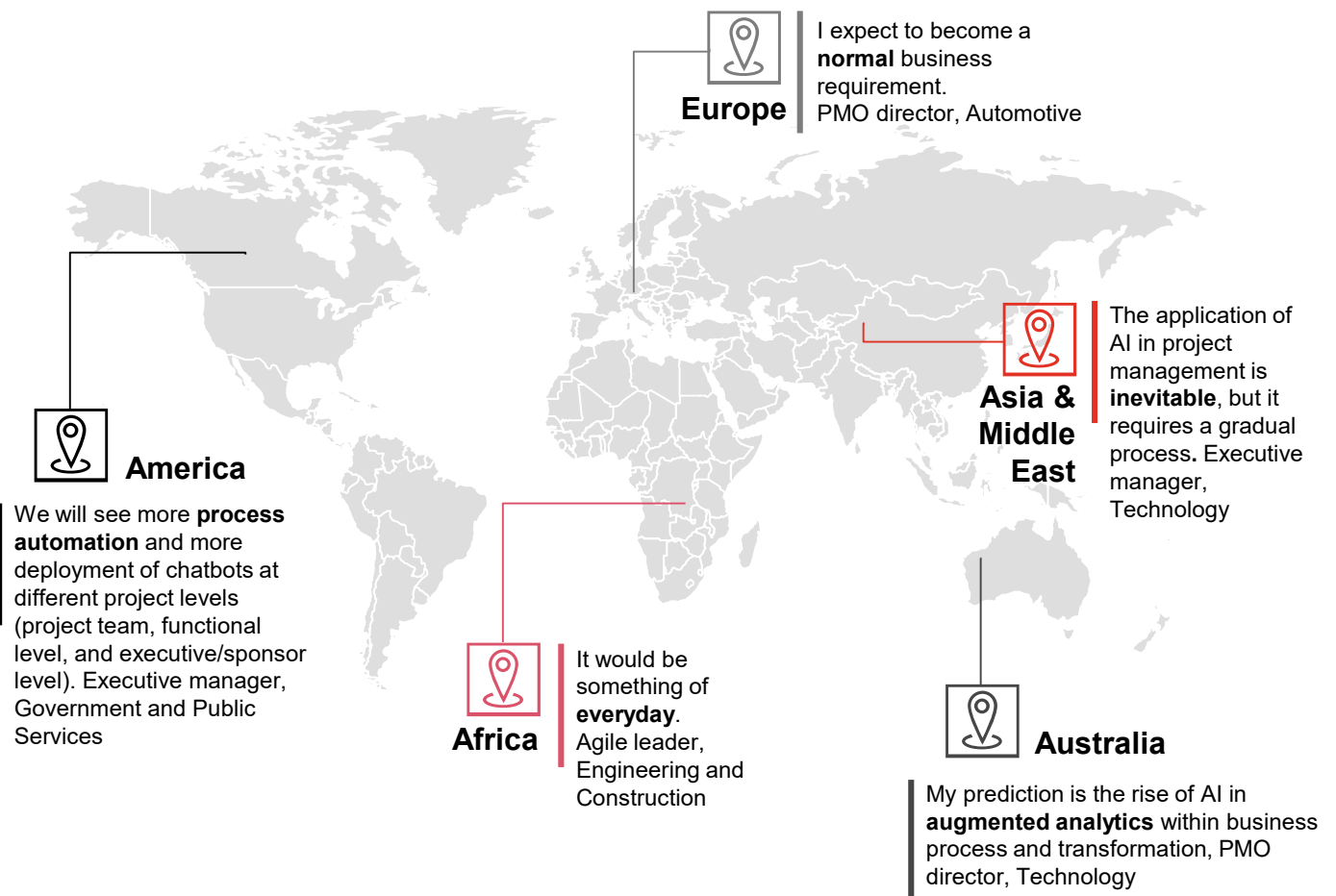
Top three best approaches in developing skills related to the AI usage in PM



Artificial intelligence adoption – micro-narratives from respondents



How do you think the adoption of AI technologies in project management will evolve in the next five years? (selection of survey responses)




- In five years, there will be an increased number of companies that will use AI technologies in project management in order to not fall behind the competition. I also think that new and more improved AI technologies will be available in the future. Functional manager, Financial and Business services – Europe
- Automation already exists, it's now moving to the next frontier of machine learning and better predictive analytics Programme manager, Industrial Manufacturing – Asia & Middle East
- Majority of routine operations will be performed by AI, and big data support for decision making. Executive manager, Technology – Europe
- I believe that in the next few years the rise of the AI will cause great changes in the way projects are managed. Project management professional, USA

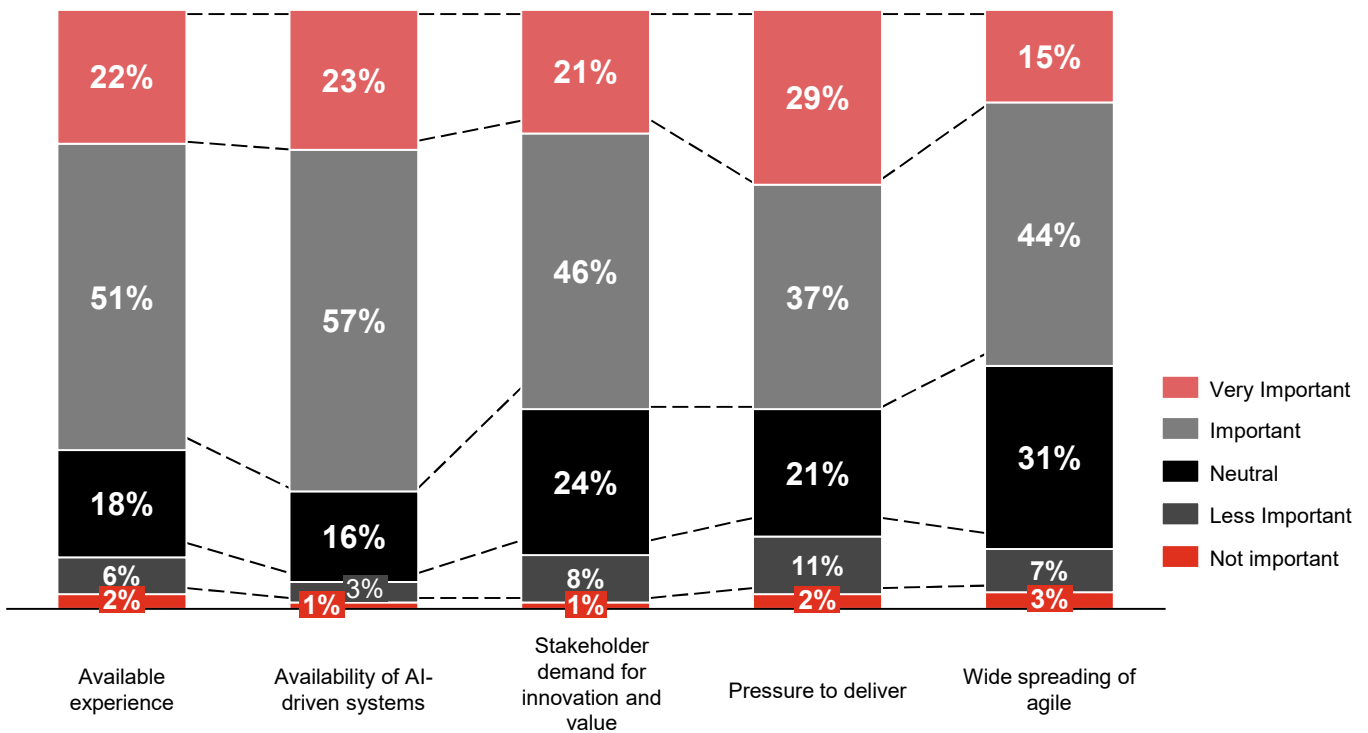
AI adoption drivers and barriers



AI adoption drivers

In terms of factors acting as drivers for adopting AI technologies in project management and their importance, the first three considered as important or very important are the availability of AI driven systems within the organization, the available experience and stakeholder’s demand for innovation and value, which are closely linked with the three main reasons for adopting the AI which are: increased productivity, decision making and overall performance within project management practice.

 The factors acting as drivers for adopting AI technologies in project management, based on their importance



Key figures

Available experience is considered as important and very important by 71.52% of PM-related professionals, 72.73% of AL and E&F category, 74.65% of IT specialists, 75.93% of the respondents working in organizations using AI and 68.42% of the respondents working in organizations not using AI.



AI adoption drivers

Availability of AI systems and services is considered as important and very important by 77.87% of PM-related professionals, 83.33% of AL and E&F category, 78.87% of IT specialists, 80.25% of the respondents working in organizations using AI and 78.20% of the respondents working in organizations not using AI.

High stakeholders' expectations for innovation and value is considered as important and very important by 62.03% of PM-related professionals, 68.18% of AL and E&F category, 71.83% of IT specialists, 67.90% of the respondents working in organizations using AI and 63.16% of the respondents working in organizations not using AI. The percentages of neutral responses are high (27.85% of PM-related professionals, 22.73% of AL and E&F category, 16.90% of IT specialists, 22.22% of the respondents working in organizations using AI and 26.32% of the respondents working in organizations not using AI).

Delivery pressure is considered as important and very important by 67.09% of PM-related professionals, 69.70% of AL and E&F category, 59.15% of IT specialists, 62.35% of the respondents working in organizations using AI and 69.92% of the respondents working in organizations not using AI. The percentages of neutral responses are high for the AL and E&F category (25.76%) and the respondents

“The adoption of AI technologies in project management will growth incrementally in next 3 years and from 2023 will witness an exponential growth.”

Agile leader, Europe

working in organizations using AI in comparisons with other categories of respondents (18.35% of PM-related professionals, 22.54% of IT specialists, 22.22% of the respondents working in organizations using AI and 16.54% of the respondents working in organizations not using AI).

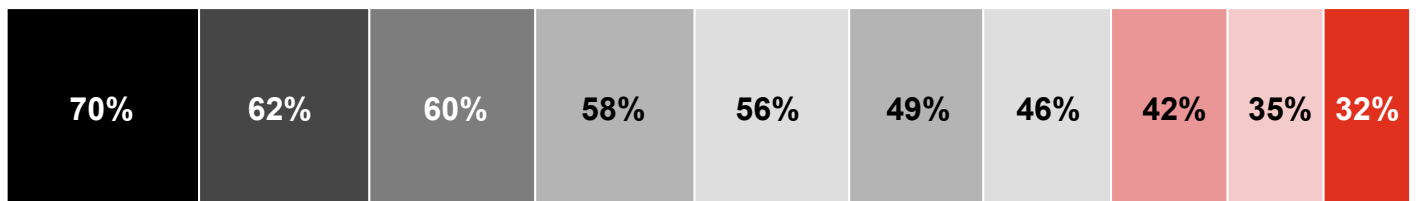
Wide spread of agile is considered as important and very important by 55.70% of PM-related professionals, 69.70% of AL and E&F category, 59.15% of IT specialists, 58.02% of the respondents working in organizations using AI and 59.40% of the respondents working in organizations not using AI. The percentages of neutral responses are higher in this case in comparison with other drivers (33.54% of PM-related professionals, 25.76% of AL and E&F category, 26.76% of IT specialists, 30.25% of the respondents working in organizations using AI and 30.08% of the respondents working in organizations not using AI).

Barriers to AI Adoption and overcoming solutions

There are barriers in AI adoption, at least in terms of perception. Over 70% of respondents indicated as a barrier, the limited understanding of AI technologies which could be overcome by an AI strategy which is aligned with the organizational business goals and is followed by investment in AI talent, trainings and a set of standards and methodologies which must be in place.



The top five most important barriers in using AI tools in PM today?



- Limited understanding of AI technologies
- Difficulties in deciding the best AI applications, due to limited experience (use cases)
- Data privacy, digital ethics and security risks
- Limited IT capabilities (IT technical skills, standard IT processes/procedures)
- Many AI solutions are not mature enough for the full deployment
- Limited financial resources
- Limited understanding of data, as an organizational asset and the need for data-driven business
- Rigid and risk-avoidance organizational culture
- No compatibility between existing IT infrastructure and that required by AI solutions
- Limited support from governance

Difficulties in deciding the best AI applications, due to limited experience (use cases) is the most frequent barrier indicated by 61.97% of IT specialists, the second most frequent one in the case of PM-related professionals (with 62.30%), after Limited understanding of AI technologies, mentioned by 70.89% and the third most frequent barrier in the case of AL and E&F category (with 60.61%), after limited understanding of AI technologies (with 78.79%) and Data privacy, digital ethics and security risks (with 68.18%).

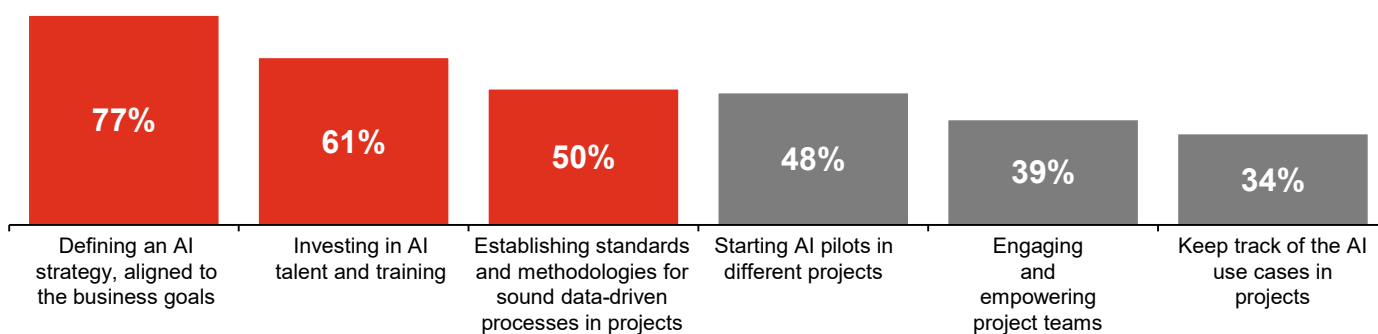
Data privacy, digital ethics and security risks is the second most frequent barrier indicated by the AL and E&F category (with 68.18%), the third most frequent barrier for PM-related professionals (with 60.13%) and on the 5-7 places in the case of IT specialists (with 53.52%).

Barriers to AI Adoption and overcoming solutions

Limited financial resources is on forth place in the list of barriers indicated by the IT specialists, with 59.15%, on the sixth place in the list of PM-related professionals' responses, with 48.10% and on the eighth place on the responses list of the AL and E&F category, with 39.39%.

There are no significant differences in the perception of the barriers between the respondents working in organizations using AI and those who are working in companies not using AI, with only one exception. 67.90% of the respondents working in organizations using AI indicated the **data privacy, digital ethics and security risks** (the second barrier after **limited understanding of AI technologies**, with 72.84% in comparison with the respondents working in organization that are not using AI with 51.13%, the sixth most frequent indicated barrier)

The three most important steps to overcome the barriers to AI adoption



The most frequently indicated action to overcome barriers in AI adoption is Defining an AI strategy, aligned to the business goals, in the case of all categories of respondents (74.68% of PM-related professionals, 78.79% of AL and E&F, 78.87% of IT specialists, 79.63% of the respondents working in organization using AI and 72.93% of the respondents working in organizations not using AI).

The second most frequently indicated action is Investing in AI talent and training in the case of IT specialists (73.24%), PM-related (62.66%), respondents working in organizations using AI (59.88%) and respondents working in organizations not using AI (63.16%). The second most frequently indicated action by the AL and E&F category is Starting AI pilots in different projects (57.58%).



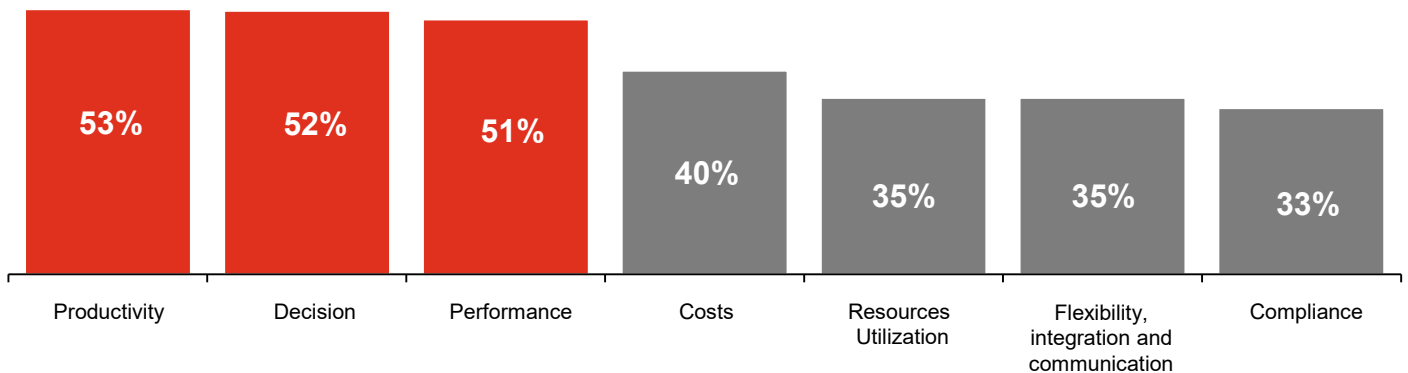
Perceived AI impact in project management

Expected benefits of AI adoption

In terms of expected benefits for adopting AI technologies in project these can be considered as the main reasons for adopting the AI increased productivity, decision making and overall performance within project management practice.



The first three reasons for adopting AI technologies in project management



The most frequent indicated benefit by the AL and E&F category of respondents (60.61%) was the Increased productivity, by the PM-related professionals (55.70%) was Project performance and reporting and by the IT specialists (56.34%) was Improvement of decision process .

While the improvement of project performance and reporting represents the most often indicated benefit by the PM-related professionals, this benefit is on the 2-3 places for the AL and E&F category (51.52%) and on only the fifth place for IT specialists (38.03%).

The respondents working in organizations using AI indicated more frequently the increase of productivity (53.70%) than those which are working in organizations not using AI (51.13%), after the improvement of the decision and improved performance and reporting (54.14%).

Improvements the project cost and time represents the sixth more frequent indicated benefit by the respondents working in organization using AI (36.42%), and the fourth most frequent indicated benefit by the respondents working in organizations not using AI (45.11%). 38.61% of the PM-related professionals, 40.91% of the AL and E&F category and 43.66% of the IT specialists indicated Improvements the project cost and time as a benefit of AI adoption.

Expected benefits of AI adoption

There are significant differences between the frequency of responses in regard with the resource utilization and compliance between the respondents working in organizations using AI (39.51% and 34.57%, with the positions 4 and 7) and those working in organizations not using artificial intelligence (29.32% and 30.83%, with the positions 7 and 5).



Behavioral aspects in PM, for which AI technologies could bring value



Team needs prediction followed by customised aids or coaching
(54%)



Team members profile in order to predict their actions
(37%)



Team members level of confidence
(34%)



Team members tendency towards compliance and ethic behavior
(27%)



Other
(6%)

Key figures

A relatively reduced number of IT specialists (25.35%) mentioned the Level of confidence as one of the behavioural aspect which can be addressed by the AI solutions, in comparison with PM-related professionals (32.28%) and AL and E&F (46.97%). A similar case is for the Tendency towards compliance and ethics, mentioned by only 19.72% of the IT specialists, 27.22% of PM-related professionals, 34.85% of AI and E&F, 33.95% of the respondents working in organization using AI and 19.55% of the respondents working in organizations not using AI.

Considering the Needs prediction followed by customized aid or coaching, this is the most frequent behavioural aspect which is mentioned by all categories of respondents (81.97% of IT specialists, 51.52% of AL and E&F and 51.27% of PM related, 55.64% of respondents working in organizations using AI and 51.85% of the respondent working in organizations not using AI).

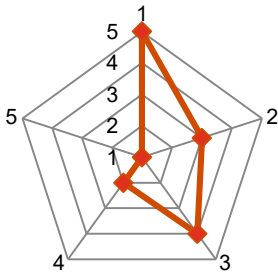
Impact on project success

Over 70% of the respondents nominated the compliance with quality standards as criteria for project success that could benefit from the AI adoption.



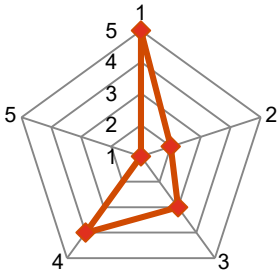
The top three criteria of project success, with the highest potential to be influenced by AI technologies

PM related professionals



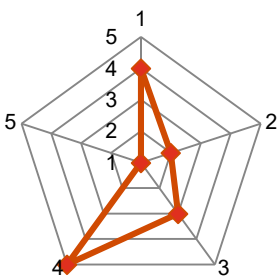
Achieving the quality standards is the most frequent project success criteria indicated as impacted by the AI adoption (68.35%) the PM-related professionals and AL and E&F and the second most frequent in the case of IT specialists (after Meeting the goals / business intent).

AL and E&F Managers



There are significant differences in the case of Meeting the goals/business intent. It is the project success criteria most frequently mentioned by the IT specialists, but the fourth most indicated success criteria by the PM-related professionals, after Achieving the quality standards, Completion the project in the budget and Completion the project on time.

IT specialists

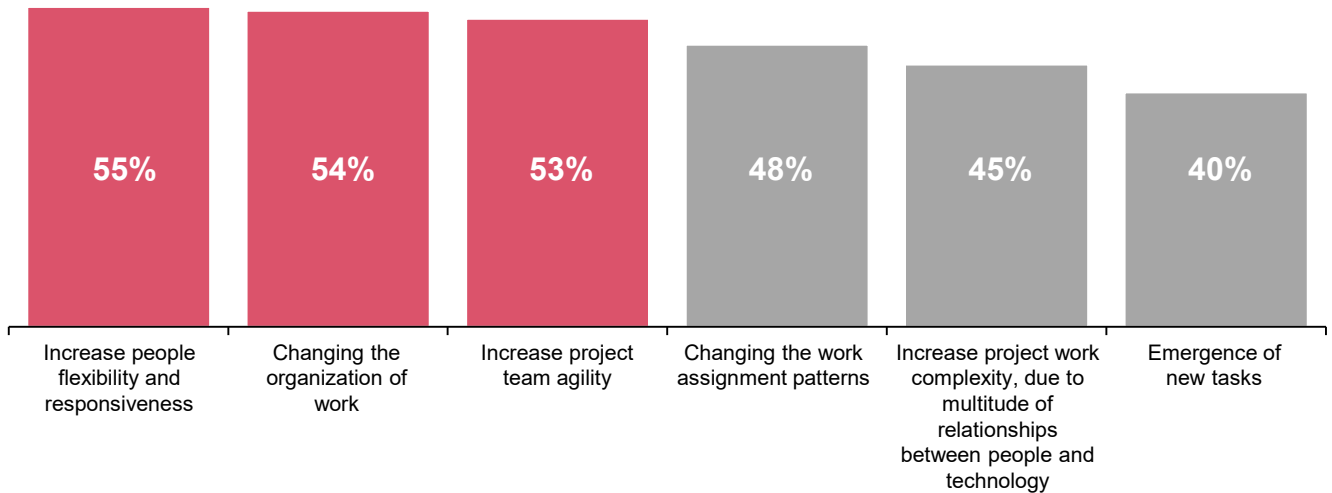


There are differences in the frequency of the project success criteria as indicated by the respondents working in organizations using AI in comparison with those working in organization not using AI. The criteria Achieving the quality standards is indicated by 72.84% of the respondents working in companies using AI, but only by 65.41% of those working in organizations not using AI. Completion on the budget is indicated by 53.09% and 64.66% respectively. In both cases, Stakeholders satisfaction is little mentioned (42.56%, and 36.84% respectively)

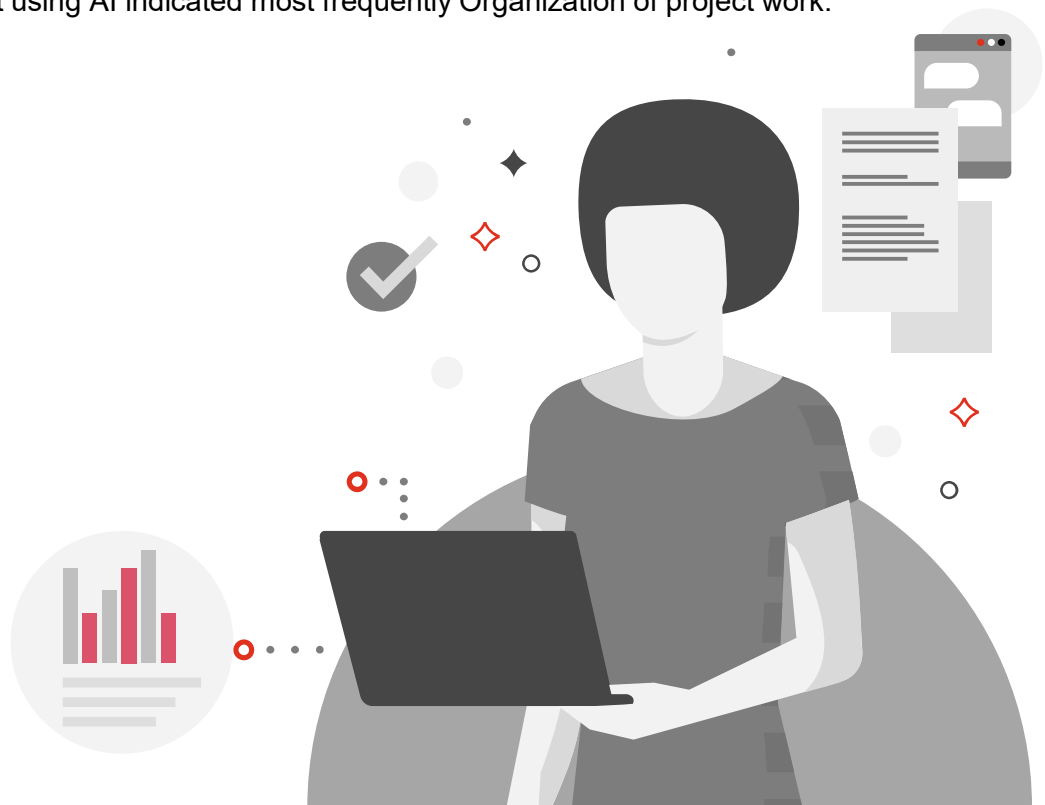
Impact on project success



The top three changes in the project work caused by the AI technologies



The change most frequently indicated by the PM-related professionals and the respondents working in organization using AI was People flexibility and Responsiveness (57.75% and 54.89%, respectively), while 56.06% of AL and E&F indicated New tasks/work in project, 57.75% of IT specialists indicated Project team agility and 54.89% of the respondents working in organizations not using AI indicated most frequently Organization of project work.

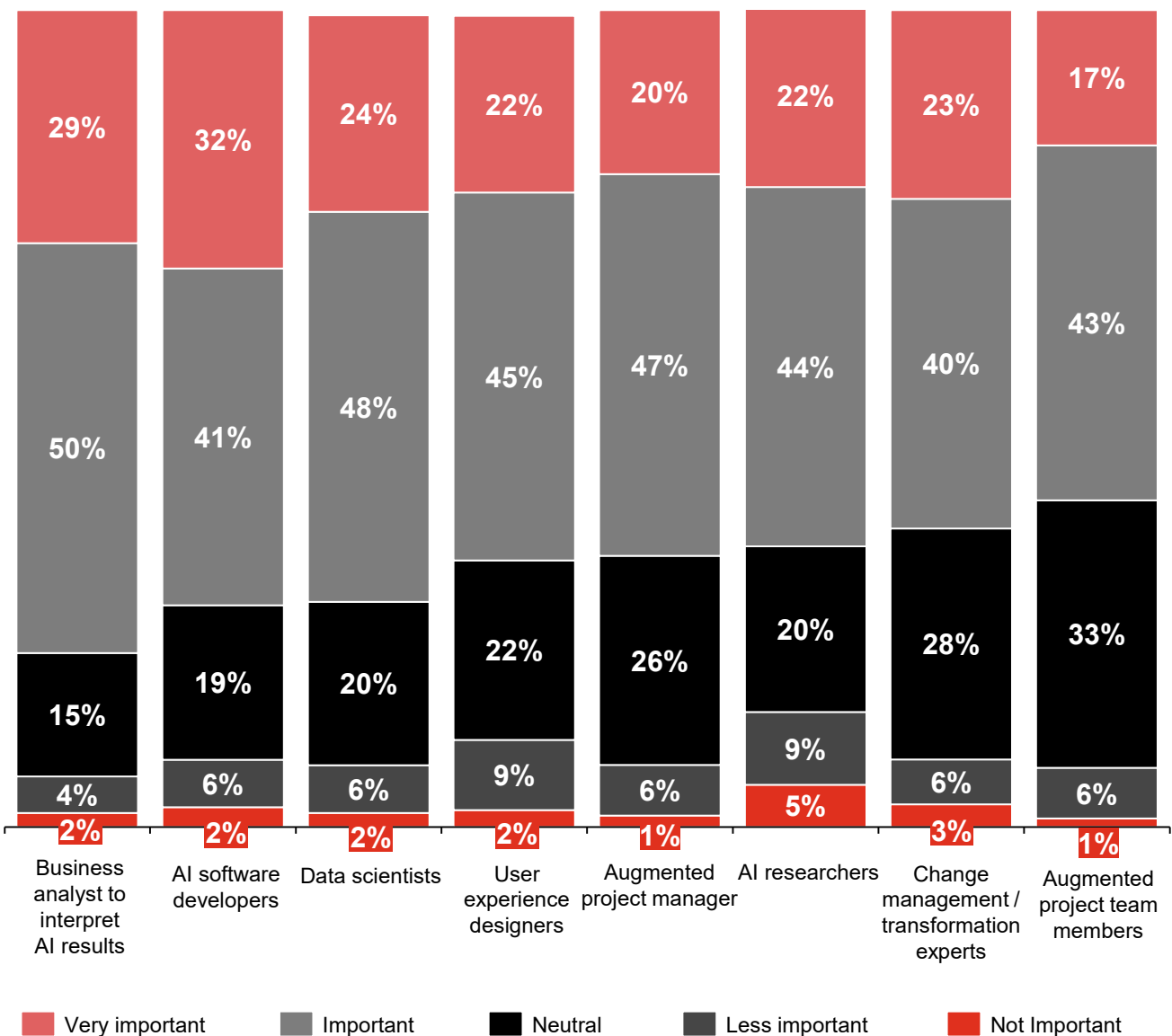


Impact on project work and project emerging roles

The most important role in a project team featuring AI technologies was selected by a 80% as being the business analyst which must be able to interpret AI results. In the same time the AI researches are seen by almost 15% as less or not important roles in the project team context. Augmented project manager received over 67%, ranking 5th in the project team.



Emerging role in a project team ranked by the importance

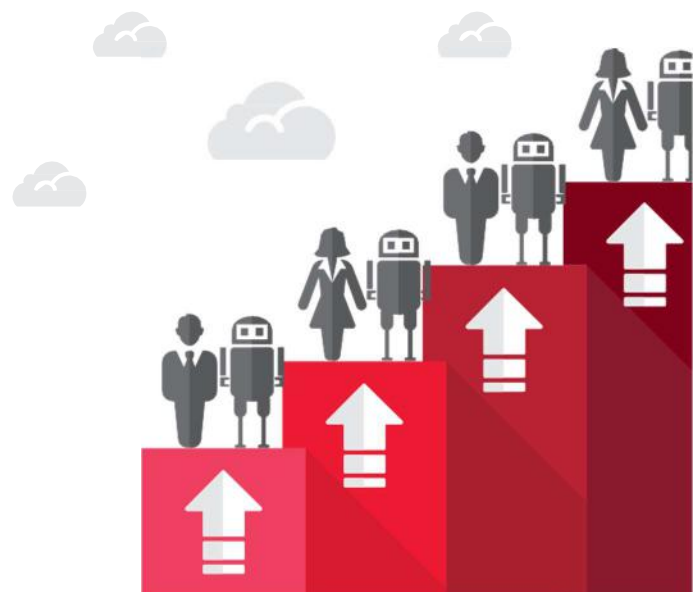


Impact on project work and project emerging roles

Considering the relatively high percentage of the response Neutral, it can be considered that the respondents were generally cautious in pointing out the importance of the emerging roles in the project teams. In average, 25.71% of the PM-related professionals, 19.72% of the IT specialists and 18.56% of the AI and E&F indicated a neutral importance of the emerging. In average, 28.10% of the respondents working in organization not using AI and 18.21% of those working in organizations using AI offered the same neutral answer.

Regarding the Augmented project manager role, 62.66% of the PM-related professionals considered it as being an important and very important role, in comparison with 74.24% of the AI and E&F category and 63.38% of IT specialists. 73.46% of the respondents working in organizations using AI considered the augmented project manager as being an important and very important role, in comparison with only 55.64% of those working in the organization not using AI.

All categories of respondents perceived business analyst as having a relevant contribution in the project teams after the AI adoption (83.33% of the respondents working in organizations using AI, 81.82% of AI and E&F, 80.28% of IT specialists, 74.68% of PM-related professionals and 70.68% of the respondents working in organization not using AI).



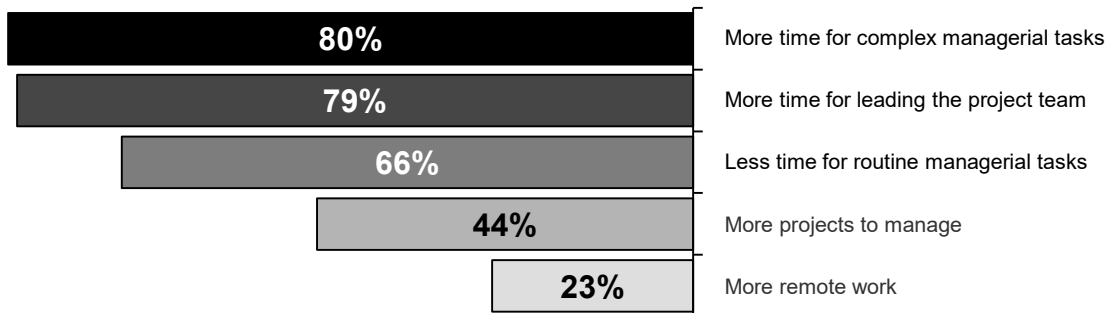
Impact on the project manager role

As companies continue to seek a competitive edge, increased AI adoption will be at the forefront. Analysing the respondents' answers, there is the obvious advantage that PMs can focus on complex tasks, AI solutions having as main benefit productivity.

Another key aspect signalled in the survey is the most probable role that AI tools will have in project management which is expected to be either that of an advisor according to 44% of the participants in the survey, or an assistant of the project manager with more than 52% of the responses.



Top three changes made by AI in the way the project managers spend their time



Key figures

The change most frequently indicated by different categories of respondents is More time for complex managerial tasks (85.92% of IT specialists, 80.38% of PM-related professionals, 83.33% of the respondents working in organization using AI and 80.45% of the respondent working in organization not using AI), with one exception: AL and E&F category of respondents, who most frequently indicated More time for leading the project team (83.33%).

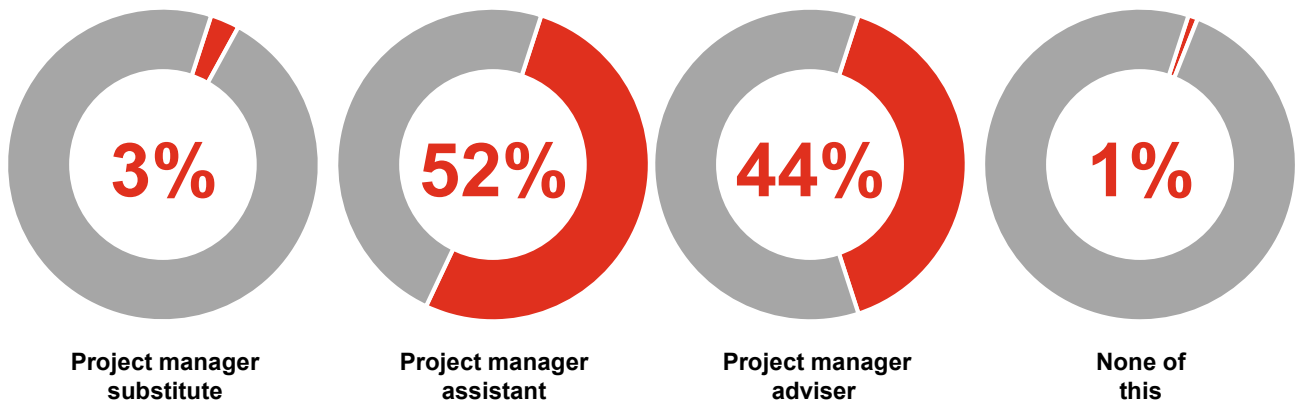
No category of respondent consider AI adoption as having a significant impact in virtualization of the project manager work (the percentages of those indicating More remote work varies from 25.32% of PM-related role to 21.13% of IT specialists).



Impact on the project manager role



Most probable role that AI tools could have in PM in the next five years



Key figures

There is a similarity between different categories of respondents in considering most frequently the AI tools as an assistant of project manager (53.80% of PM-related and 56.34% of IT specialists), followed by the adviser role (39.44% of IT specialists and 40.51% of the professional having a PM-related role). Only AL and E&F category considered AI solution most frequently as the project manager adviser (50.0%) than as assistant (48.48%).

58.02% of the respondents working in organization using AI and 44% of those working in organization not using AI indicated assistant as the role of AI tools, in comparison with 38.89% and 49.62%, respectively who selected the adviser role.



Emerging project management paradigms due to AI adoption



Projects as smart work spaces

When asked about the best approaches in developing skills related, all respondents pointed the training in both formal and on the job format as the first option in rising the level of AI skills in project management.



Opinions about the future evolution of projects, as “smart workspaces” in organizations (selection of survey responses)

- They will play a very central role in every company, AI won't replace workforce, it will make the new workspaces more efficient and more strategy-oriented. (Programme manager, Europe)
- Project components will become more and more standardized and componentized, and the project path will become easier to predict and control. (Executive manager, Asia and Middle East)
- This vision will happen in about five years (IT/IS professional for AI solutions, Europe)
- It is a very likely evolution (Executive manager, Europe)
- It is clear that most organizational work is become project-based work. Routine operations are a prime target for automation (PMO director, Australia)
- The evolution will happen very soon (Agile leader, Africa)

People or technology centric?

When asked about the best approaches in developing skills related, all respondents pointed the training in both formal and on the job format as the first option in rising the level of AI skills in project management.



Can AI-driven project management can be more “People centric” instead “Technology centric”? (selection of survey responses)

- Certainly Technology centric. Need human intervention to make it people centric. AI can suggest but end of the day it's people who need to decide which one will work which one will not. (Project Manager, Asia and Middle East)
- AI driven PM can be more people centric by making proactive recommendations. Almost like the Amazon shopping experience, where when you search for one thing, you will get recommendations on other areas that you may be interested in. (Executive manager, America)
- Change management procedures to include consideration of human factors (PM associate, USA)
- By a combination of people utilisation and user interface (Agile leader, Europe)

Conclusions

As a general view, employees want to know what AI means for their job and future prospects, while businesses are asking how they can capitalise on the opportunities that AI presents and where investment should be targeted. Going through all these considerations, important is how to build AI in a responsible and transparent way needed to maintain the confidence of customers, skilled professionals and wider stakeholders. Consequently, investment in AI is a leap of faith in future.

Looking ahead, the survey results suggest that digitization and certain foundational practices are critical to creating value from AI and enabling progress. The implications related to adoption of AI are significant. In many companies, they involve transformation-level changes to core business processes and creating new ways in which people, with different capabilities, will work together with the machines.

Considering that the executive is perceived by most of the respondents as the right level of decisions related to the AI adoption, the frameworks and models to be applied are mainly those addressing the organizational behavior, such as: TOE framework, absorptive capacity models and dynamic capabilities models. It is different from other ICTS, to which the models of users' behavior are usually preferred. The models of organizational behavior appear to be adequate to cover the main drivers and barriers of AI adoption, which allows us to consider that there is no need to develop new frameworks and models for the adoption of disruptive technologies in the project management domain.

The report intends to create a clearer picture of the full potential of AI globally, extending the exploration of AI's potential inside the borders of Project Management, as an augmenting factor for the workforce and productivity.

References

PwC (2020), Navigating the rising tide of uncertainty – 23rd Annual Global CEO Survey
<https://www.pwc.com/gx/en/ceosurvey/2020/reports/pwc-23rd-global-ceo-survey.pdf>

IPMA (2018), Using Artificial Intelligence in PM: Just a good bedtime story? Available here:
<https://www.ipma.world/using-artificial-intelligence-pm-just-good-bedtime-story/>

PwC (2018), Will robots really steal our jobs? An international analysis of the potential long term impact of automation. Available here:
<https://www.pwc.co.uk/economic-services/assets/international-impact-of-automation-feb-2018.pdf>

PwC (2017), Sizing the prize. What's the real value of AI for your business and how can you capitalise? Available here: <https://www.pwc.com/gx/en/issues/data-and-analytics/publications/artificial-intelligence-study.html>

Edquist, C., & Riddell, W.C. (2000). The role of knowledge and innovation for economic growth and employment in the information and communication technology (ICT) era, in: Rubenson, K., and Schuetze, H. G. (Eds.) Transition to the knowledge society: Policies and strategies for individual participation and learning. Vancouver, Canada.



Authors



Constanța Bodea
Vice President Research, IPMA
constanta.bodea@ipma.world



Ding Ronggui
IPMA Research Coordinator
ding_rgui@email.sdu.edu.cn



Oana Stanciu
Senior Manager FS, PwC
oana.stanciu@pwc.com



Cosmin Mitea
Senior Consultant MCS, PwC
cosmin.mitea@pwc.com

Acknowledgments

The contributions of the following organizations in the development and financial support of this research is noted with thanks:

International Project Management Association (IPMA), PricewaterhouseCoopers Romania (PwC) and Project Management Romania Association (PMR).

We would like to thank those who completed the survey, the professionals and regional experts who took part in the study, whose invaluable input helped to shape this report. In the interest of confidentiality, all quotes included in the report have been anonymised.



Thank you!



This publication has been prepared for general guidance on matters of interest only, and does not constitute professional advice. You should not act upon the information contained in this publication without obtaining specific professional advice. No representation or warranty (express or implied) is given as to the accuracy or completeness of the information contained in this publication, and, to the extent permitted by law, PricewaterhouseCoopers LLP, its members, employees and agents do not accept or assume any liability, responsibility or duty of care for any consequences of you or anyone else acting, or refraining to act, in reliance on the information contained in this publication or for any decision based on it.