



Delft University of Technology

Navigating project management talent in the data-rich era

Papadonikolaki, E.; Liu, Y.; Maritshane, Kirk; Chan, P.W.C.

Publication date

2023

Document Version

Final published version

Citation (APA)

Papadonikolaki, E., Liu, Y., Maritshane, K., & Chan, P. W. C. (2023). *Navigating project management talent in the data-rich era*. Paper presented at 2023 Annual Conference of European Academy of Management (EURAM), Dublin, Ireland.

Important note

To cite this publication, please use the final published version (if applicable). Please check the document version above.

Copyright

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy

Please contact us and provide details if you believe this document breaches copyrights. We will remove access to the work immediately and investigate your claim.

Navigating project management talent in the data-rich era

Abstract (400 words)

The digital transformation in project management is causing disruption on how the organizations recognize and value the skills and expertise of the new data-savvy talents in organization's decision-making processes for improved project delivery. Existing research on digital transformation in projects has mainly focused on what technologies can help organizations and people achieve, without connecting to the disruptions that technologies bring to projects human and social capital. To address this deficiency and harness the data-rich era, there is a need to go beyond the prevailing technical line of thought and think about people's issues in project settings. Therefore, this research aims to examine talent management initiatives for project management professionals on how they can exploit the inherent advantages of the data-rich era and digital transformation to build an inclusive workplace. The study poses two research objectives, first to understand how project management professionals experience the trends of the data-rich era in the project environment and data-savvy talent (also in light of the changing demographics in the sector) and second to identify the opportunities and obstacles for managing project management talent to deliver projects in the data-rich era. To answer these questions, this paper uses semi-structured interviews from a purposive sample of 24 interviewees with diverse project management experience. The interviewees were recruited from three main categories of stakeholders: industry, academia, and professional institutions. The research through qualitative data analysis and abductive thinking first identifies an overemphasis on developing data-savvy talent in the expense of attracting or retaining it. Second, the study documents the existence of six clusters of opportunities and obstacles in delivering of projects through data savvy project management talent. Accordingly, the identified themes/clusters of connectivity, communication, information management, project delivery, disruption, and project work and wellbeing provide new directions for talent management practices such as attracting, developing and retaining data-savvy talent in the data-rich era.

Keywords: 3-6 max

Digitalization, digital technologies, talent management, project management, project professionals

1 Introduction

Project work is everywhere. From traditional capital projects to knowledge work in Information and Communication Technology (ICT), financial services, and R&D (Research and Development), to increasingly frequent organizational change in all sectors. The 'projectification' of society means that project work is now the fundamental unit and driver of economic action (Schoper et al., 2018, Jensen et al., 2016). This rapid increase in projectification is also accompanied by a simultaneous increase in digitalisation and datafication. Data has been considered the new oil in the 21st century. More recently, it has been said 'data is the new soil', indicating a fertile medium of data that can produce rich insights, wise decision-making and intelligent actions. Due to accelerated development of digital technologies and data science, digital innovation has been gaining traction. Massive quantities of data are now available and the capacity to capture, store, process, share and visualize data is advancing. This carries implications not only for organisations but also for projects in finding new ways to cope with dynamic environments, control performance and enhance their capabilities (Papadonikolaki et al., 2022). We also see a promising pipeline of new talent entering into the management of both ongoing and future projects. The 'digital natives' can play a unique role in the rapid acceleration of the digital transformation of project work. To this end, this study explores how the data-rich era and in particular the potential pipeline of new data-savvy talent entering the market are influencing the project management profession.

Digitalisation and datafication are significantly affecting Project Management (PM), particularly in the delivery of projects. While digitalization relates to a sophisticated and business-relevant form of digitization transferring information from analogue to binary (Ross, 2017), datafication seeks to transform social life such as subjects, objects and practices, into quantified data by applying mathematical analysis (Mayer-Schönberger & Cukier, 2013).

Recent project studies discuss how major projects are increasingly affected by growing complexity and uncertainty, and how project organizing can be addressed through digitalization of project information management (Whyte et al., 2016) According to Wijayasekera et al. (2022), cloud computing, automation, Artificial Intelligence (AI), information modelling and data analytics bring enormous potential in megaprojects but to leverage complexity management, PM needs to turn towards an information economics approach. Digitally-enabled project delivery models specify a need for integrated digital solutions, integrated relationships across the supply and demand side and a growing importance of digital workflows and analytics over traditional document-based workflows (Whyte et al. 2019). Marnewick and Marnewick (2022) attest that digitalisation is not only changing how projects are managed but it is also changing the nature of PM and they call for distinguishing digitalisation of PM as a distinct school of thought in its own right. Departing from the above ideas around digitalisation in PM, this study focuses on an under-research aspect of project organising with digital technologies: people development and particularly the management of new talent.

At the same time, apart from digitalisation, PM practices are being profoundly changed due to a combination of demographics (the educational expansion creates a pool of high-skilled employees entering the market) (Stier and Herzberg-Druker, 2017) and technical (the rise of digital innovations) (Nambisan et al., 2017) causes. The changes lead to new jobs and roles, new professional accountability, and greater integration and collaboration across professional functions and teams (Papadonikolaki et al., 2019). The widening digital divide calls into question how we attract, develop, and retain project management professionals. Project management professionals need to become more sensitive in virtual interactions and better understand each other's behaviour and thinking patterns. New talents bring experience and familiarity with digital technology and have a better understanding of emerging business

models. Nurturing a diverse and skilled workforce is a key element of the project management profession's long-term agenda for change. Thus, this raises the following research questions (RQ):

1. RQ1: How do project management professionals understand and experience the trends of the data-rich era in the project environment and the data-savvy talent?
2. RQ2: What are the opportunities and obstacles for managing project management talent to deliver projects in the data-rich era?

We focus on both the demographic changes and technological changes, particularly the relevance of the fields of human resource management (HRM) and project management; and the potential to develop new empirical insights, theoretical development and research directions.

The rest of the paper is organised as follows. The ensuing section presents the theoretical background of the work and relevant hypotheses. In the third and fourth section, the methodology and the data are presented respectively. The paper concludes with a discussion of the findings section, including theoretical contributions, practical implications, future research directions, and the conclusion with final summarizing and concluding remarks.

2 Theoretical background

2.1 Human resources management in projects

HRM is the process of managing an organization's workforce in order to achieve its goals and objectives. This involves recruiting and selecting employees, providing training and development opportunities, managing employee performance and compensating and rewarding employees. HRM also involves ensuring that employees are treated fairly and in accordance with relevant laws and regulations. The ultimate goal of HRM is to support the organization's overall business strategy and help it to achieve its objectives.

The literature on HRM in project management indicates that effective management of project team members is crucial for the success of a project. This involves properly defining roles and responsibilities, setting clear goals and expectations, providing adequate resources and support, and regularly communicating and engaging with team members. Effective HRM also involves assessing and addressing conflicts and issues within the team, as well as managing performance and providing feedback and recognition. Another key function of HRM is talent management. Talent management is defined as a collection of HRM practices and processes, including attracting, developing and retaining people with the required skills and aptitude to meet current and future organizational needs (Lewis and Heckman, 2006).

Havermans et al. (2019) and Alkhudary and Gardiner (2021) highlight that project contexts and the project management profession do not lend themselves to having a clear career pathway. Project managers often fall into the role by accident, and they generally do not progress to executive management positions for a variety of reasons: for example, good project managers are hard to find and so organisations tend to keep good project managers within the project management function rather promote them up the organisational hierarchy; in any case, project managers typically enjoy the excitement of running projects and do not want to move up the corporate hierarchy themselves. Project managers are also often seen as generalists, which may hamper their career progression in contexts where technical expertise is privileged. Given that digital work is often seen as being more ‘technical’, there is thus scope to examine how this can impact on the management of talent in a more generalist field such as project management.

2.2 Impact of digitalisation and datafication on projects

Digital technologies are making it easier for project managers to plan, execute, and monitor projects, and are helping to improve the efficiency and effectiveness of project management. For example, project management software can help streamline project planning and

execution, while collaboration and communication tools can facilitate better teamwork and coordination among team members. Additionally, data analytics and reporting tools can provide valuable insights and data for decision-making and continuous improvement. Key digital technologies used in construction projects include Geographic Information Systems (GIS) and asset databases (Whyte et al., 2016) as well as digital artefacts (Whyte, 2019) such as Building Information Modelling (BIM).

General-Purpose digital technologies impacting project management are rapidly accelerating (Steen et al., 2022) and include:

- Project management software: These are digital tools that help project managers plan, organize, and manage projects more efficiently. Examples include Asana, Trello, and Basecamp.
- Collaboration and communication tools: These are digital platforms that facilitate communication and collaboration among team members, clients, and stakeholders. Examples include Slack, Microsoft Teams, and Zoom, as well as Virtual Reality (VR)/Augmented Reality devices.
- Data analytics and reporting tools: These are digital tools that help project managers track and analyze project performance data, such as project progress, cost, and timeline. Examples include Tableau, Power BI, and Google Analytics.
- Artificial intelligence and machine learning: These are digital technologies that enable project managers to automate certain tasks and processes, such as project scheduling and resource allocation Wijayasekera et al. (2022). Examples include AI-powered project management platforms, such as Microsoft Project and PlanGrid.

2.3 Importance of digital talent management in project management

Although talent management is of strategic importance in HRM, it is usually seen as more task-oriented and operational. Bredin and Söderlund (2011) introduced the quadriad as a framework to examine the different roles and interactions between HR specialists, line managers, project managers and project workers. They strategically sampled large engineering firms in Sweden that have a significant project management function and distinguished between intra-functional and inter-functional contexts. Bredin and Söderlund (2011) positioned against (at that time) growing emphasis on strategic HRM to highlight how line managers and project managers (particularly in inter-functional contexts) are taking on more HRM responsibilities at the operational level. This operational focus is perhaps driving more task-oriented ways of managing talent, rather than to take a more strategic view.

Digital talent management refers to talent management to address the gaps created into organisations due to digital transformation and increasingly it should be addressed as a strategic and not an operational need. Digitalisation is impacting talent management in numerous ways. At a first level, a lot of research has taken place on identifying how digitalisation impacts the process of recruiting new talent. For example, Donald, et al. (Forthcoming) interviewed 36 careers advisors and graduate recruiters and noted that digital maturity was seen in terms of positive employer branding, which can aid in attracting new (early-career) talent. That said, virtual recruitment can also lead to the risk of social exclusion and the lack of diversity (e.g. the digital poor). However, this approach emphasises predominantly on the impact of digitalisation on recruiters and not of the talent, that is the focus of the present study.

Digital transformation has a significant influence on talent management; in their study, Guerra et al. (2023) distinguished between attracting talent and retaining talent, and considered development and deployment of talent as connected to both attracting and

retaining talent. Their structural equation model and survey of 314 Spanish companies (including construction companies) found that more emphasis has been placed on retaining talent than on attracting talent.

2.4 Impact of digital talent management on project teams

Guinan et al. (2019) conducted a multi-level study of 60 companies, including fieldwork across 5 company sites and 130 interviews with senior IT professionals to understand how a digital project team can be created. Talent management is one of four critical levers found to aid in developing innovative project teams – talent management focussed mainly on scaling up digital competencies through e.g. the creation of hubs, reverse mentoring and the promotion of digital leadership; it was also interesting to note that they found that instead of focussing on technical skills, there is a need to pay more attention to other abilities e.g. the ability to be open-minded and to continuously learn and develop Guinan et al. (2019). The other three levers include creating a diverse and targeted team composition (including ninja teams that can provide fluid cross-functional support and T-shaped individuals), promoting agile ways of working that puts an emphasis on iterative goal setting, self-managed teams and servant leadership, and promotion of continuous learning.

Using Q-methodology to a sample of project managers' experiences on digitalisation in South Africa, Marnewick and Marnewick (2021) found that the respondents placed more emphasis social competences (communication and collaboration), rather than the more technical aspects of digital intelligence such as cybersecurity. This shows a recognition of the impact of digitalisation on the human and social capital of projects beyond the task-oriented considerations.

Gillberg and Wikström (2021) build on literature on inclusion/exclusion and focus on a case study of a manufacturing company to highlight the experiences of older people (particularly

those above 40 years of age). By distinguishing between attributive positioning and self-positioning, and differentiating between positions of acceptance and rejection, Gillberg and Wikström highlighted various possibilities in which digital transformation can either include or exclude older workers – e.g. by assuming (self or attributed) that older workers are less capable in dealing with digital work and thus deploying them to product lines that are due to discontinue. At the same time, there is recognition that older workers have valuable (other) skills to offer. Unlike Gillberg and Wikström (2021) who focussed mainly on the experiences of older workers identified as digital immigrants, our present study considers the experiences of and interactions between both digital natives and digital immigrants.

2.5 Research gap

The emphasis on digital transformation has so far been on what technologies can do for us, often neglecting how such transformation can radically change what people and organizations do (Robinson et al., 2016). To address this deficiency and harness the full potential of the data-rich era, there is a need to go beyond the prevailing technical line of thought to think about people's issues. For example, although digital technologies, such as BIM, radically alter collaborative work, they are considered more as tools affecting the structure of work and less as socio-technical systems affecting both structure and agents (Papadonikolaki et al., 2019). This research, therefore, aims to examine the talent management initiatives to investigate how new (digital natives) and senior (digital migrants) project management professionals can build an inclusive workplace to exploit the inherent advantages of the data-rich era.

It is also important for organisations to recognise and value the skills and expertise of the new data-savvy employees, and to integrate their knowledge and insights into the organization's decision-making processes. This can help to foster a culture of innovation and collaboration, and can ultimately lead to improved project and business outcomes.

3 Methodology

3.1 Rationale and research stages

The scope of this study is around the PM professions in the construction, Information Technology (IT) sectors and beyond. The study draws upon empirical fieldwork conducted between June and November 2022. The study followed a mixed methodology of questionnaire survey and semi-structured interviews to benefit from diverse data and perspectives. In this paper, due to brevity of communication, only the qualitative part of the data collection and analysis will be presented.

3.2 Data collection methods

The analysis of how the data-rich environment is transforming the talent pipeline was deepened through a qualitative research phase by engaging expert interviewees in semi-structured interviews. The semi-structured questions centred around the following topics: (a) educational and professional background of the interviewee, (b) experiences and perspectives of digitalisation and the project management profession, (c) organisational perspectives of digitalisation and project management, (d) digital talent management and (e) external support for the digital transformation of the project management profession. In this stage, a purposive sample of 24 diverse participants were interviewed. They were recruited by the researchers' professional networks and they came from three main categories of stakeholders: industry, academia and professional institutions, such as the Project management Institute (PMI), Association for Project Management (APM) and International Project Management Association (IPMA).

Saturation is important for qualitative studies that use purposive sampling and it is ensured when no new information is being collected to add further to the analysis (Bazeley, 2020). Although saturation can be reached according to different scholars between nine and 16

interviews (Bazeley, 2020, Hennink et al., 2017), in our sample, because we wanted to have a balanced sample from industry, academia and professional institutions, we exceeded these thresholds. The profiles of the interviewees are shown in Table 1 below. The interviewees are a balanced mix of novices and experienced people in the project field from a variety of countries and company types. Most of the interviewees were interviewed online and their interview was recorded and transcribed. The data collection followed the ethics guidelines of the institution of the first author, including the sharing of the participant information sheet, interview protocol and semi-structured questions and consent form that was completed and signed.

Table 1: Interviewee profiles.

Int No.	Country	Current role	Company	Years in industry	Interview duration	Interview type	Recording
1	UK	Project Manager	Design & Engineering consultancy	5	31 min 35 Sec	Online meeting	yes
2	Netherlands	Digital Transformation Coordinator	Contractor	5	36min 01 Sec	Online meeting	yes
3	Croatia	Vice Dean & Professor	Academia	20	43min 49 Sec	Online meeting	yes
4	UK	Project Manager	Contractor & Consultancy	6	41min 36 Sec	Online meeting	yes
5	UK	Risk Manager & Data analyst	Contractor & Consultancy	6	57min 48 sec	Online meeting	yes
6	Netherlands	Project Manager	Engineering consultancy	7	37min 08 Sec	Online meeting	yes
7	UK	Head of projects (Project Manager)	Design, Engineering & PM consultancy	20	56min 03 Sec	Online meeting	yes
8	UK	Specialist Project Manager (data analytics)	Design & Engineering consultancy	20	38mins 30 Sec	Online meeting	yes
9	UK	Professional Researcher	Design & Engineering consultancy	8	48mins 49Sec	Online meeting	yes
10	Netherlands	Information Manager	Engineering consultancy	14	29mins 03 Sec	Online meeting	yes

11	UK	Associate Director	PM consultancy	13	57 mins 24 Sec	Online meeting	yes
12	Croatia	Civil Engineer	Railway company	>10	N/A	Email	no
13	UK	Technical Director Railways	Engineering consultancy	42	40mins 58sec	Online meeting	yes
14	UK	Service Director	Engineering consultancy	17	32mins 09 Sec	Online meeting	yes
15	Netherlands	PhD Candidate	Academia	1	2hrs 17mins	Online meeting	no
16	Netherlands	Associate Professor	Academia	2	1hr 21mins	Online meeting	no
17	Netherlands	Associate Professor	Academia	4.5	2hrs 20mins	Online meeting	no
18	Netherlands	Assistant Professor	Academia	2	47mins 00 Sec	Online meeting	no
20	Global	Vice-President	Professional Institution	20	32mins 34Sec	Online meeting	yes
21	UK	Project Delivery Director)	Professional Institution	>20	38mins 04Sec	Online meeting	yes
22	UK	Project Manager	Professional Institution	45	45min	Online meeting	yes
23	Netherlands	Consultant on Information Management	Design & Engineering consultancy	1	40mins 09Sec	Online meeting	yes
24	Netherlands	BIM Modeller	Contractor	4	38mins 37secs	Online meeting	yes

3.3 Data analysis methods

The data was analysed through qualitative data analysis and a combination of deductive and inductive coding (Saldanā, 2009). The purpose is to highlight examples of (future) project management professionals, their changing work (and workplace) and the impacts on project-based businesses and organizations. The hybrid type of coding featuring both deductive (theory-driven) and inductive (data-driven) codes provided rigor to the study and approached the phenomenon in a holistic manner (Fereday and Muir-Cochrane, 2006). This mixed approach is also referred to as blended approach by (Graebner et al., 2012) or abduction by (Alvesson and Kärreman, 2007).

The data was analysed in two main cycles of coding by different researchers. In the first cycle of coding, one of the researchers, coded the data deductively following the codes of attracting talents, developing talents, retaining talents, opportunities, and obstacles. Afterwards, the data was coded in an inductive way from another researcher by reading again all the transcripts for two purposes: first to validate and enrich the first circle of coding and second, to identify new patterns and overarching themes in the data to answer RQ1 and RQ2. The second cycle of coding helped to create higher level categories from the first coding cycle (Gioia et al., 2013) and acted as an anchor of support for the findings. The qualitative data from the interviews were coded and analysed in the web version of Atlas.ti that allowed for collaboration among the whole team of researchers.

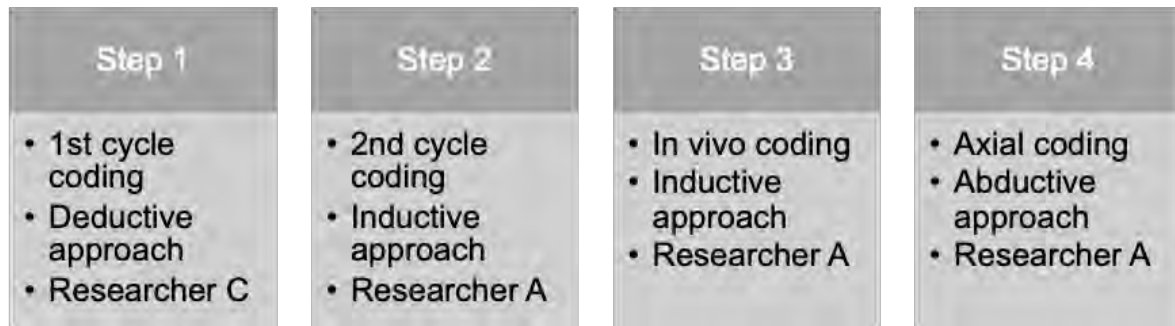
4 Data and findings

4.1 Qualitative data analysis (QDA)

The analysis of the qualitative data from the 24 interviews focused on inductive coding around the opportunities and obstacles for managing project management talent to deliver projects in the data-rich era. The transcripts were coded in two steps. First one researcher coded all the interviews using the deductive codes of ‘attracting talents’, ‘developing talents’, ‘retaining talents’, ‘opportunity’ and ‘obstacle’. Secondly, another researcher coded the same data and added new quotations to them as needed. This second step of coding from an additional coder validated the initial coding. Third, the same researcher added inductive codes by allocating specific thematic codes on the opportunities and obstacles based on the interviewees’ spoken words (in vivo coding). Fourth, these thematic codes were grouped into new clusters/themes that were presented in both the opportunities and obstacles categories (axial coding). During the coding, it was made apparent that a specific aspect of managing data-savvy project talent could work as both an opportunity and an obstacle. Having the same

overarching clusters or themes aided with furthering the analysis and comparison of the opportunities and obstacles. Figure 1 illustrates the coding process explained above.

Figure 1: Steps of the coding process.



The next section presents that data on ‘attracting talents’, ‘developing talents’, ‘retaining talents’. In total there were 30 quotations on attracting, 41 on developing and 20 quotations on retaining the data-savvy talent. In the following two sub-sections on opportunities and obstacles respectively, the data is presented based on the axial coding (themes) as main categories and the evidence is presented as in vivo coding supported with statements from the interviewees clustered and summarised. The quotations are not presented verbatim so as to present the direct quotes in a future published version of the paper and avoid copyright issues. The quotations are evidenced by using the numerical identifier of the various interviewees shown in Table 1, e.g. Int-n, where n is the number of interviewee. In total there were 53 quotations on opportunities and 94 quotations on obstacles.

4.2 Attracting, developing and retaining data-savvy talent

Attracting data-savvy talent (recruitment and selection)

Several interviewees mentioned that their HR or recruitment departments in their organisations are also going through a transition in order to learn about the new necessary skills and be able to recognise new talent (Int-7) and (Int-5). The data showed that the traditional project management departments are changed by the purposive attraction and

recruitment of other disciplines, such as data engineers, data scientists, data analysts (Int-20), statisticians (Int-7) and software developers – but with not great success (Int-5). At the same time, the data was mixed with regards to attracting specific demographics. For some, mid-careers that also brought some practical industry experience along with being data-savvy was desired (Int-14). For others, apprentices (Int-14) and early graduates (Int-24) were more appealing as companies tried to train them and develop them from the ground up.

Developing data-savvy talent

Developing the data-savvy talent was a prolific topic of discussion among the interviewees. The discussions revolved around two main categories: (a) individual and (b) collective level. At an individual level, some data-savvy talents were not directly recruited as such but were self-taught to code and program for data analysis (Int-20) and eventually after proving the value of these new digital methods they attracted company budget to create growth in their department (Int-2). However, the majority of development was done either through training provided in-house (Int-20) and (Int-1) in masterclasses (Int-24) or webinars (Int-10) and training outsourced to academies, continuous education, vocational education (Int-9) or hiring trainers (Int-4).

At a collective level, the above underline the need for making strategic decisions that change the course of action of HR departments (Int-22) and make deliberate investment and budget allocation for training and development (Int-23) and (Int-8). Several organisations were developing communities of ‘digital natives’ (Int-21) using internal online platforms with special interests for people to learn from one another in a collaborative and organic way (Int-1). It was recognised that developing people would lead to develop teams (Int-23). The development of data-savvy talent also placed an emphasis on teams and highlighted the need to balance skills within the team (Int-2) in order to create high-performing teams (Int-21).

Retaining data-savvy talent

In some companies the data-savviness is still considered a secondary skills and traditional project management skills and relations with the client are more important (Int-9). The data-savvy talent that has been recruited from the software industry is demotivated in more traditional industries such as construction and hard to retain because there are not a lot of ways to apply their skills (Int-4). Making impact with their digital skills and bringing immediate value (Int-4) was found equally important in retaining the data-savvy talent than a higher pay according to (Int-3) and (Int-3), Int-17). Other companies take the retaining for new talents very seriously (Int-24) and try to keep the data-savvy talent happy by involving them in pilot projects (Int-23) or rotating them around different projects to gain more experience and remain stimulated in project work (Int-14). Finally, staying for a relatively long period in the company is seen as an enabling factor in innovating the creating the positive change by applying digital technologies in projects (Int-4).

4.3 Opportunities for managing data-savvy project management talent to deliver projects

Connectivity

Several interviewees acknowledged the potential of datafication and the data-savvy talent in connecting geographies and geographically dispersed teams by using various tools to bring people across continents together to work in projects (Int-1) and (Int-8). Others emphasized also the potential of utilising the various time zones to allow for 24/7 work to be produced (Int-22) and (Int-24). At the same time, connectivity was also related to the opportunity to connect project databases and build new knowledge across project work (Int-2), (Int-8).

Communication

An important theme for managing data-savvy talent to deliver projects was about communication on a number of sub-themes. First, communication was seen as a way to bring people together and a precursor of collaboration as stated by (Int-1), (Int-8) and (Int-4). In a similar vein, collaboration was discussed as ‘hybrid collaboration’ that entails both people and non-people/data things (Int-3). Equally, the data-savvy talent brought opportunities for transforming communication from person-based to platform-based (Int-6), (Int-20), (Int-22). Another opportunity is related to approaching digitalisation as a leveler for providing a democratic platform and equitable media to different project stakeholders (Int-8).

Information management

The most discussed opportunity of managing the data-savvy talent to deliver projects was about the impact on information management. Specifically, it was discussed as an opportunity for allowing project managers to focus only on the value-adding activities removing noise from their work (Int-2). At the same time, this could ensure seamless access to information (Int-14). Another opportunity of managing data-savvy project talent is on streamlining information and requirements management, using appropriate data knowledge for labelling (Int-14), (Int-20) and decision-making and cognitive support (Int-21).

Ultimately, managing data-savvy talent was seen as an opportunity for offering efficient analysis of project data (Int-6), (Int-23). This was seen mostly in alignment with the condition of standardisation of data (Int-21), necessary inside organisations and cross-organisations. Finally, another opportunity for managing data-savvy project management talent to deliver projects was around taking advantage of visualisation functionalities and monitoring of projects (Int-3), (Int-7) by reporting with dashboards (Int-5).

Project delivery

Managing the data-savvy talent was seen as a key opportunity in project delivery by especially ensuring compliance with policy requirements (Int-3). Additionally, managing the data-savvy talent was seen as an immense opportunity in raising project quality (Int-9). The introduction of the data-savvy talent could facilitate the development of all project organisations and support the fast-pacing nature of consultancies and project delivery (Int-9).

Disruption

Managing the data-savvy talent in projects could bring entirely new ways of project management as seen by opportunities for disruption, for instance by instilling a gamification aspect in project work (Int-3) and also democratizing digital technologies through the reverse-mentoring in teams and the establishment of a code-free environment (Int-5). Equally this disruption by the data-savvy talent could avert the more generalized industry disruption by new entrants (Int-13), as the data-savviness will be internalized in projects.

Project work and wellbeing

Finally, an important theme of managing the data-savvy talent in projects brings opportunities across the whole project team, for instance by slowly instilling trust to digital methods across the whole project team (Int-8). In a similar vein, managing data-savvy talent in projects allows project teams to tailor their working environments by taking advantage of digital technologies (Int-14), (Int-21), (Int-22), and allowing organisational flexibility around work (Int-23).

4.4 Obstacles for managing data-savvy project management talent to deliver projects

Connectivity

By managing data-savvy project management talent to deliver projects, an important obstacle was found in diversity, as the data-savvy talent management seems to be continuing the existing gender stereotyping without promoting the entrance of people from different

geographies and of minority gender identification to enter the project world (Int-1) and (Int-8).

Communication

Some of the obstacles of managing data-savvy project management talent revolved around over-communication, for instance increased but unhelpful user/client engagement (Int-3). Another obstacle to communication in managing data-savvy project management talent was lack of communication and lack of client leadership (Int-4), (Int-5), (Int-7), (Int-9), (Int-13) and (Int-23) that was echoed by a large number of interviewees. At a more cognitive level, digitalisation and datafication seemed to contribute to lack of focus (Int-20) among project stakeholders. The various terminologies and buzzwords around digital technologies were also obstacles to communication in managing data-savvy project management talent (Int-23).

Information management

Key obstacles to information management when managing data-savvy project management talent was the lack of standardisation in data handling (Int-7), data integrity (Int-8), data quality (Int-9), infrastructure and data privacy (Int-5). Equally, the lack of historical data (Int-5) made the process of datafication harder. With these large amounts of information to digest, critical thinking was needed in managing data-savvy project management talent (Int-3). Finally, the lack of data-savviness and misinformation around digital technologies was another obstacle to information management when managing data-savvy talent (Int-14).

Project delivery

Regarding project delivery, key obstacles when managing data-savvy project management talent were the competing interests among stakeholders with data sharing and Intellectual Property (IP) issues (Int-20) and data permissions (Int-24). A large number of interviewees

discussed the lack of systems thinking as an important obstacle when managing data-savvy project management talent (Int-7), (Int-13), (Int-14), (Int-20) and (Int-21).

Disruption

The technocratic and software-dominant logic when managing data-savvy project management talent was an obstacle to disruption and radical new ways in projects (Int-9).

Project work and wellbeing

Finally, most of the obstacles when managing data-savvy project management talent were related to project work and wellbeing. These were of two main types: (a) individual and (b) collective. First, regarding the obstacles to individuals, the ‘digital immigrants’ who were born before the digital era less confident than the ‘digital natives’ who were born during or after the digital era (Int-1). Similarly, the ‘digital immigrants’ were afraid of losing their status (Int-4) and were nervous with using new technology (Int-14) and not comfortable to express their opinion (Int-21). As (Int-3) and (Int-24) also mentioned, transparency makes people feel uneasy that causes reluctance to learn new things (Int-5) and (Int-6) and resistance to change (Int-13). Overall, combining digital and project skills was a key obstacle when managing data-savvy project management talent (Int-3).

Second, regarding the collective obstacles, it was reported that there is a generalized lack of modernization in PM (Int-6) that does not align with the historical evolution of the PM field (Int-22). As (Int-5) shared, this is because the organisational development is slower than technology development (Int-20). The traditional and hierarchical organisational culture (Int-4) is another obstacle, given that data-savvy talent management approaches have not become part of the organisational DNA (Int-13). Equally, any digital strategies in an organisation do not materialize higher up the hierarchy of the company (Int-9), there is a lack of buy-in from the C-suite (Int-20) and lack of team leadership (23).

5 Discussion

5.1 Talent Management and managing projects in the digital era

5.1.1 Attracting digital talent

In this section we synthesise the opportunities and obstacles found in the preceding sections vis-a-vis key lessons learnt for talent management and managing projects in the digital era. In so doing, specific attention is also paid to the interactions between ‘digital natives’ and ‘digital immigrants’ that were coined by Prensky (2009) as individuals born during/after and before the digital era respectively.

In relation to the recruitment and selection, there was recognition among the interviewees that as projects become more complex particularly in the context of decision-making where there is a greater need for harnessing the power of integration across disciplines and organisations, digital methods of working and managing data become a critical competence to develop in the project management profession. That said, while digitalisation and datafication for handling higher levels of complexity is an opportunity, the interviewees also saw this as a challenge in current project management practice; problems with integration across disciplines and organisations are longstanding challenges that have confronted the project management profession, and the addition of digitalisation adds to the integration challenge.

A key integration challenge identified by the interviewees lay in the interactions between digital natives (often younger workers) and digital immigrants (often older workers – although this feature is not entirely generational). It was recognized that while younger workers were more adept to using new digital technologies, older workers brought with them other skillsets that are critical to delivering projects such as understanding the collaboration context and the politics of running projects (see also Gillberg and Wikström (2021)). Thus, the

interviewees stressed the importance of valuing different skillsets and finding a way to facilitate productive exchange and interactions between digital natives who can find more efficient ways of using digital technologies to transform the ways work is done in projects and digital immigrants who are more intuitive about knowing what works in project practices. It is interesting to note how the interviewees appear to resonate with recent scholarship that suggest that technical ability is less important than one's openness to learn from others (see Guinan et al., 2019).

Another point worth noting on recruitment and selection lies in the opportunities to extend the workforce beyond national borders. Digitalisation allows organisations to engage with data analysts based abroad, and while this is regarded as an opportunity to tap into talent elsewhere, this can also bring with it challenges in ensuring a coherent (and co-located) approach to managing human resource strategically. In project contexts where the management of human resources is oftentimes more operational than strategic, and where the project team can lack the autonomy to self-select in the formation of project team, opening up the possibilities of having a part of the workforce from abroad can also be presented as an obstacle.

5.1.2 Developing digital talent

Where development of talent is concerned, the interviews highlight four key lessons to consider. First, training on digital technologies featured as a topic of concern. On the one hand, digital immigrants commented that new digital technologies on the market meant that those with skills developed on earlier technologies now found their skills to be less relevant. For example, in managing and analysing schedules for projects, Power BI has now, at least for Int, replaced Microsoft Project and Primavera in her daily practice. This therefore calls into question the scope and content of training that is required so that project management professionals are sufficiently proficient in using the digital technologies. For example, should

the training focus on putting the functions of the digital technologies to work or should the training focus more on the fundamental principles that underpin the functions of the digital technologies? Taking the former approach, there is the risk that upgrades and introduction of new digital technologies might render the skills developed in older technologies obsolete or in need of re-training.

The second aspect relating to training on digital technologies is that there seems to be an expectation that skills associated with the use of digital technologies tend to be developed by learning-by-doing, rather than to follow a structured training course. In some cases, the interviewees have reported either the engagement of an external consultant or an in-house hub support to facilitate learning-by doing. In either approach, there is often a cost (both financial and time/effort) to the parent organisation, and there is often a fear that the expertise developed is lost through the turnover of staff. Digital expertise is well sought after, and this meant that retaining staff with strong digital expertise is a challenge.

A third point relating to digital technologies is the distinction made between technology as a tool and technology as a tool-in-use. In the preceding sections, we have enumerated the various digital technologies on the market that are relevant for project management professionals. However, our interviewees emphasized the importance of understanding how the tools are used in practice, and the purpose of using specific tools for specific purposes. Rather than to focus on technology-as-a-tool, taking a technology-as-a-tool-in-use draws attention to the need to demonstrate, translate and communicate the value of the tools. For instance, while digital tools have strong capability in generating impressive visualizations of various kinds, what was most important for the experienced project managers was how this translated to the everyday simple tools (e.g., an Excel spreadsheet) to facilitate a decision-making point. Thus, through our interviews, we were able to distinguish between

technologies-in-use in various contexts, including the use of digital tools for visualising analyses, for reporting on progress, and for co-creating and co-designing solutions.

It seems that where collaboration was important, there tends to be more emphasis on complementing the use of digital tools with more basic forms of technology (such as flip-charts and post-it notes) (Ewenstein & Whyte, 2019). The topics of connectivity, communications and information management were interrelated and formative, altering the nature of work in projects. This might range from internal communications, information structuring (Whyte et al., 2016) and workplace learning (Papadonikolaki et al., 2019) to external engagement (Ninan et al., 2020) all crucial aspects where new data-savvy talent can be engaged in projects.

A fourth aspect on development relates to the opportunities and obstacles associated with learning from other sectors. While the interviewees recognized that the digital transformation is affecting a broad range of different sectors, they also expressed concern that the opportunities of learning from across different sectors are less prevalent. Movement of project managers from across different sectors is not the norm, and this can stymie knowledge transfer potential in terms of sharing lessons learnt about the experiences of digitalisation in different contexts.

5.1.3 Retaining digital talent

Turning our attention now to the final point on talent management, that of retaining talent. The interviewees reiterated the challenge of retaining younger workers who are often digital natives. Given the demand for digital expertise, and the propensity for younger workers to move jobs due to better (financial) conditions, our interviewees appear to place more emphasis on retention than on recruitment of digital-savvy workers.

In light of the retention challenge, our interviewees highlight several key strategic and operational challenges that need to be taken into account. First, and perhaps a question that is more related to strategic choice, lies the question of whether data and digital work is seen as core (or not) to the business. For some interviewees, the growing power of (big) data analysis is something that project organisations (particularly those working in consulting firms) cannot ignore. Engaging with data science and digital technologies is a way of dealing with growing complexity in the project environment. Yet, as alluded to above in the recruitment of data analysts from abroad, this also raises the question of how to manage these ‘remote’ workers as a strategic core of the business. This partially aligns with Guerra et al. (2023) who found that more emphasis has been placed on retaining than on attracting talent, however it shows that retention is a growing issue in digital talent management.

Given the difficulties of retaining talent with strong capabilities on data analytics and digital technologies, some of our interviewees question whether or not these workers should be seen as core to the project business. If these workers are not seen as core, then the strategy for ‘retaining’ such talent is to see these as resources that can be tapped into through outsourcing. For a number of interviewees, the strategic choice as to whether digital talent is seen as core or not emanates from whether and to what extent the client sees data analytics as fundamental to the delivery of projects. While there is recognition of the power of data analytics and digital technologies to deal with growing complexity of project decisions, others may see the reduction to the digital as not capturing the complexity of social, cultural and political dynamics of managing projects.

Finally, the interviewees also raised questions around the ways organisations structure their interactions between digital natives and digital immigrants, in order to encourage retention of digital talent. For example, mentoring and links between early-career and board-level executives were seen as ways by which organisations can facilitate desirable communication

between early-career and established workers with a view to enable cross-generational learning and the feeling of being valued by the organisation.

5.2 Managerial implications

Due to the highly practical nature of the topic, the study showed concrete managerial directions for further action. The new data-savvy talent requires an upheaval of traditional HRM practices. Most importantly, the attraction or selection and retainment of the data-savvy talent needs to become more structured and strategic, by training the HR department, allocating more generous budget to data-intensive activities/departments and consciously trying to keep the data-savvy talent happy. Human resources managers, project managers and line managers can manage the entrance of new data-savvy talent in a less data-savvy and more traditional environment by providing support and resources to help them integrate into the organisation focusing on both individual but also collective development goals. This can involve providing training and development opportunities to help them learn about the organization's culture and systems, as well as introducing them to key stakeholders and decision makers. HR managers can also facilitate communication and collaboration between the new data-savvy employees and their more traditional colleagues either with face-to-face or online interactions. This can involve setting up regular meetings or workshops to share knowledge and experiences, as well as providing support and guidance to help everyone work together effectively.

5.2 Limitations and future research

Despite the new insights and knowledge contribution put forward from this study, there are some further limitations. First, the sample of the interviews although diverse in terms of experience of the experts in the industry, it was not very balanced in terms of gender and geographical distribution. Although active steps to improve and avert this were taken, it is not an entirely balanced sample. Second, another limitation of the interview sample was the

access to professional institutions. In total three expert interviewees from three different PM professional institutions were included in the sample, but this was the minimum and more views might have provided a broader perspective. the

This study has been accompanied by a survey and a focus group that will be included in future publications. The benefits of this mixed data collection sources are that it creates a more diverse sample, by including various gender orientations, ages and backgrounds. The findings of these other data collection stages will be transposed and synthesised with the present study' findings and discussed in future works.

6 Conclusion

Digital transformation brings a change in the status quo in project management. This study departed from the well-documented technocratic view of identifying the applications and benefits of digitalisation and datafication in projects and instead focussed on the people aspect and particularly how HRM, talent management and managerial agency can leverage and support people in this transition. Of particular importance is the emergence of the new data-savvy talent and how it affects relations in project management. It was found that this data-savvy talent can either grow within firms or be recruited by other sectors, although most talent management practices around recruiting and selecting for digital skills (digital talent management) is unstructured, task-oriented and lacks strategic support.

A promising way forward is leveraging the *connectivity* opportunities of digital technologies to recruit talent from different geographies. Apart from the patchy approach in attracting new talent, retaining this data-savvy talent is also mixed and undeveloped. Our study provided some directions on strengthening the development of talent management through in-house activities that promote *communication* or outsourced training programmes and focusing on technology-in-use as opposed to technology as a tool as well as learning lessons from other

sectors that can bring *disruption* to the traditional project management sector. Project delivery and *information management* were seen as transactional vessels to promote a testbed for developing and stimulating the data-savvy talent. Finally, regarding retaining the data-savvy talent, an emphasis on teamwork, *project work and wellbeing* is a promising way forward that can look beyond the individual level of the phenomenon into bringing collective action and impact to project teams. This study brings new insights for business leaders, who should make digital talent management a more strategic priority to stay relevant as well as computer science and engineering education in schools, colleges and universities for not only equipping novices with new tools and skills but also educating them about the value of digitalisation and its contribution in bettering society and business.

7 Acknowledgements

This study is an outcome of the 2022-2023 Project Management Institute (PMI) Sponsored Research Grant.

8 References

- ALKHUDARY, R. & GARDINER, P. 2021. Stages in project managers' careers: Learning and growth opportunities. *International Journal of Project Management*, 39, 536-545.
- ALVESSON, M. & KÄRREMAN, D. 2007. Constructing mystery: Empirical matters in theory development. *Academy of management review*, 32, 1265-1281.
- BAZELEY, P. 2020. Qualitative data analysis: Practical strategies. *Qualitative Data Analysis*, 1-584.
- BREDIN, K. & SÖDERLUND, J. 2011. The HR quadriad: a framework for the analysis of HRM in project-based organizations. *The International Journal of Human Resource Management*, 22, 2202-2221.
- EWENSTEIN, B., & WHYTE, J. (2009). Knowledge practices in design: the role of visual representations asepistemic objects'. *Organization studies*, 30(1), 07-30.
- FEREDAY, J. & MUIR-COCHRANE, E. 2006. Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International journal of qualitative methods*, 5, 80-92.
- GILLBERG, N. & WIKSTRÖM, E. 2021. Fading away at work: "I could have left without saying anything"—performing talent management in a multinational organization. *Journal of Organizational Effectiveness: People and Performance*.

- GIOIA, D. A., CORLEY, K. G. & HAMILTON, A. L. 2013. Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational research methods*, 16, 15-31.
- GRAEBNER, M. E., MARTIN, J. A. & ROUNDY, P. T. 2012. Qualitative data: Cooking without a recipe. *Strategic Organization*, 10, 276-284.
- GUERRA, J. M. M., DANVILA-DEL-VALLE, I. & SUÁREZ, M. M. 2023. The impact of digital transformation on talent management. *Technological Forecasting and Social Change*, 188, 122291.
- GUINAN, P. J., PARISE, S. & LANGOWITZ, N. 2019. Creating an innovative digital project team: Levers to enable digital transformation. *Business Horizons*, 62, 717-727.
- HAVERMANS, L., VAN DER HEIJDEN, B. I., SAVELSBERGH, C. & STORM, P. 2019. Rolling into the profession: Exploring the motivation and experience of becoming a project manager. *Project management journal*, 50, 346-360.
- HENNINK, M. M., KAISER, B. N. & MARCONI, V. C. 2017. Code saturation versus meaning saturation: how many interviews are enough? *Qualitative health research*, 27, 591-608.
- JENSEN, A., THUESEN, C. & GERALDI, J. 2016. The projectification of everything: Projects as a human condition. *Project Management Journal*, 47, 21-34.
- LEWIS, R. E. & HECKMAN, R. J. 2006. Talent management: A critical review. *Human resource management review*, 16, 139-154.
- MARNEWICK, C. & MARNEWICK, A. 2021. Digital intelligence: A must-have for project managers. *Project Leadership and Society*, 2, 100026.
- MAYER-SCHÖNBERGER, V., & CUKIER, K. (2013). Big data: A revolution that will transform how we live, work, and think. Houghton Mifflin Harcourt, Boston
- NAMBISAN, S., LYYTINEN, K., MAJCHRZAK, A. & SONG, M. 2017. Digital Innovation Management: Reinventing innovation management research in a digital world. *Mis Quarterly*, 41.
- NINAN, J., MAHALINGAM, A., CLEGG, S., & SANKARAN, S. (2020). ICT for external stakeholder management: sociomateriality from a power perspective. *Construction management and economics*, 38(9), 840-855.
- PAPADONIKOLAKI, E., KRYSTALLIS, I. & MORGAN, B. 2022. Digital Technologies in Built Environment Projects: Review and Future Directions. *Project Management Journal*, 87569728211070225.
- PAPADONIKOLAKI, E., VAN OEL, C. & KAGIOGLOU, M. 2019. Organising and Managing boundaries: A structural view of collaboration with Building Information Modelling (BIM). *International Journal of Project Management*, 37, 378-394.
- ROBINSON, W. G., CHAN, P. W. & LAU, T. 2016. Sensors and sensibility: examining the role of technological features in servitizing construction towards greater sustainability. *Construction management and economics*, 34, 4-20.
- ROSS, J. (2017, September 29). Don't confuse digital with digitization. MIT Sloan Management Review. <https://sloanreview.mit.edu/article/dont-confuse-digital-with-digitization/>
- SALDANÁ, J. 2009. *The Coding Manual for Qualitative Researchers*, London, UK, Sage.
- SCHOPER, Y.-G., WALD, A., INGASON, H. T. & FRIDGEIRSSON, T. V. 2018. Projectification in Western economies: A comparative study of Germany, Norway and Iceland. *International Journal of Project Management*, 36, 71-82.
- STEEN, J., KLEIN, G., & POTTS, J. (2022). 21st-Century General-Purpose Technologies and the Future of Project Management. *Project Management Journal*, 53(5), 435-437.

- STIER, H. & HERZBERG-DRUKER, E. 2017. Running ahead or running in place? Educational expansion and gender inequality in the labor market. *Social Indicators Research*, 130, 1187-1206.
- WHYTE, J., 2019. How digital information transforms project delivery models. *Project management journal*, 50(2), pp.177-194
- WHYTE, J., STASIS, A. & LINDKVIST, C. 2016. Managing change in the delivery of complex projects: Configuration management, asset information and 'big data'. *International Journal of Project Management*, 34, 339-351.
- WIJAYASEKERA, S. C., HUSSAIN, S. A., PAUDEL, A., PAUDEL, B., STEEN, J., SADIQ, R. & HEWAGE, K. 2022. Data analytics and artificial intelligence in the complex environment of megaprojects: Implications for practitioners and project organizing theory. *Project Management Journal*, 53, 485-500.