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Integration of AI with Agile Project Management in the Context of Sustainability

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Because when projects succeed, society benefits

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Executive summary

1.1 Project overview

Project management provides a structured approach to solving organisational challenges. It is a way for organisations to plan, implement, and bring innovative ideas to reality. Many organisations have a sustainability focus as a result of changes happening in their industries. Sustainability means integrating appropriate environmental, social, and governance ideas into the operations, products, and plans of the organisation, with a focus on the future and finding a balance. In fact, many organisations are forced to focus on sustainability in order to both stay relevant and competitive.

Agile project management is one of the most prevalent discussion topics within project management. Despite this, minimal academic research has been carried out on the subject and its intersection with sustainability initiatives.

Our research aims to change this. Our research question is: "Which human factors are needed for the integration of agile project management to achieve success?". This is framed within the context of sustainability, along with the increasing use of digital tools, especially artificial intelligence (AI), in agile project management. Our research integrates the use and importance of human factors in agile projects that apply evolving AI tools, to explore the success of those projects as they relate to sustainability.

To answer how AI and other digital tools have impacted agile projects within the domain of sustainability, we looked at how we could build on previous research. Recent advances in digital tools have promised greater efficiency, faster data analysis, and possible changes in the ways that projects are managed. How has this translated into action, and what trends are emerging in these projects that have a focus on sustainability? Some research in this area includes research from the University of Southampton's Advanced PM Research Centre ("APM Understanding Agile Project Management"), research from Senapathi & Drury-Grogan (2017), and our previous publication (Burga et al., 2022). This research provides an understanding that agile project management can be framed through a number of perspectives: the integration of human factors found in the agile team, the technological factors implicit in agile ways of working, and organisational factors.

In this research, we focus on agile projects because of their prevalence and use in the information technology (IT) sector and the role of IT in our daily lives. We are careful to define digital tools on a broad basis to avoid the misinterpretation that could result if we name all digital tools as AI. By looking beyond AI tools, we avoid limiting and constraining the possibilities, and we recognise that many advances in digital tools combine multiple technologies in one platform.

1.2 Key findings

We have a number of findings:

- The human factors needed within sustainability projects to achieve success are:
  - trust
  - acceptance of and comfort in the use of digital tools
  - training on the use of digital tools.
- If the respondent works in an agile or hybrid agile environment, they are more likely to adopt digital tools. We found that a high level of trust when connected with digital tool adoption positively impacts project success.
- Respondents who believed that digital tools contributed “a great deal” or “a lot” tended to report higher percentages of success in their projects. Those who reported that they had a greater trust in digital tools also believed that these tools had a positive impact on the success of their projects. This suggests that greater trust in digital tools is associated with higher project success rates.
- We also found that a hierarchy of digital tools is in use. Basic tools such as Miro and Microsoft Teams offer relatively little in terms of advances and improvements compared with tools such as ChatGPT (from OpenAI) and Jira (from Atlassian). Respondents suggest that, while advanced tools based on generative AI are highly valued and are perceived to have significant potential, their current impact on project success is modest. This could imply that success may depend more on the effective application of these tools than on the tools’ sophistication alone.

Project practitioners working in sustainability will increasingly find that their work is impacted by digital tools. Knowing where and when to use these tools will be an important skill and differentiator. Project practitioners will need to be intentional about the tools that they introduce to their organisation.

Our findings will help inform managers and teams of the appropriate conditions required to make best use of the available tools. In order to realise their possible value, managers must have fostered a culture of trust around the tools and set up the conditions for success.

Introduction

2.1 Background and significance

As researchers working in the project management space, we have been exploring the project management literature for some time. Our previous research focused on the experience of implementing agile practices within nine teams in the financial services sector. These teams were new to agile project management and, as such, we proposed a framework describing how IT project teams experience accountability arrangements when transitioning to agile ways of working (Burga et al, 2022).

On starting this research, our initial investigation revealed minimal published academic work that directly looks into the impact of digital tools on project success (Mesa Fernández et al., 2022) within the context of sustainability. Vial and colleagues (2023) find that a combination of logics (rules) that involve project management operating process, agile ways of working, and AI workflow can lead to conflict but, if managed appropriately, can lead to project success. Interestingly and importantly, building on this topic, we believe that there are implications for those working in project management for a further exploration of the interaction of the human elements with these digital tools. Given the relative novelty of the topic, we struggled to find a starting place to answer the common question: "How should you approach and start to use these tools as a practitioner?"

Our research question grew to be: "Which human factors are needed for the integration of agile project management to achieve success?". We wanted to frame this within the context of sustainability, along with the increasing use of digital tools, especially AI, in agile project management. We wondered whether there are differences in the use of tools depending on the size of the project. We also wanted to find out which tools are most used and most impactful.

Current research on digital tools in project management is focused on specific tools and their impact on the conduct of the project (Taboada et al., 2023; Mesa Fernández et al., 2022, Vial et al., 2023). In particular, the project management literature that focuses on agile describes the categories of human capital, technical tools, and organisational resources as key elements that lead to successful agile work (Senapathi & Drury-Grogan, 2017; Vial et al., 2023). However, research is lacking on the implications of the human interface with digital tools for those working in project management. How should practitioners approach these tools?

From an initial exploratory qualitative discussion with project management experts, we teased out several categories of digital tools based on their complexity, ranging from low-complexity tools (e.g., document-handling software and platforms, and office productivity suites) through slightly more complex tools (e.g., Microsoft Project), to moderately complex tools, such as Tableau by Salesforce and Microsoft Power BI, to highly complex digital tools encompassing software development platforms, such as the open source Eclipse IDE and advanced generative AI tools such as OpenAI's ChatGPT. These tools are used to varying degrees in project management, and people's ease and trust in these tools may affect the success of projects. We wanted to explore this situation and, therefore, answer our research question.

We undertook both a quantitative and qualitative survey aimed at those working in the project space in order to capture the latest insights into what is taking place.

Through this research, we have been able to provide insights into what is impacting project management in North America. Of our 127 survey responses, 80 included a direct connection between agile/hybrid approaches and sustainability, which provide us with a statistically significant sample set representing multiple industries, which can be analysed to provide fresh insights into, and understanding of, the state of project management.

2.2 Scope and limitations

Our research focuses on currently practising practitioners – North American participants who participated in our survey between May and September 2024. Our decision to focus on North American participants stems from our regional base and existing connections in the project space.

We were limited to self-selecting participants. Given that we received a statistically significant response rate of 127, 80 of which being valid responses directly connected with agile/hybrid and sustainability, we were able to continue our analysis and reach useful conclusions. However, as we relied on self-reporting, there may be some response bias that could restrict the generalisability of conclusions.

The survey captures perceptions at a single point in time, which limits any insights into changes over time. Variability in project types and industries among respondents may also impact the consistency of findings, while the focus on digital tool usage and sustainability might not encompass all relevant project management factors.

In running our survey and receiving results using our convenience group of participants, we may have inadvertently introduced some bias. Our respondents being somewhat connected within relevant networks or communities may lead to overrepresentation of certain social or professional networks. This possibly limits the generalisability of the survey results to the broader population of project managers.

2.3 Research methodology

In looking at the topic of sustainability, the range of digital tools, and evolving ways of working in project management, especially in agile, we are working in areas adjacent to previous researchers. We researched the connections between the human elements within teams and their impact on project success, and looked at how these three topics play a role in project success because success is a large topic area in project studies.

We looked at sustainability because of the increased prevalence of sustainable initiatives and the importance of their metrics in modern organisations where environmental, societal, and governance concerns play an important role. We focused on a range of digital tools because of their prevalence in IT projects. We looked at a variety of project types and team sizes to see how these additional factors impact project success. Our research sought to close the gaps in our understanding of how factors such as trust, communication, and teamwork connect in agile projects to achieve success in sustainability-focused organisations.

In order to understand the current situation in organisations, we built a survey and received responses from those currently working in project management. Our survey was purposely wide ranging, looking at four important elements that we believe contributed to or influenced project success in 2024. These were:

- digital tool adoption
- human factors such as trust and readiness to use the tools
- sustainability practices
- guidelines, policies, and usage of tools.

We received 127 survey results, 80 of them directly connected to agile/hybrid and sustainability, providing us with a statistically significant sample set. Our survey was distributed via a convenience sampling technique using the authors' network of professional and personal contacts. Using the sample group of 80 results, we arrived at the conclusions which follow.

We used OpenAI's ChatGPT-4o to help us with the analysis and visualisation of our data and to interpret findings.

Literature review

3.1 Definition and importance of addressed topic, key themes, models, or frameworks

The academic literature examining the integration of agile project management in the context of sustainability highlights the transformative impact of new technology on project outcomes. Studies describe digital tools as enhancing efficiency, team communication, and data management. There is some research on the connection and causal link between digital tools and project success. A few empirical studies show the direct contribution of digital tools on improved project performance.

Research often emphasises tools like project management software, analytics platforms, and cloud-based collaboration to show that these technologies support real-time monitoring, resource allocation and risk management (Taboada et al., 2023; Vial et al., 2023). Findings suggest that integrating digital tools with sound project management practices can significantly boost success rates by improving agility, transparency, and accountability.

The following three studies provide a similar background to our research:

- "Emerging technologies and principle-based project management: A systematic literature review and research agenda" by Aamer et al. (2024) examines how emerging digital technologies influence project management principles and contribute to project success. Emerging digital technologies are described as innovative, rapidly evolving technologies that have the potential to significantly disrupt traditional practices and create new opportunities across various domains. These technologies are characterised by their novelty, capacity to improve efficiency, and potential to transform processes and decision-making in project management. The integration with project management practices with these technologies offer significant opportunities for project management.
- "How do project managers' competencies impact project success? A systematic literature review" by Ochoa Pacheco et al. (2023) analyses the impact of project managers' competencies, including digital proficiency, on project outcomes. The article identifies leadership, communication, and emotional intelligence as key project manager competencies influencing project success, emphasising personal and social dimensions.
- "Digital project management: Rapid changes define new working environments" by Wu (2022) discusses the adoption of digital technologies in project management and their effects on team collaboration and project efficiency. The article looks at how the COVID-19 pandemic accelerated the shift from traditional project management to digital methodologies. In discussing the adoption of digital tools, the evolving role of project managers, the rise of virtual teams, and the associated benefits and challenges of remote collaboration, Wu emphasises that digital project management is poised to remain integral post-pandemic. He urges organisations and individuals to embrace this transformation while being mindful of its complexities.

Research design and methodology

4.1 Research approach

Using our understanding of the relevant literature, the current state of project management and sustainability, and the emerging trends in digital tools, we developed a research survey.

Questions in our survey were directly connected with supporting literature to ensure that each question had an appropriate and relevant theoretical background. Because we expected participants to have limited time and focus, we ensured that each question was supporting and directed towards our research themes while ensuring validity, and that the question was supported in the academic literature. We drew on a Delphi panel of practising project managers, academics, and subject matter experts to validate the survey. We subsequently edited the survey to reflect their input and then distributed it more broadly.

4.2 Data collection methods and sampling strategy

Our final research survey consisted of 32 questions and was distributed via a convenience sampling technique that used the authors' network of professional and personal contacts. The sampling strategy started with contacts that we personally knew who were working in industry. As these contacts finished the survey, we asked them to suggest friends or colleagues who might be willing to complete the survey. Using this process, we were able to receive 127 usable results.

We collected demographic information relating to the participants' project roles, their years of experience in their roles, and their gender. We also collected information on the project methodologies that they had used in the past two years, the type of project experiences they had had, their average team size and budget, the number of projects they had worked on, the number of successful projects they had worked on, and measures of success for their recent projects. Within the context of sustainability, we collected information on participants' use of digital tools, identifying those tools and their impact on their projects and the success of those projects, their reflections on which measures of success are impacted by the tools, the levels of team trust and adoption of digital tools, the impact of the tools on collaboration, the impact on project success, and the preparedness of project teams to adopt digital tools.

4.3 Data analysis techniques

Our data was composed of demographic and survey questions related to the use of digital tools in project management processes. Therefore, our data analysis consisted of visualisations of the demographic data, the project success data, characteristics, use of digital tools and types of projects. We ran a regression analysis to address our research question about the impact of human elements on the relationship between the adoption of digital tools and project success. The results are described in section 5.6.

Findings and analysis

5.1 Demographics and background

The respondents represented a wide range of project professionals with different backgrounds:

a) **Roles**: The respondents represent a wide range of roles, from project sponsors to coordinators, reflecting a variety of experience levels in project management. A significant portion of respondents have over a decade of experience. The most common job titles include "Project Manager" and "Director of Project Management", indicating a balanced mix of mid-level and senior-level professionals.

b) **Project methodologies**: All the respondents in our filtered dataset (80 responses) were using agile or hybrid approaches in their projects.

c) **Experience in current role:** A significant portion of respondents have substantial experience in their current roles, with many reporting more than 10 years in their project roles. This brings a wealth of expertise, which is particularly valuable in understanding long-term project trends and methodologies. This is illustrated in Figure 1.

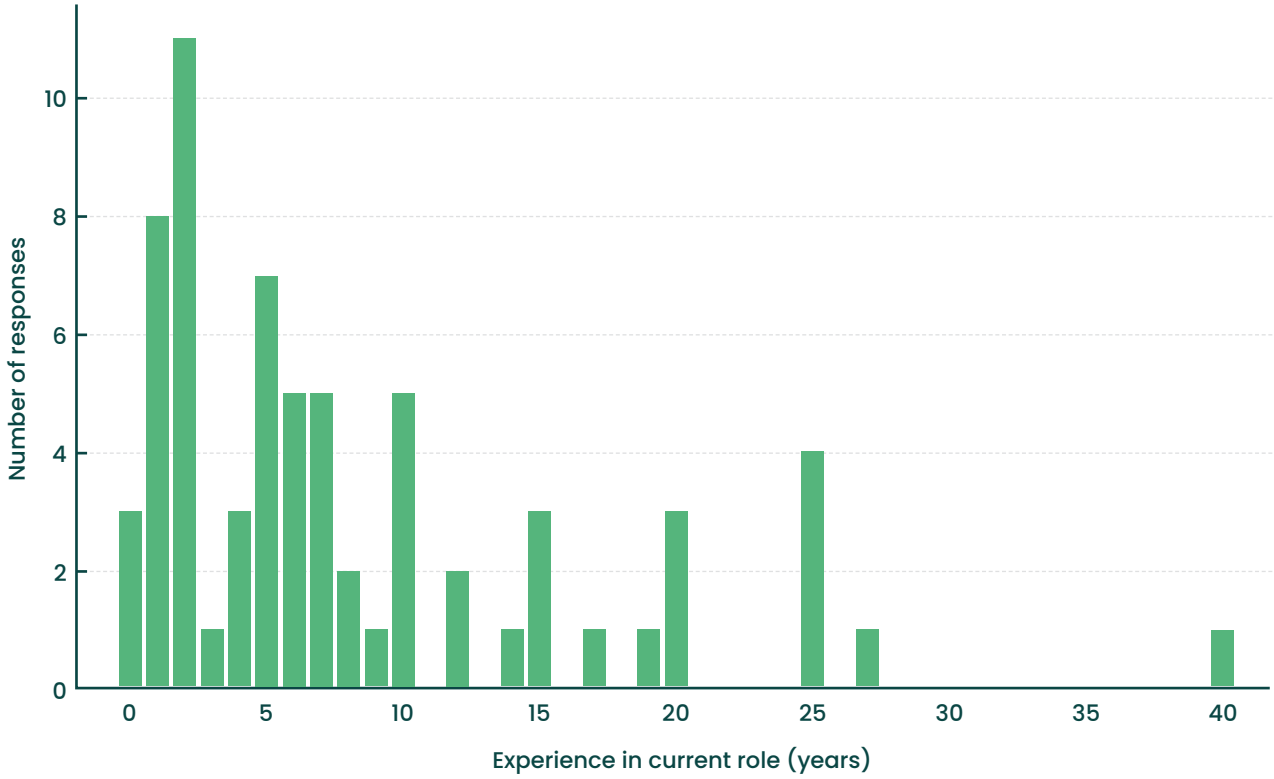

Figure 1 Experience in current role for agile and sustainability projects

d) **Types and numbers of projects:** Respondents were involved in a variety of project types, reflecting diverse industries and organisational priorities. These project types, as shown in Figure 2, include:

- software development and integration projects
- hardware and infrastructure projects, where traditional, predictive approaches like waterfall are more common
- HR/talent-related projects, which may require flexibility in project methodologies to address team and organisational dynamics.

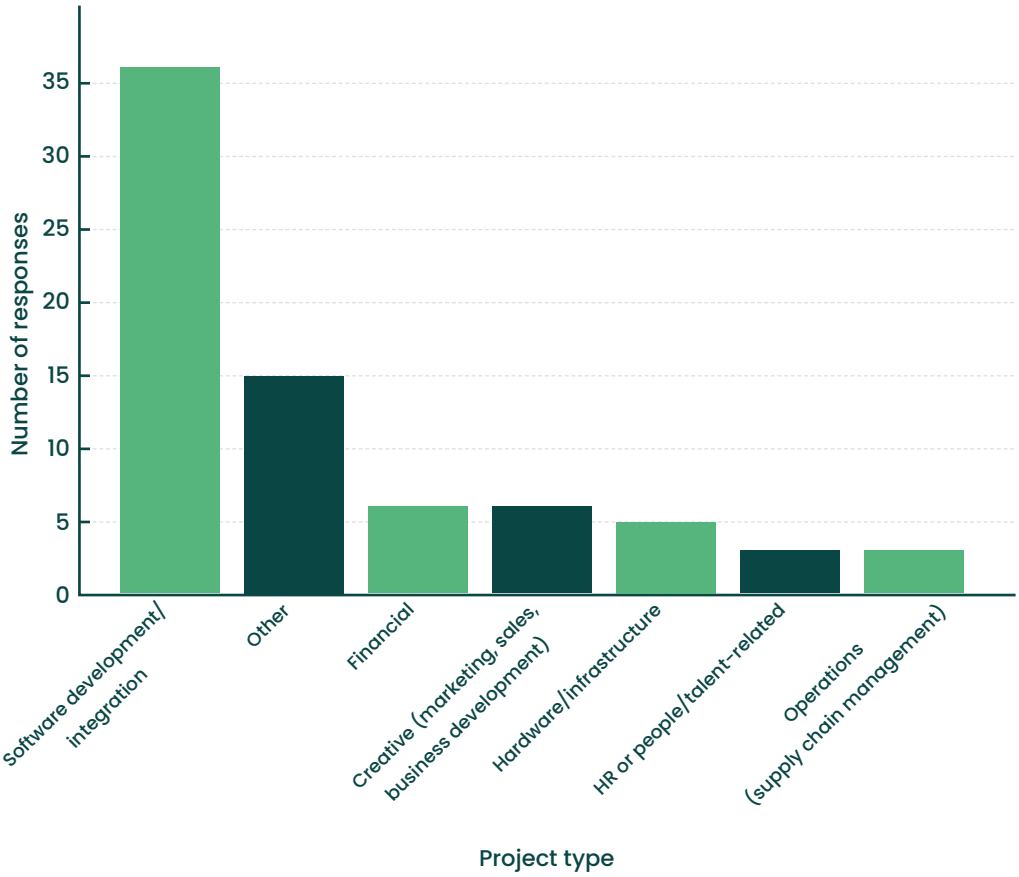

Figure 2 Diversity of project types in agile and sustainability projects

Other project types include:

- creative/e-commerce
- embedded software and hardware
- research and development
- Enterprise Resource Planning (ERP) – cross-company digital transformation
- oversight of IT projects and implementation.

e) **Project volume:** There is some variation in the number of projects that individual teams have taken on during the last two years. The majority of respondents report managing multiple projects in the past two years, with some handling 6–10 projects. Surprisingly, we had more than one response who handled 20+ projects (see Figure 3). This demonstrates both the scalability of project management practices and the ability to handle a high project volume.

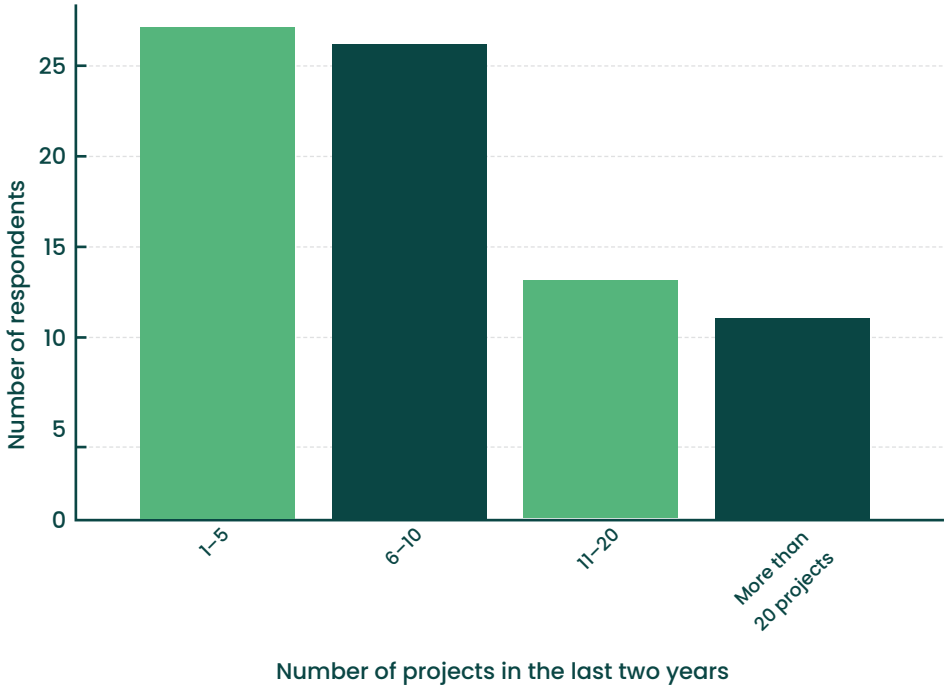

Figure 3 Project volume in the last two years

f) **Project team size:** As shown in Figure 4, team sizes vary, with many respondents working in teams of 15 to 100 members.

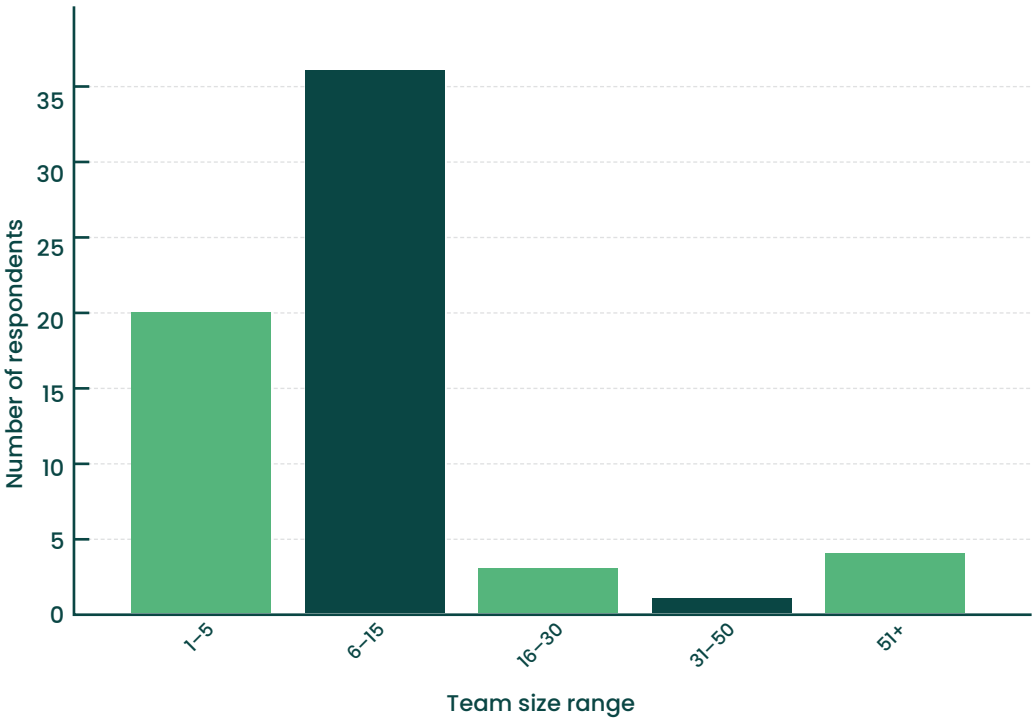

Figure 4 Average team sizes in the last two years (grouped)

5.2 Moderate readiness overall

Most respondents rated their teams as having moderate readiness for increased digital tool use. This suggests that, while teams are adopting tools, there are varying levels of confidence in fully integrating these tools into their actual daily workflows and tasks. Readiness is closely tied to both experience with the tools and perceived value, indicating that the transition is in progress but not yet universally embraced. Figure 5 illustrates the level of readiness perceived by the participants.

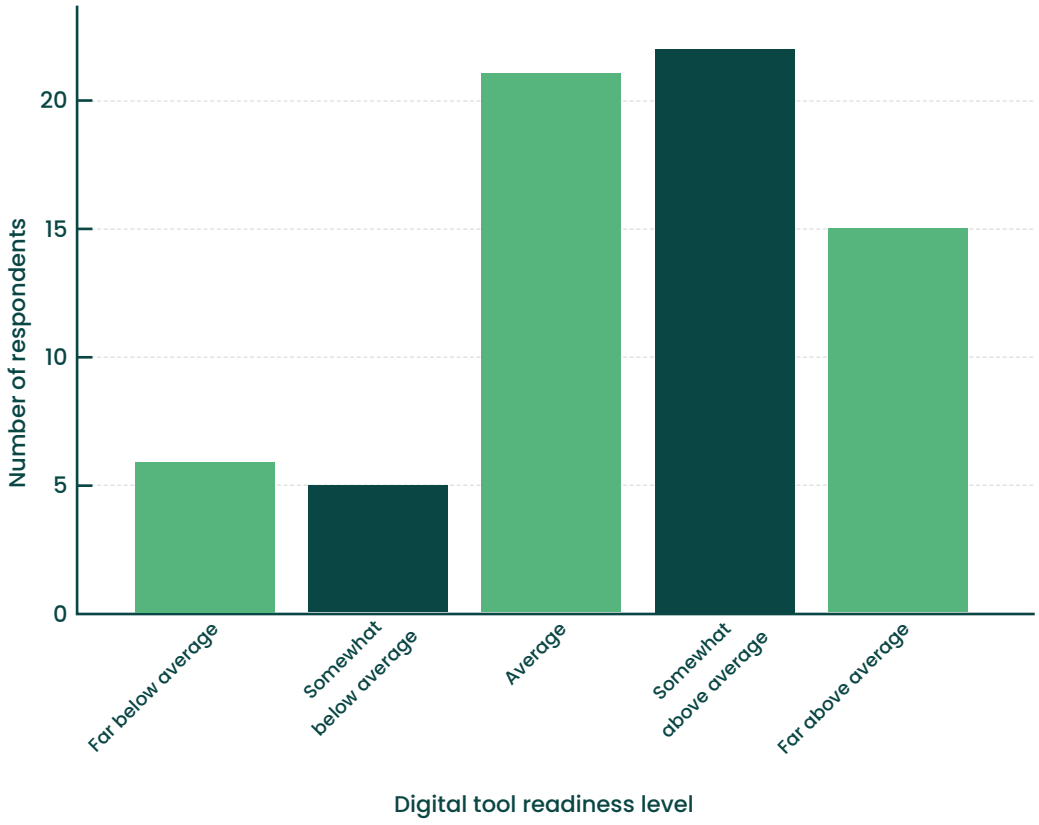

Figure 5 Digital tool readiness levels

When a respondent is thinking about readiness, they are thinking about whether their team has the background and culture to make the tools work within their context. This is closely tied to both experience with the tools and their perceived value, indicating that the transition is in progress but not yet universally embraced. We see this play out in which digital tools are actually being used, as shown in Figure 6.

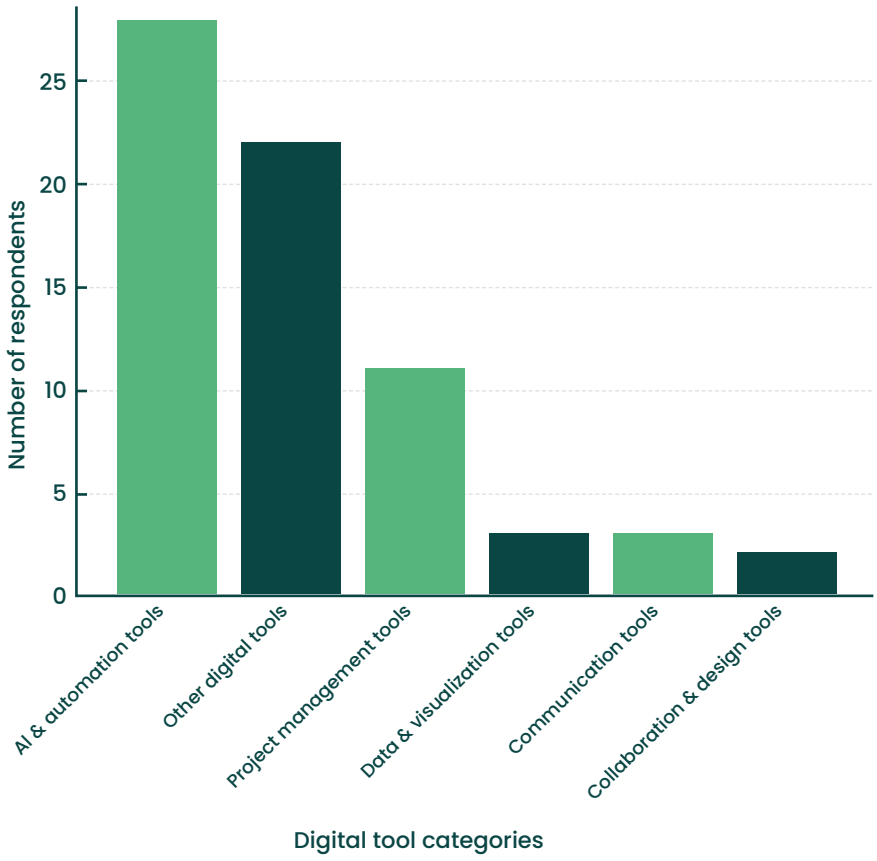

Figure 6 Most commonly used digital tools

5.3 Tool-specific impact on roles

Project management will be impacted by digital tools. How much do survey respondents expect their roles to change as a result of digital tools?

Survey respondents who have been in their roles for longer (10 years on average) report a "moderate" expected impact of digital tools on their responsibilities. In contrast, those with slightly shorter tenures (around 8 or 9 years) tend to expect a greater or lesser impact, suggesting experience may influence adaptability expectations. This is illustrated in Figure 7.

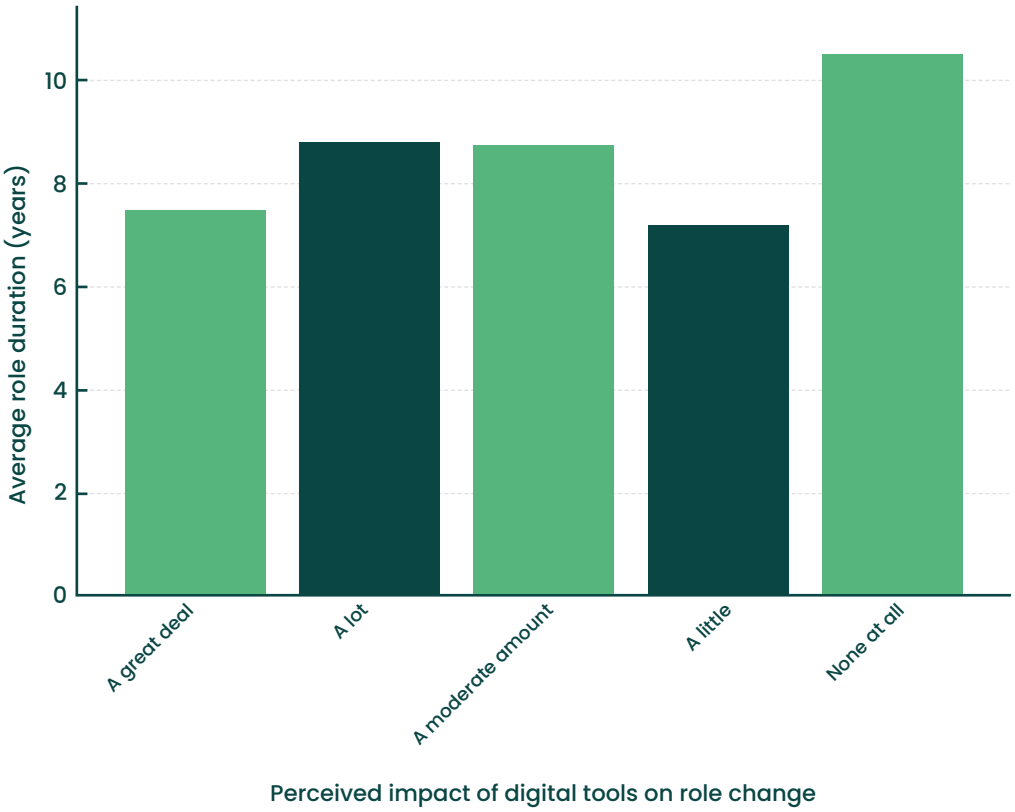

Figure 7 Average role duration by perceived impact of digital tools on role change

5.4 Does the use of digital tools contribute to project success rates?

The box plot (Figure 8) shows the correlation between the perceived contribution of digital tools and the average success percentage of projects. It illustrates how different levels of tool contribution relate to project success rates. The box plot indicates the distribution of responses, with the mean responses shown as a line within the bulk of the responses (the boxes).

Those who feel digital tools had "a great deal", "a lot", or "a moderate amount" of impact report higher success rates on average. Those who do not use digital tools to the same extent report lower success rates on average.

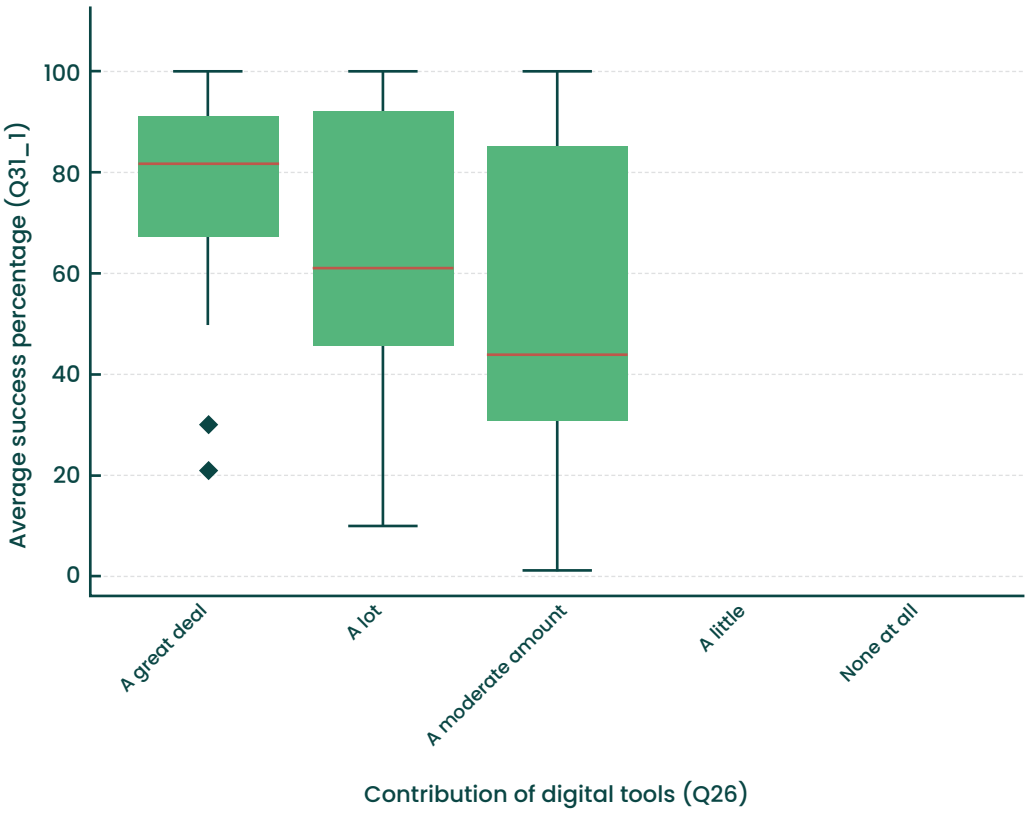

Figure 8 Correlation between digital tools contribution (Q26) and project success (Q31_1)

As the perceived contribution of digital tools to collaboration increases, the median sustainability embeddedness (Q31) also tends to rise.

There is greater variation in sustainability integration for projects where digital tools contribute “a lot” or “a great deal”, suggesting that, while digital tools can improve project success, other factors might also be at play.

Projects where digital tools contribute “none [nothing] at all” or “a little” to collaboration tend to have lower sustainability embeddedness, indicating that effective digital tool adoption may support stronger sustainability principles in projects.

The bigger question is: Does digital tool use improve project success overall? The correlations suggest a positive but not definitive relationship between digital tool adoption and project sustainability/success. Digital tools appear to support collaboration and sustainability integration, but more direct success metrics (such as budget adherence, schedule performance, or stakeholder satisfaction) would be needed for a stronger conclusion.

5.5 Trust in digital tools and the impact on project success

Some correlations around trust were found in the survey results. The heatmap in Figure 9 visualises the correlations between digital tool adoption metrics and success indicators.

Figure 9 is a Pearson correlation matrix which visually represents the strength and direction of the linear relationship between two or more variables. Each value in the matrix, ranging from -1 to 1, indicates the degree of association between a pair of variables. A correlation close to 1 signifies a strong positive relationship (as one variable increases, the other also increases), a correlation close to -1 indicates a strong negative relationship (as one increases, the other decreases), and a correlation near 0 suggests little to no linear relationship. The colour gradient highlights the strength and direction of each correlation, with stronger positive correlations shown in red and negative correlations in blue. This helps to identify the most significant relationships at a glance.

Figure 9 Correlation heatmap of digital tool adoption and success indicators

The strongest correlations from the analysis are as follows:

1. Readiness for digital tools and trust in digital tools (0.75):
    - This high positive correlation suggests that teams more prepared for digital tool usage also tend to have greater trust in these tools. This relationship implies that readiness and trust are linked, with more readiness likely to foster trust in the adoption process.
2. Sustainability integration and sustainability percentage (0.77):
    - This correlation indicates a strong connection between the integration of sustainability principles in project teams and the proportion of projects with a sustainability component. This result suggests that teams embedding sustainability practices tend to work on a higher percentage of sustainability-focused projects.
3. Sustainability percentage and sustainability visibility (0.65):
    - A moderate-to-strong positive correlation here indicates that, as more projects have a sustainability focus, clients or end users perceive sustainability as more visible or important. This points to a reinforcing cycle where visible sustainability efforts lead to a greater share of such projects.
4. Trust in digital tools and impact on team collaboration (0.53):
    - This positive correlation suggests that higher trust in digital tools is associated with improved team collaboration. Teams that trust digital tools may be more willing to use them in ways that enhance collaboration.

Overall, these correlations indicate that trust and readiness for digital tools, as well as integration and visibility of sustainability, play connected roles in project success and team dynamics.

Our survey responses also indicate varying degrees of trust among project managers regarding digital tool adoption:

- Very high trust: 15.4% of respondents expressed “a great deal” of trust in digital tools.
- High trust: 33.3% reported “a lot” of trust.
- Moderate trust: 35.9% expressed a “moderate amount” of trust.
- Low trust: 12% of respondents are more cautious, expressing “a little” trust.
- No trust at all: 3.4% reported no trust.

The overall sentiment leans towards moderate-to-high trust, though a minority of participants had reservations or outright distrust.

Trust in digital tools has a positive and statistically significant impact on project success, suggesting that greater trust in digital tools is associated with higher project success rates.

The boxplot in Figure 10 shows project success across different levels of trust in digital tools, with higher trust levels generally associated with a greater range and median of success.

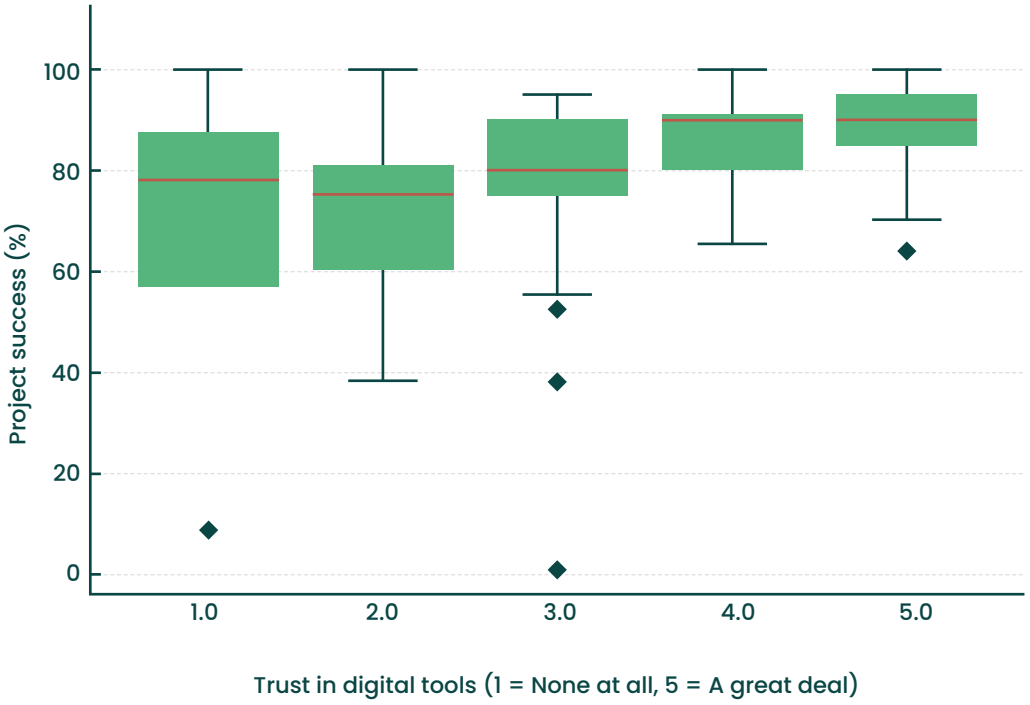

Figure 10 Project success by trust in digital tools level

5.6 Statistical investigations using regression analysis

To gain a greater understanding of what our survey results have told us, we focused on questions relating to the relationship between how the adoption of digital tools on project success is impacted by team trust in the adoption of the tools.

Using statistical tools (a moderation and interaction test), we looked to gain a better understanding of the whole of the results. Moderation in statistics is like a dimmer switch on a light by changing the relationship between two to test how strongly one aspect affects the other.

Our hypothesis was that the use of digital tools (which is our independent variable) improves project success (which is our dependent variable), and this relationship is moderated by team trust. We thought that if trust of digital tools within the team is high, the impact of digital tools on project success will be stronger. If trust within the team is low, the impact of digital tools on project success will be weaker. We tested this moderation effect with our regression analysis.

By carrying out our linear regression analysis with R (a programming language/ software environment for statistical computing and graphics), we analysed our hypothesis. We started with a moderation analysis where we looked at the impact of trust and collaboration on project success in relation to digital tool adoption. Trust as one of the moderators between digital tool adoption and project success was measured by asking the participants how much trust the project teams had with the adoption of digital tools as part of their work.

Our tests of the results show a normal distribution of results. This distribution was found by using the Kolmogorov-Smirnov test. This test checks whether a dataset follows a specific distribution by measuring the biggest difference between their cumulative probabilities. There is no collinearity of data results. Collinearity can cause problems in regression analysis as it may provide misleading or redundant results. It occurs when two or more independent predictor variables are highly correlated. This means that one predictor variable can be linearly predicted from another with a substantial degree of accuracy. Our model was able to explain 25% of the variance in the data.

We found, unsurprisingly, that there was a positive link between trust in the adoption of digital tools and project success. However, the interaction of trust on the link between digital tool adoption and project success was the opposite of what we expected. If the intention to adopt digital tools is held at a fixed value then a higher level of trust with this adoption as led to lower project success. This may indicate an overconfidence bias in the adoption process of digital tools as influencing project success.

To gain further insights in the context of sustainability, as defined by environmental and societal sustainability, we also ran a second linear regression model which included the impact of sustainability on project success. It explained 36% of the variance in our results. Projects that were perceived to be high in sustainability positively predicted project success.

In summary, the finding is that, when the intention to adopt digital tools is high, it positively impacts project success but there is an additional variable that increases or decreases this relationship. This variable is the trust in the adoption of digital tools. We looked to see if there is actually a significant interaction because, if there is one, it would be important to consider.

We found that the higher the trust in the adoption of digital tools within the team, at constant levels of adoption, there was a decrease in the impact of digital tool adoption on project success. Our hypothesis that that the adoption of digital tools impacts project success is proven to be true. However, this relationship is the opposite of what we expected and may be explained by an overconfidence bias within the team regarding the adoption of digital tools. Note that the statistical findings may be obtained from the authors on request.

5.7 Team size and the connection to project success

The correlation between team size and project success is approximately -0.194, suggesting a slight negative relationship.

Figure 11 indicates that, as team size increases, there may be a slight tendency for project success to decrease. However, the strength of this relationship is relatively weak, so team size alone does not strongly influence project success for those who answered our survey.

The scatter plot in Figure 11 shows the correlation between team size and project success. Each point represents a project cited by our survey respondents, with the x-axis being the team size and the y-axis being the project success percentage.

The Pearson correlation coefficient between team size and project success is -0.38, with a p-value of 0.029. This indicates a statistically significant negative correlation, as the p-value is below the typical significance threshold of 0.05. In summary, larger team sizes are associated with lower project success, and this relationship is statistically significant.

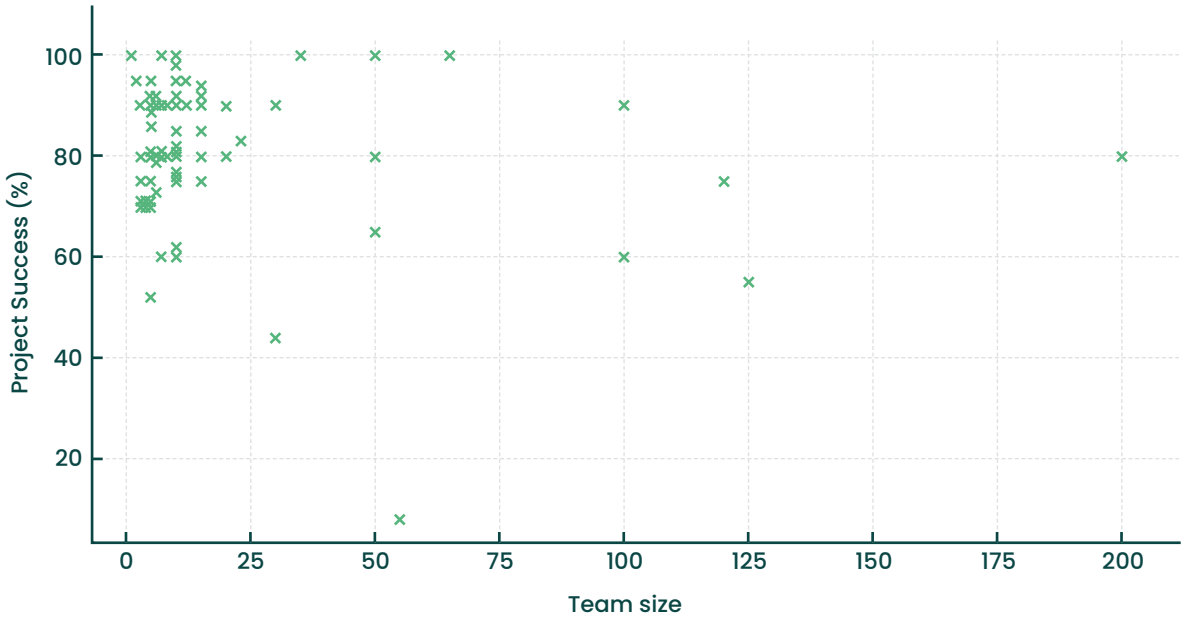

Figure 11 Correlation between team size and project success

5.8 Types of digital tools in use and the hierarchy of their use

We further explored whether certain digital tools are associated with higher success perceptions and success rates. We can break down the analysis into two key parts:

1. **Digital tools vs. success perception**: Identifying which digital tools are associated with respondents who perceived that these tools made a higher contribution to project success.
2. **Digital tools vs. success percentage**: Finding out which tools are linked to higher actual project success rates.

Examining how the use of specific digital tools correlates with respondents' success perceptions, and analysing how those tools correspond with project success percentages, led to the following key observations:

- **AI/large language models (e.g. OpenAI, ChatGPT)**: Users generally perceive these tools to contribute "A moderate amount" to success, with an average project success rate of 68.5%.
- **Cloud storage tools** (e.g., OneDrive, SharePoint, Google Drive): These tools often contribute "A lot" to success, with some projects reporting high success rates of up to 90%.
- **Collaborative tools** (e.g., Microsoft Teams, Slack, Jira, Asana): Interestingly, the most common perception is "None at all", but the average success rate remains fairly high at 69%.

This suggests that, while some tools, such as cloud storage, are strongly perceived as contributing to success, others, such as collaborative tools, may contribute to high success rates despite their lower perceived contributions.

Hierarchy or types of tools in use

In our analysis of the survey responses, we found that there is a hierarchy of digital tools in use. The most basic tools offer relatively little in terms of advances or improvements compared to those considered more advanced. The responses suggest that, while advanced tools like AI are highly valued and perceived to have significant potential, their current impact on project success is modest. This could imply that success may depend more on the effective application of these tools than on the tools' sophistication alone.

Here is a summary of some of what we found:

Digital tool frequency:

1. AI is the most frequently mentioned tool, with 15 references, followed by Jira (7), ChatGPT (5), and Tableau (2).
2. Collaboration platforms like Miro, Teams, and Confluence were also mentioned but less frequently.

Correlation analysis:

1. There is a low positive correlation between the tool impact score and project success percentage (0.12), suggesting a slight association between perceived impact and project success.
2. The tool future potential score shows a weak negative correlation with project success, indicating that the perceived future potential of tools might not directly relate to current project success rates.

The data suggests that, while advanced tools like AI are highly valued and perceived to have significant potential, their current impact on project success is modest. This could imply that success may depend more on the effective application of these tools than on the tools' sophistication alone.

Our analysis shows that projects utilising advanced tools, such as AI, Jira, and Tableau, have a higher average success rate:

- without advanced tools: 78.5% average success rate
- with advanced tools: 82.7% average success rate.

This suggests a positive impact of advanced tools on project success, with projects that use these tools achieving slightly higher success on average.

Other observations:

1. Collaboration and communication benefits: A recurring theme in responses is the positive effect of digital tools on team collaboration. Respondents reported that tools facilitate communication, task tracking, and project visibility, which enhances overall project efficiency. Teams that regularly use these tools report feeling more connected and informed about project progress.
2. Readiness for regulatory and policy changes: While digital tools promise efficiencies, readiness for policy and regulation compliance in using these tools appears moderate to low. Respondents expressed concerns about whether their organisations' policies have been updated to accommodate new digital processes. This gap suggests that teams may be hesitant about fully embracing certain tools before regulatory frameworks are clearly established.

5.9 Industries and areas of work of respondents

Respondents to our survey work in a number of industries. Figure 12 is a visual representation the different industries represented in our survey results.

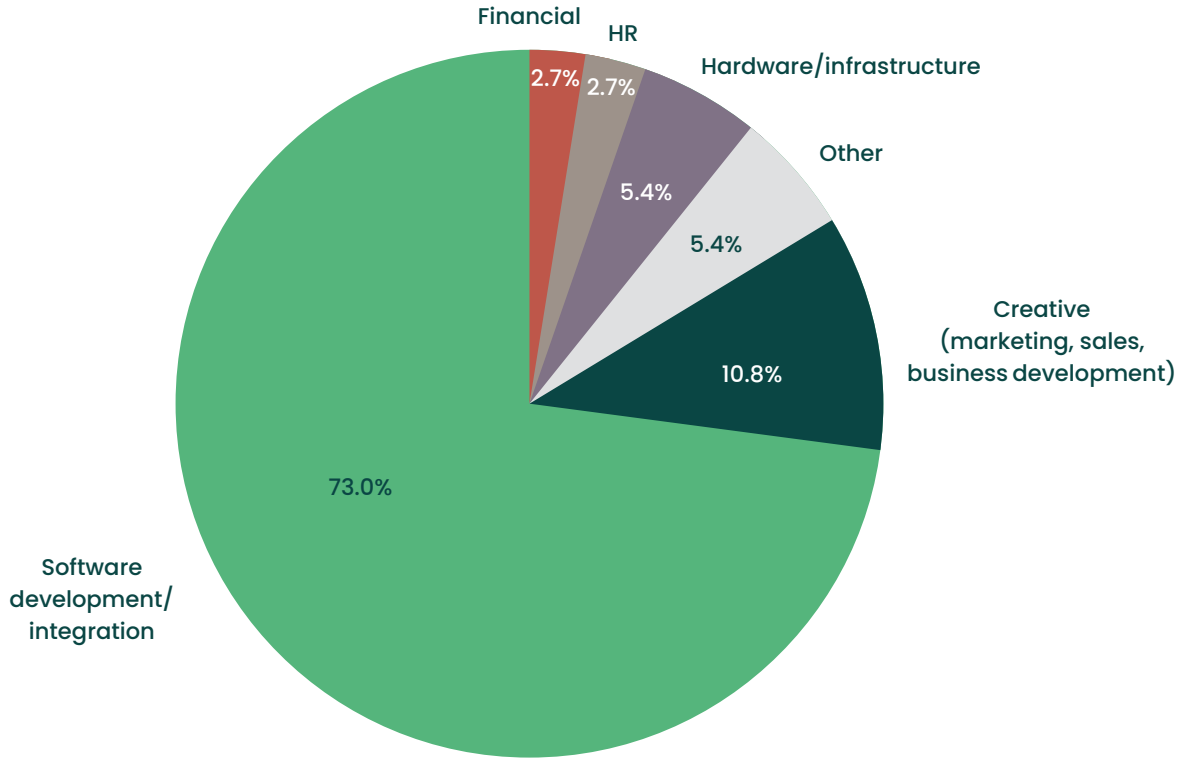

Figure 12 industry distribution for agile/iterative methodology

Discussion and analysis

6.1 Discussion

We are in the early days of research connecting agile and AI within the context of sustainability. Not all areas of project management are changing at the same speed or in parallel. Those working on agile projects are more likely to adopt digital tools than others. Agile teams have been some of the early adopters and have seen some of the quickest benefits.

Respondents who believed that digital tools contributed "a great deal" or "a lot" tended to report higher success percentages in their projects. Those who reported that they had a greater trust in digital tools also believed that these tools had a positive impact on the success of their projects. This suggests that greater trust in digital tools is associated with higher project success rates.

We focused on agile projects because of their prevalence and use in the IT sector and because of the role of IT in our daily lives, including the increasing use of AI tools. We looked at sustainability due to the increased prevalence of these initiatives and the importance of their metrics in the current environment of environmental, societal, and governance concerns.

In terms of the underlying management theories relevant to our survey, the theory of affordance has stated that project participants can use digital tools in ways that they feel will benefit them, but this theory does not account for their impact and improving success rates in projects. For this outcome, we draw on the technology acceptance model (Davis, 1989) that emphasises the positive adoption of technology predicated on the perceived ease of use and perceived usefulness of the technology.

We found that projects with a higher digital tool adoption also tend to have higher sustainability connections. We also found a moderate correlation (0.36) between the percentage of projects linked to sustainability and overall project success. This suggests that teams using digital tools more effectively may also be working on projects with sustainability considerations, with the combination of the two leading to higher success rates.

Currently, there is relatively little research directly looking into the impact of digital tools and their implications in this area of project management. In our research and through our findings, we provide some suggestions for how project practitioners working on agile projects within the context of sustainability can approach these tools.

Our research question ("Which human factors are needed for the integration of agile project management to achieve success?") found that these factors were trust and the team's readiness to adopt digital tools. This research question is framed within the context of sustainability, along with the increasing use of digital tools, especially AI, in agile project management.

6.2 Implications for project management practices, approaches, and the future

The use of digital tools is increasing and organisations will see many benefits by bringing these tools and the mindset of using them into their project teams.

Organisations that start small with their use, that look for methods for improving project outcomes using digital tools, and that create policies and guidelines to govern and control their use, will see benefits sooner. Organisations where tools are introduced later, and where trust is not being established, will not realise the expected benefits.

In summary, while digital tool readiness is growing among agile project teams, complete adoption is hindered by variations in trust, comfort with using the tools, and the availability of training and resources. Ensuring these areas are addressed could enhance overall tool efficacy and the readiness for digital integration in project management.

Conclusion

7.1 Summary, key contributions, and takeaways

We find that the adoption of digital tools in itself does not lead to project success. Instead, the variables that define human factors affect the impact of digital tool adoption on project success. In other words, individuals involved in project work who trust and accept the use of digital tools have a significant and positive impact on project success.

When we ran a linear regression model, we found that a team that is not ready to trust digital tools can negatively impact project success. The implications are that teams need training and help to be able to adopt digital tools. This will help team members to accept the tools and gain more benefits from them as a result.

We also find that there is a hierarchy of digital tools in use. The simplest tools offer relatively little in terms of advances and improvements compared to those considered to be more advanced. The respondents suggest that, while advanced tools like AI are highly valued and perceived to have significant potential, their current impact on project success is modest. This could imply that success depends more on the effective application of these tools than on the tools' sophistication alone.

We find that trust in, and readiness for, the use of digital tools matters. Teams that are more prepared for digital tool usage tend to have greater trust in these tools. This relationship implies that readiness and trust are important moderators that impact project success. Teams with higher trust in digital tools tend to experience better team collaboration. This might be because teams that trust digital tools may be more willing to use them in ways that enhance collaboration.

In summary, while readiness for using digital tools is growing among project teams, complete adoption is hindered by differences in trust, regulatory preparedness, and the availability of training and resources. Ensuring these areas are addressed could enhance overall tool efficacy and the readiness for digital integration in agile project management.

7.2 Areas for future research

This research is suitable for use as a framework that can be built on by subsequent researchers. Additional investigations into the conditions allowing digital tools to thrive would represent excellent additions to this topic.

Investigations into organisations that combine digital tools with project management practices and which result in increased success would also be excellent additions to project studies.

Studies that delve into more detail on the specifics of the digital tools that are being used, and the implications of the human interface with digital tools for those working in project management, would also add to the body of knowledge in this area.

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