



Digitalisation in construction report 2024

November 2024

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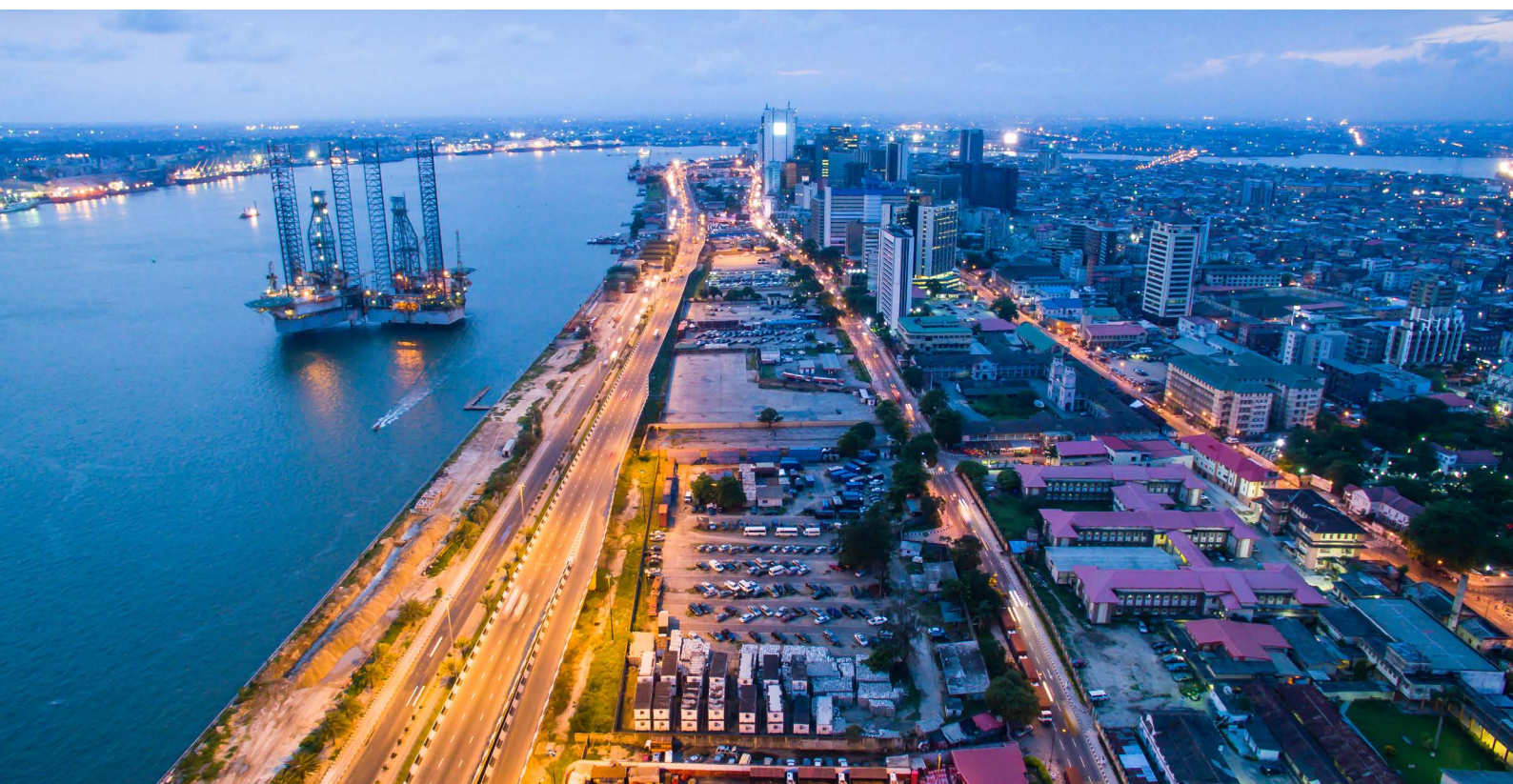
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Forewords

Construction is one of the oldest industries in the world. And with that comes a reputation of being slow to change. If you were to go to a typical construction site of any size in any part of the world, you would likely see construction practices that have not changed in decades.

Nevertheless, there are pockets of innovation. New technologies have already radically transformed a number of traditional industries such as banking, travel and retail. Yet, as this report shows, digital adoption has stalled in the construction industry. Recovering from the particular pressures of the pandemic, it appears the industry is sticking with the tried and trusted. However, new technologies, tools and techniques offer opportunities for those bold enough to adopt them.

Pandemic levels of urgency may have receded, but other factors still demand change. Skills shortages persist globally: innovation that either reduces labour demand or better manages the available workforce is a vital part of solving this problem. Meanwhile, there are increasing legislative, investment and reputational requirements for sustainable practices and certifications. This additional demand for data and information may be best met by adopting digital tools, which is why it is disappointing to see that only a quarter of respondents routinely use such tools.

The principal reason given for not adopting digital tools is cost and effort. A lack of client and stakeholder demand is also cited. This may be a cautious approach, but it is not risk-free.



Tina Paillet
RICS President

As operators in other sectors have found, standing still results in their business models being disrupted by others willing to do things differently. We should not assume that our sector is so different that it cannot happen to us.

We must also remember that our clients' expectations will change as technology delivers benefits in other areas of their businesses and their personal lives. They will work with those in construction who can meet their demands better or faster: in the future, this will mean those best able to realise the advantages of digitalisation.

In this context, the current situation presents a moment of choice. While some firms are forging ahead with new technologies, we are not yet at the tipping point in adoption. After that point, it will be harder to catch up. Right now, there is time to assess new products, adopt new approaches and get ready for the digital revolution.

Quantity surveyors are at the heart of building projects; we are often involved from conception through to completion and beyond. Our skills and expertise underpin the success of major investments. As a profession, we have always sought to do the best for our employers and clients, and adopted new ways of working to achieve this.

Digital tools are already well-embedded in the work of most quantity surveyors, and this can be seen in the report, where digitalisation of cost and quantity data is prominent. However, there is increasing demand for modelling, measuring and monitoring more than this. In that context, it is striking that more than half of respondents do not apply digital tools to whole-life or whole-asset approaches.

In fact, we see a digital divide opening. The number of respondents using these tools on all projects is slowly increasing, but there remains a significant group not adopting digital technologies. This is not simple intransigence: only a small proportion deny that digitalisation offers improvements, but many remain on the fence.

It is also noticeable that it is newer areas of measurement and reporting – carbon, ESG and social value – that show the highest proportion of those unconvinced by digitalisation's promised improvements.



Justin Sullivan
RICS President Elect

This may reflect a broader lack of understanding of these areas. Ironically, good digital tools may actually help us tackle any knowledge gap and deliver the services demanded in these areas, but there is a clear role for RICS in supporting professionals to develop their understanding.

Overall, as companies and individuals get used to having, leveraging and using more data and information across business and society, expectations of what we can and should deliver will increase. The digitally-empowered surveyor will be in demand.

Executive summary

The uptake of digitalisation in the built environment sector, which saw a surge during the pandemic, appears to have plateaued in the two years following the global disruptions. The [Q4 2023 RICS Global Construction Monitor](#) (GCM) indicates no significant progress or growth compared to the 2021 and 2022 survey results.

While it is alarming that we do not see further progression in usage and improvements, the latest survey indicates a notable positive shift in sentiment towards artificial intelligence (AI). The focus has moved from basic digitalisation to harnessing AI, particularly generative AI, for prudent decision-making and innovation. As AI continues to evolve, we may witness a renewed interest in digital tools and technologies in the construction sector.

With pressing demands from the climate crisis, housing affordability, inefficiency in existing assets, infrastructure shortages and a need for better social outcomes, digitalisation is essential for the construction sector. The barriers to adoption are well-known, making it crucial for industry leaders to move beyond recognising the problem and take decisive action to enhance the integration of digital technologies.

The RICS GCM survey relies on professional sentiment monitoring, which has been [proven to predict market movements accurately](#). Industry leaders utilise the GCM alongside other resources for trend assessment and market analysis.

Integrating digitalisation-related questions into the GCM helps gauge market sentiment in the construction sector. Repeating these questions annually allows RICS to track adoption levels and forecast sector trends.

Additionally, these annual reports document ongoing barriers, challenges and progress towards digitalisation in the industry. This year's report examines global responses from the Q4 2023 GCM, which concluded in January 2024, and highlights relevant changes since the [2022 and 2023 reports](#).

The 2023 survey findings indicate that, despite anticipated positive advancements from AI, especially GenAI, the overall adoption rate has remained unchanged. The most troubling news is this: the adoption rate has stagnated in critical areas like carbon emissions calculations and whole-life carbon assessments, which show no improvement.

1 Introduction

At the headline level, Q4 of the 2023 RICS GCM saw construction workloads edge higher, driven predominately by growth in infrastructure. The Middle East and Africa (MEA) and the Americas continued to see a broad expansion in activity, while trends were more variable across the UK, Ireland, Europe and Asia Pacific (APAC). Construction cost inflation projections for the twelve-month period reduced across most nations.

In addition to the regular set of questions, the Q4 2023 GCM sought the opinions of thousands of professionals about the pace and impacts of digitalisation across the sector. Contributors were asked to share their thoughts on four aspects of digitalisation in construction.

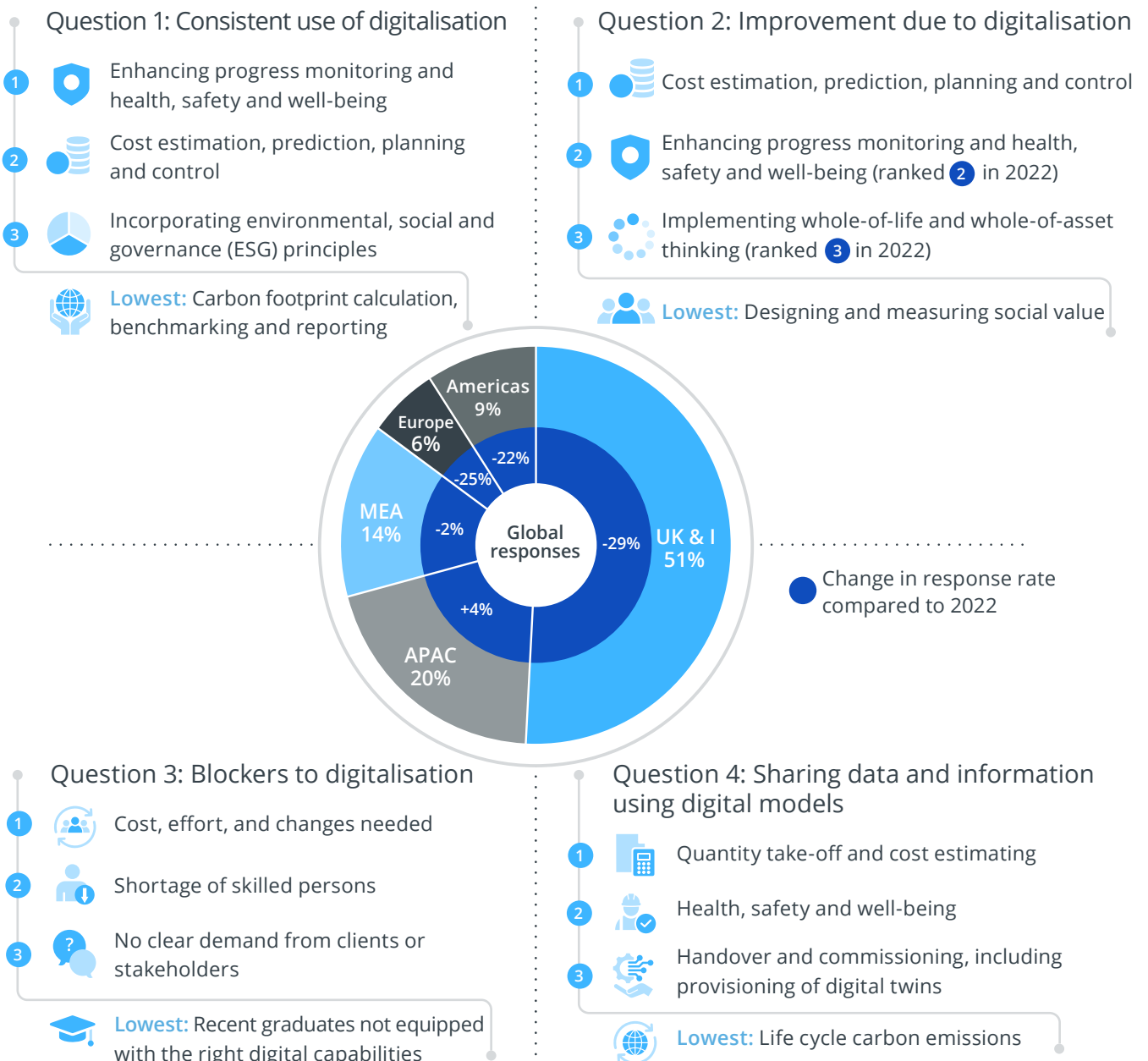


Figure 1: Summary of findings from digitalisation questions in comparison with 2022 results

In Q4 2023 the total number of responses decreased by 20% compared to 2022 but was 14% higher than the initial survey of 2021. The regional distribution of respondents is shown in Figure 2 (MEA denotes Middle East and Africa; APAC denotes Asia Pacific).

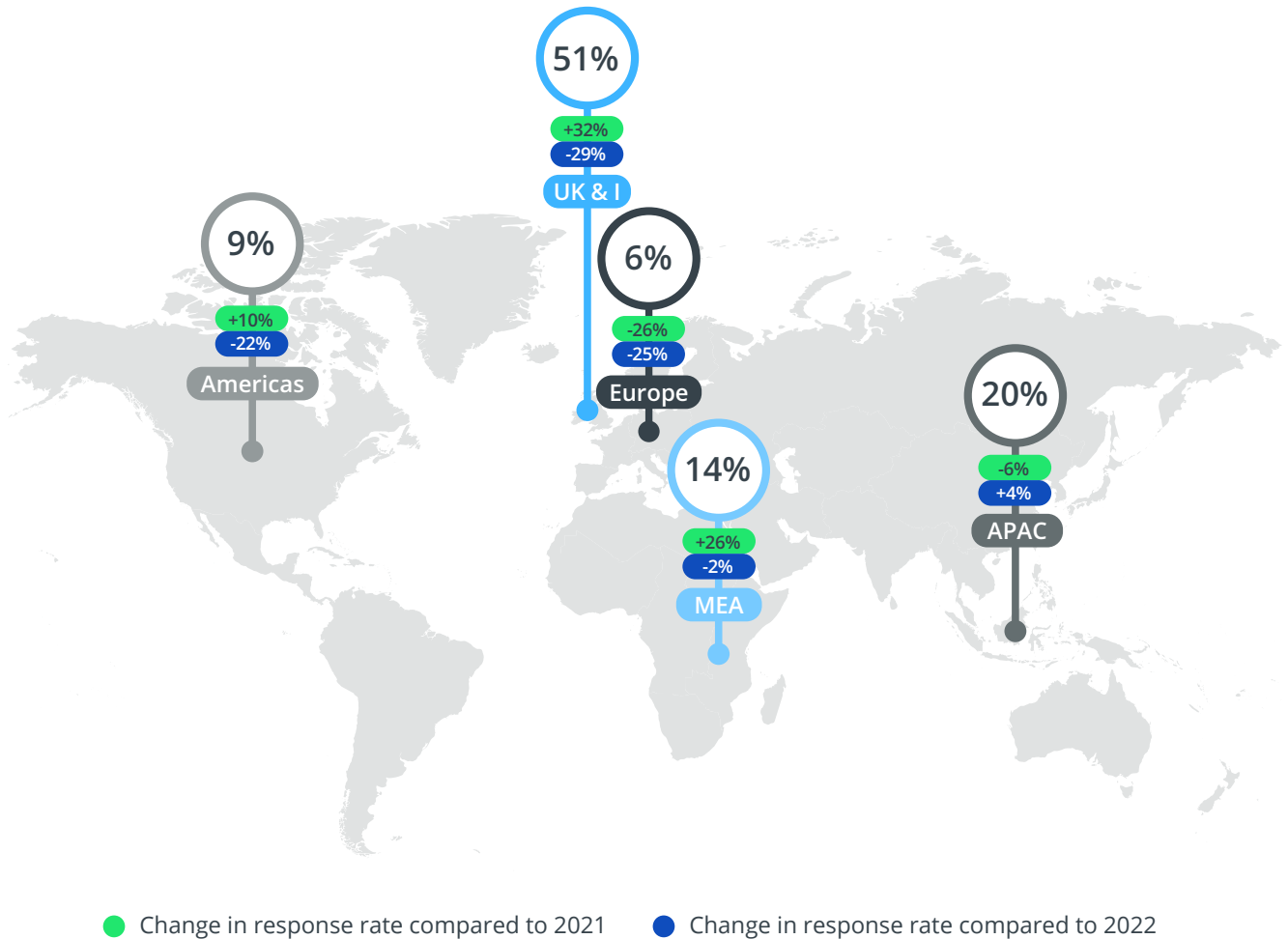


Figure 2: Regional responses and change in response rate over time

2 Consistent use of processes and practices driven by digitalisation

As can be seen from Figure 3, use of digitalisation varies across six functions, with the highest overall usage reported for 'cost estimation, prediction, planning and control' and the lowest usage for 'designing and measuring social value'.

My organisation consistently uses processes and practices driven by digitalisation (defined as BIM or digital twins) for:

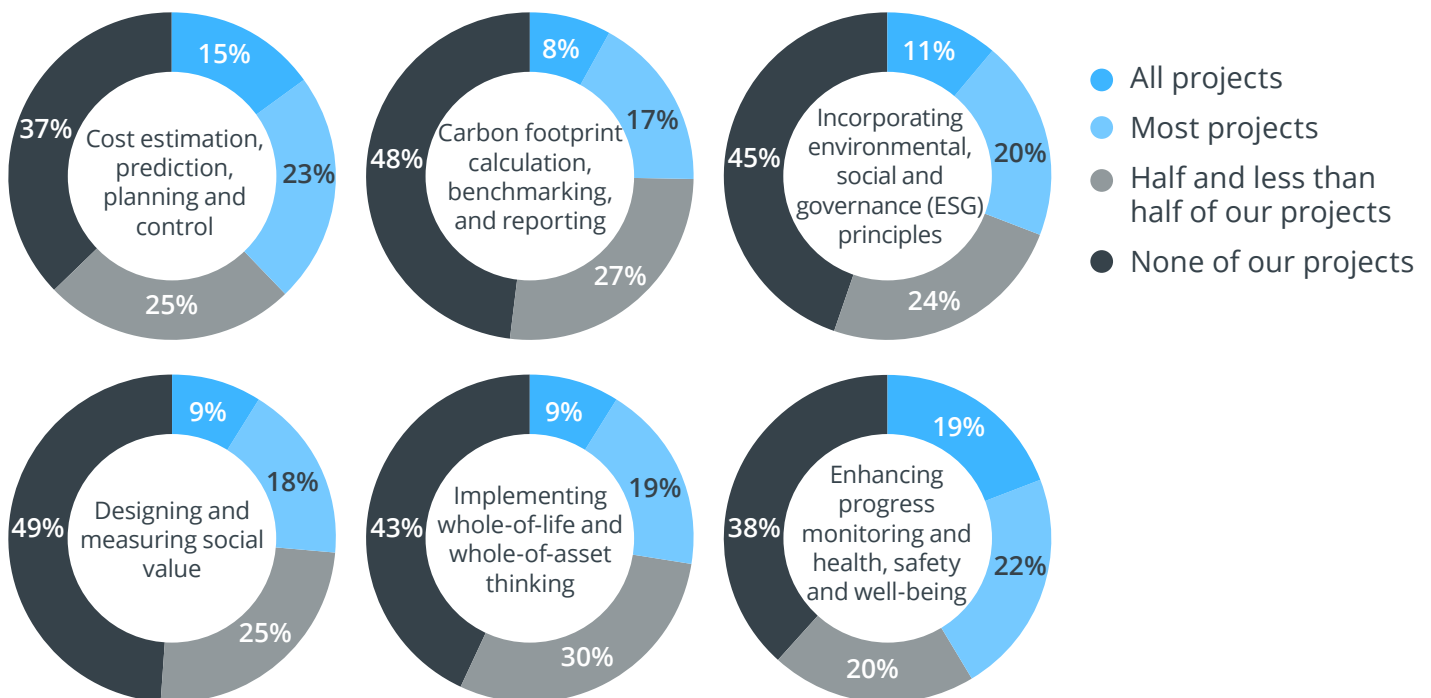


Figure 3: Consistent use of processes and practices driven by digitalisation (note: values may not total 100% due to rounding)

There was no significant movement in the percentage of respondents using digital tools on all their projects; the average percentage across all six functions remains at 12%. The percentage of respondents using digital tools on most of their projects increased from 18% to 20%. There is a slight decrease in the percentage of respondents stating they use digital tools on either half, less than half or none of their projects across the six functions. This was just over 68% of respondents in 2023, compared to 70% in 2022 and 71% in 2021.

Most concerningly, the proportion of respondents not using digital technologies on any of their projects across the six listed functional areas showed a slight increase, from 40% in 2021, to 42% in 2022 and 43% in 2023.

The results show no change in the top three areas (considering 'all projects' and 'most projects' responses) where digital technologies see the most reported usage:

- 1 Enhancing progress monitoring and health, safety and well-being
- 2 Cost estimation, prediction, planning and control
- 3 Incorporating environmental, social and governance (ESG) principles

Around 41% reported using digital technologies for 'enhancing progress monitoring and health, safety, and well-being'. The corresponding average was 39% in 2022 and 38% in 2021, showing a slight positive movement in adoption.

48% reported not using digital technologies at all for 'carbon footprint calculation, benchmarking and reporting', which also ranked lowest in the 2022 and 2021 surveys. Only 8% of contributors reported using digital technologies for this function on all their projects.

Using the relative importance index (RII) on the responses to Figure 3 shows a ranking of adoption and a slight positive shift in adoption over time (see Table 1).

Uses	RII		
	2024 (Q4 2023 survey)	2023 (Q4 2022 survey)	2022 (Q4 2021 survey)
Enhancing progress monitoring and health, safety and well-being	0.56	0.54	0.54
Cost estimation, prediction, planning and control	0.54	0.53	0.52
Incorporating environmental, social and governance (ESG) principles	0.49	0.47	0.47
Implementing whole-life and whole-asset thinking	0.48	0.47	0.46
Designing and measuring social value	0.47	0.45	0.44
Carbon footprint calculation, benchmarking and reporting	0.42	0.43	0.42

Table 1: RII ranking of use

This ranking reflects the influence of market drivers, the regulatory landscape and barriers that have led contributors to focus on different process and practice areas to a greater or lesser extent.

Similarly to the 2021 and 2022 survey findings, the 2023 results include regional variations in ranking these functions by level of use (Table 2).

Contributors from the Americas and Europe reported the highest levels of adoption of digital technologies for 'cost estimation, prediction, planning and control' (RII of 0.61 and 0.56, respectively), while 'enhancing progress monitoring and health, safety and well-being' came second (RII of 0.56 and 0.52, respectively).

While the 2023 results show a slight uptick in the level of use for 'carbon footprint calculation, benchmarking and reporting', it is still ranked in the bottom three uses based on RII.

However, responses from Europe and the UK for this function placed it (RII of 0.47 and 0.53, respectively) slightly above 'designing and measuring social value' (RII of 0.45 and 0.52, respectively).

	AMR	APAC	Europe	MEA	UKI
Enhancing progress monitoring and health, safety and well-being	0.56	0.60	0.52	0.70	0.62
Cost estimation, prediction, planning, and control	0.61	0.58	0.56	0.65	0.57
Incorporating environmental, social and governance (ESG) principles	0.49	0.53	0.49	0.61	0.56
Implementing whole-of-life and whole-of-asset thinking	0.49	0.53	0.46	0.58	0.51
Designing and measuring social value	0.45	0.52	0.45	0.58	0.52
Carbon footprint calculation, benchmarking and reporting	0.46	0.49	0.47	0.54	0.53

Table 2: RII ranking of use by global region

Figure 4 and Table 3 show the gap in adoption levels across the 2021, 2022 and 2023 surveys. Although the changes from the prior years are small, the overall trend does show a consistent increase in those with high usage ('all projects' and 'most projects').

The data indicates that a digital divide is emerging, with two camps: adopters and non-adopters. These results point to the following challenges and opportunities for the sector.

Challenges

- 1 Areas like whole-of-life thinking and carbon footprint calculations show stagnant adoption rates. This suggests barriers to adoption that include complexity, lack of training or integration challenges.
- 2 ESG and social value have the lowest adoption rates, reflecting a gap between their importance and the available tools or frameworks for implementation.
- 3 Designing social value may lack effective digital solutions. There is a need for real-time tools that are easy to integrate into workflows.

Opportunities

- 1 The increasing global focus on sustainability offers growth potential in carbon reporting and ESG adoption, aligning with regulatory trends and offering competitive advantages.
- 2 Social value has untapped potential. Standardising metrics and demonstrating benefits can drive wider adoption, especially for companies focused on ESG.
- 3 Easier, more accessible tools, combined with education and a clear return on investment could boost adoption in areas like carbon calculations, ESG and social value.

Use on most and all projects versus none of our projects

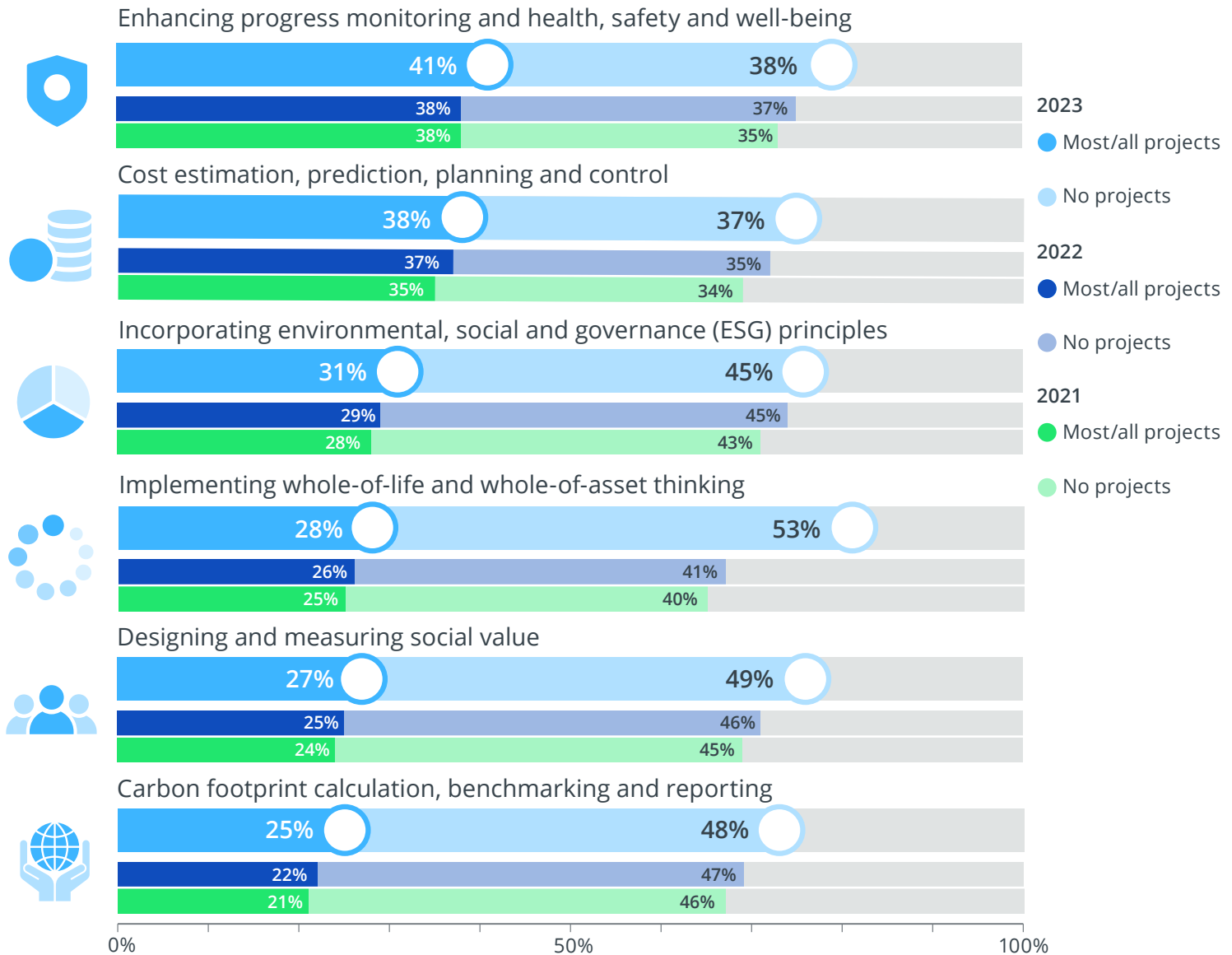


Figure 4: Use on most or all projects versus no projects

Uses	Gap between high and no usage (%)		
	2024 (Q4 2023 survey)	2023 (Q4 2022 survey)	2022 (Q4 2021 survey)
Enhancing progress monitoring and health, safety and well-being	3	1	3
Cost estimation, prediction, planning and control	1	2	1
Incorporating environmental, social and governance (ESG) principles	-14	-16	-15
Implementing whole-life and whole-asset thinking	-25	-15	-15
Designing and measuring social value	-22	-21	-21
Carbon footprint calculation, benchmarking and reporting	-23	-25	-25

Table 3: Gap in usage

3 Improvements driven by digitalisation

Figure 5 shows a decrease in the percentage of respondents answering with 'strongly disagree' and 'disagree' between the 2023 and 2022 surveys across the six functions. Responses in 2023 ranged from 7% to 11% compared with 8% to 13% in 2022. The results generally align with the rankings of these six functions regarding levels of use, indicating a correlation between perceived benefits and adoption.

Processes and practices driven by digitalisation help or are likely to help my organisation improve (global responses)

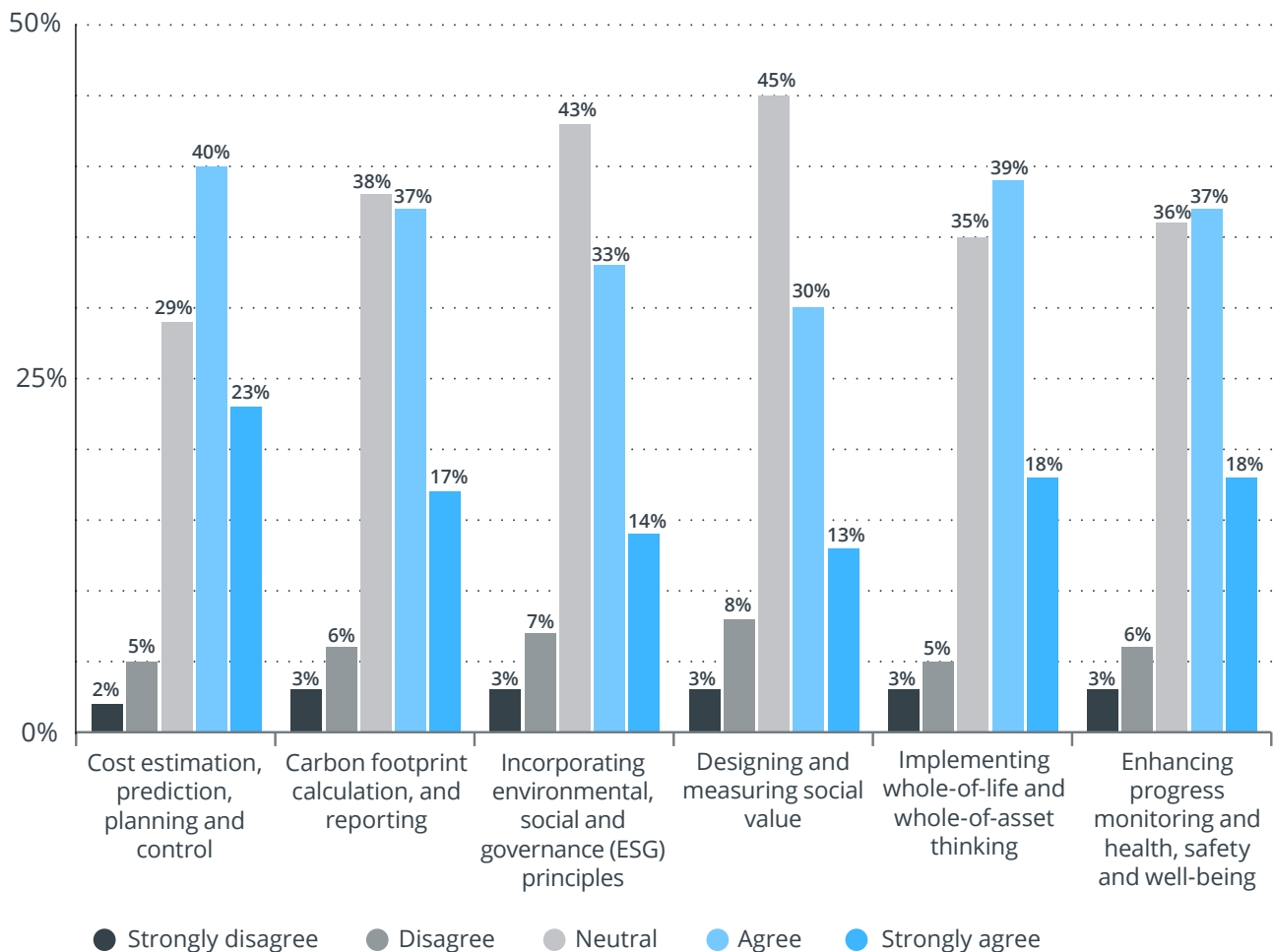


Figure 5: Responses to perceived improvements driven by digital processes and practices

Across regions, a broadly consistent picture is seen when considering improvements from digitalisation. Of the six regions, MEA respondents continue to report the most favourable realisation of improvements, with the UK and Ireland once again having the least positive perception of outcomes (Figure 6).

Benefits of digitalisation to my organisation

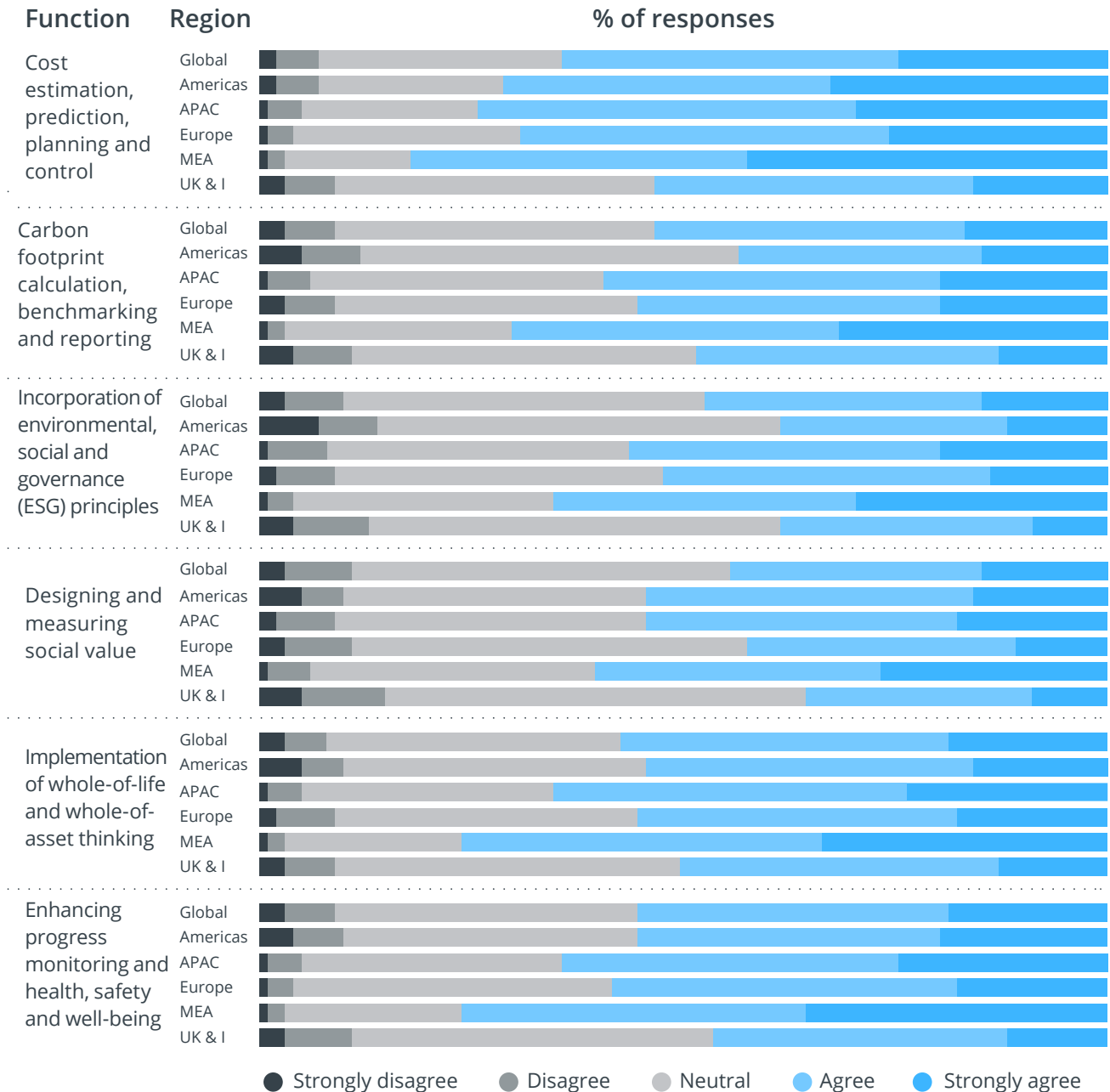


Figure 6: Perceptions of improvements by function and region

In 2022, every function showed a drop in overall perceived improvements, with a 6-point decrease in the 'cost estimation, prediction, planning and control' function. As shown in Figure 7, the 2023 survey shows a recovery across all the functions, albeit not fully back to the levels reported in 2021.

Improvements (strongly agree and agree)

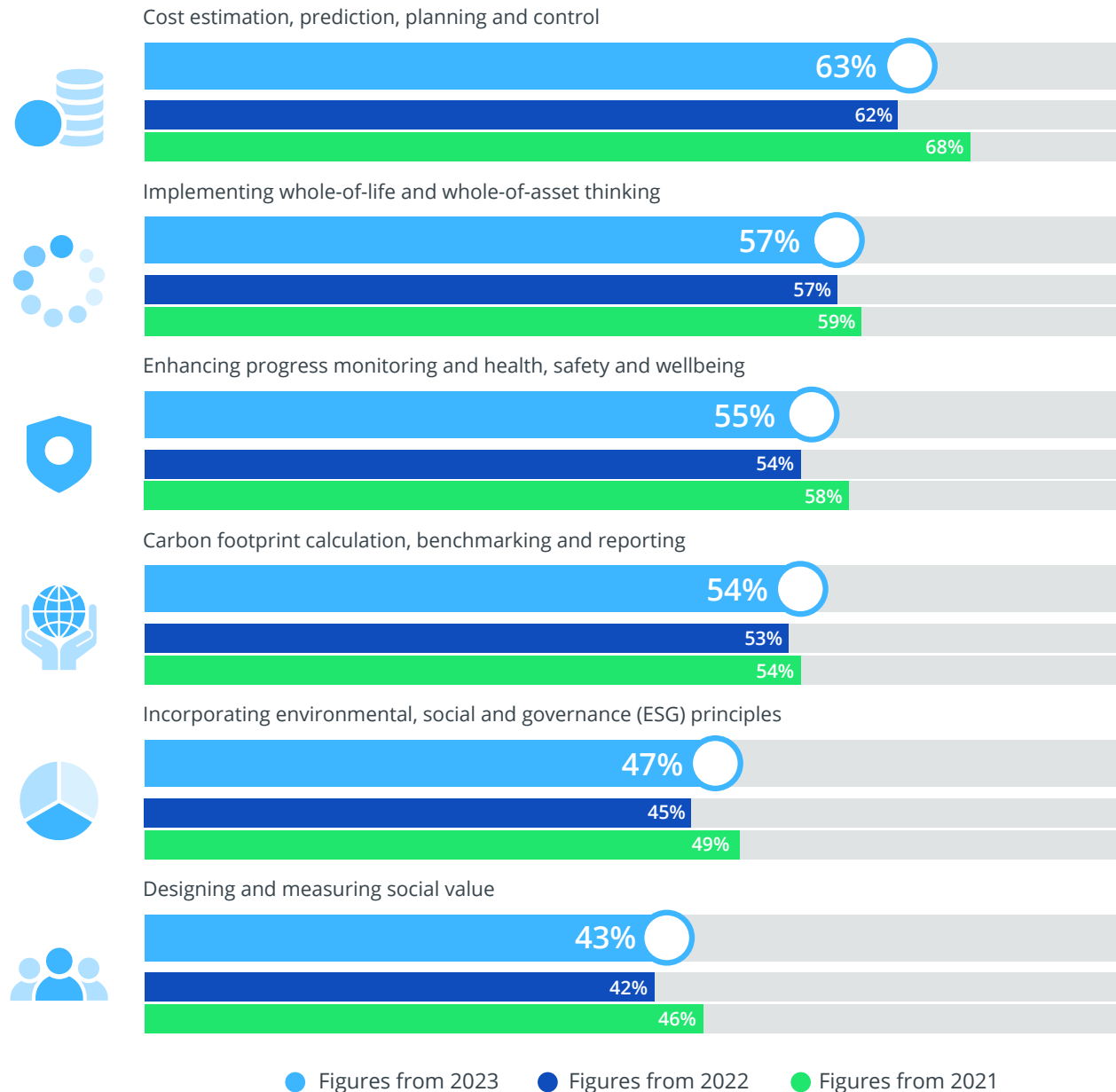


Figure 7: Ranked improvements in functions driven by digitalisation

Table 4 shows the positive bias toward agreement on the improvements associated with digitalisation. Respondents viewed digital tools as benefitting the six functions, with a positive bias ranging from 9% to 21% (compared to 8% to 21% in 2021). Of the six functions, 'cost estimation, prediction, planning and control' once again showed the highest positive bias.

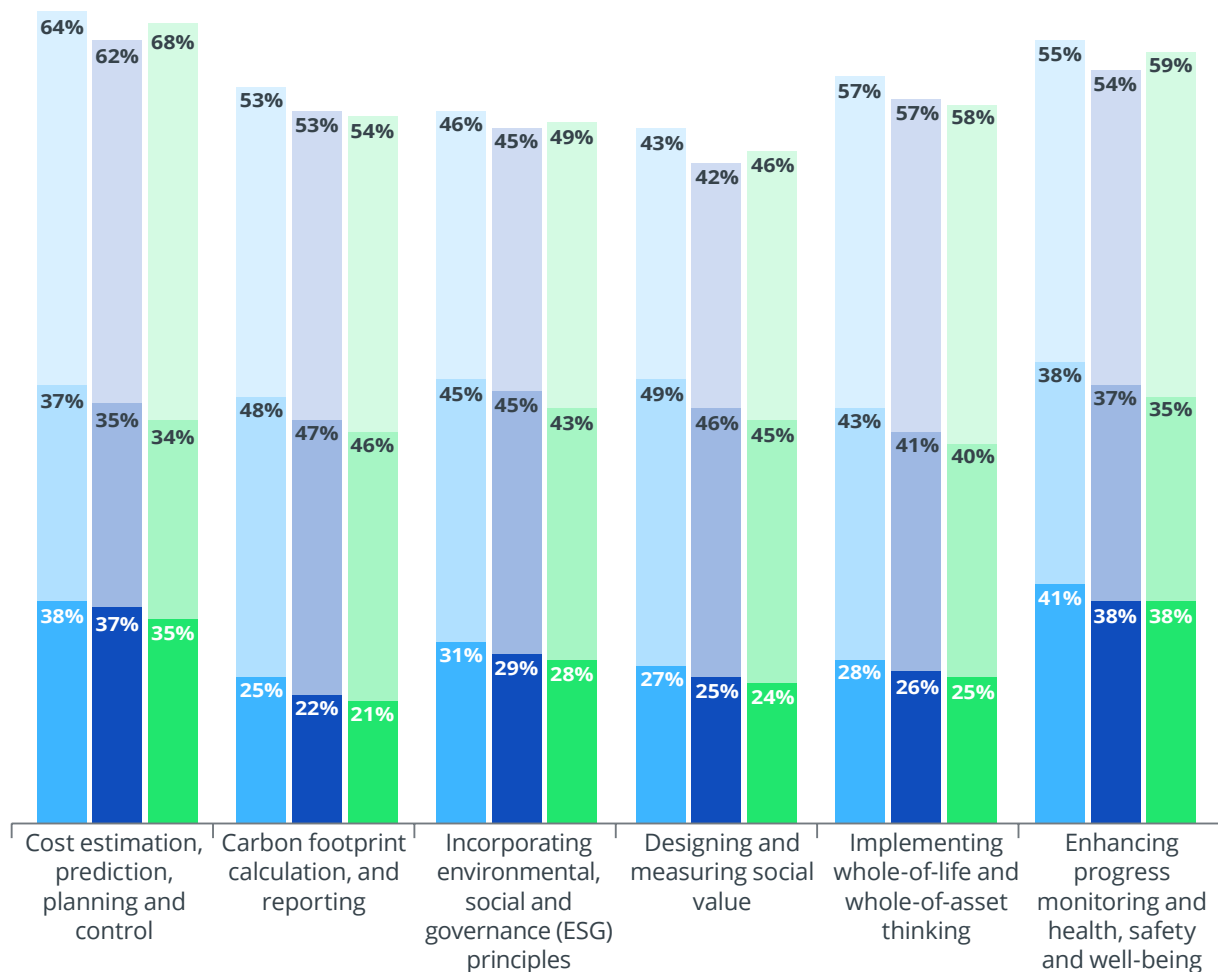
	Positive bias towards agreement (strongly agree minus strongly disagree)			Comparison of ranking by usage and improvement					
	2024 (Q4 2023 survey)	2023 (Q4 2022 survey)	2022 (Q4 2021 survey)	2024 (Q4 2023 survey)		2023 (Q4 2022 survey)		2022 (Q4 2021 survey)	
				Usage ranking	Improvement ranking	Usage ranking	Improvement ranking	Usage ranking	Improvement ranking
Cost estimation, prediction, planning and control	21%	21%	23%	2	1	2	1	2	1
Enhancing progress monitoring and health, safety and well-being	16%	14%	17%	1	3	1	3	1	2
Implementing whole-life and whole-asset thinking	15%	14%	16%	4	2	4	2	4	3
Carbon footprint calculation, benchmarking and reporting	14%	13%	14%	6	4	6	4	6	4
Incorporating environmental, social and governance (ESG) principles	11%	10	12%	3	5	3	5	3	5
Designing and measuring social value	9%	8%	11%	5	6	5	6	5	6

Table 4: Difference between strong agreement and strong disagreement in responses related to improvements

4 Improvement versus adoption

When we look at the gap between adoption (use in most/all projects) and favourable views of digitalisation (improvements), we see a considerable difference (or 'pull factor' – difference between perceived improvements and use of functions) to drive more adoption across all process and practice areas.

Consistent use of processes and practices driven by digitalisation versus improvements resulting from digitalisation



Figures from 2023 ● Use most/all projects ● Use none of our projects ● Improvements (strongly agree and agree)
 Figures from 2022 ● Use most/all projects ● Use none of our projects ● Improvements (strongly agree and agree)
 Figures from 2021 ● Use most/all projects ● Use none of our projects ● Improvements (strongly agree and agree)

Figure 8: Level of use versus perception of improvements

The more established functions of 'cost estimation, prediction, planning and control' and 'enhancing progress monitoring and health, safety and well-being' show a significant gap between adoption and perceived value. The gap, and therefore 'pull', for 'carbon footprint calculation, benchmarking and reporting' while remaining broadly static gives us a degree of optimism that this area will see greater adoption soon.

The third additional question in the 2023 GCM asked respondents to rank nine blockers using a high, medium and low scale. Figure 9 provides a ranked listing of these blockers compared across all three surveys.

The results show 'cost, effort and changes needed' is still the highest-ranked blocker (53%) and 'recent graduates not equipped with the right digital capabilities' remains the lowest-ranked blocker (24% of respondents).

'Cost, effort, and changes needed' remains the highest-ranked blocker because implementing digital tools in construction requires significant investment and disruption to established processes, which firms may hesitate to undertake.

This is changing as digital technologies become more affordable and firms recognise the long-term benefits, potentially reducing the emphasis on cost and effort as primary blockers.

Blockers you think hinder digitalisation of design and construction processes and practices

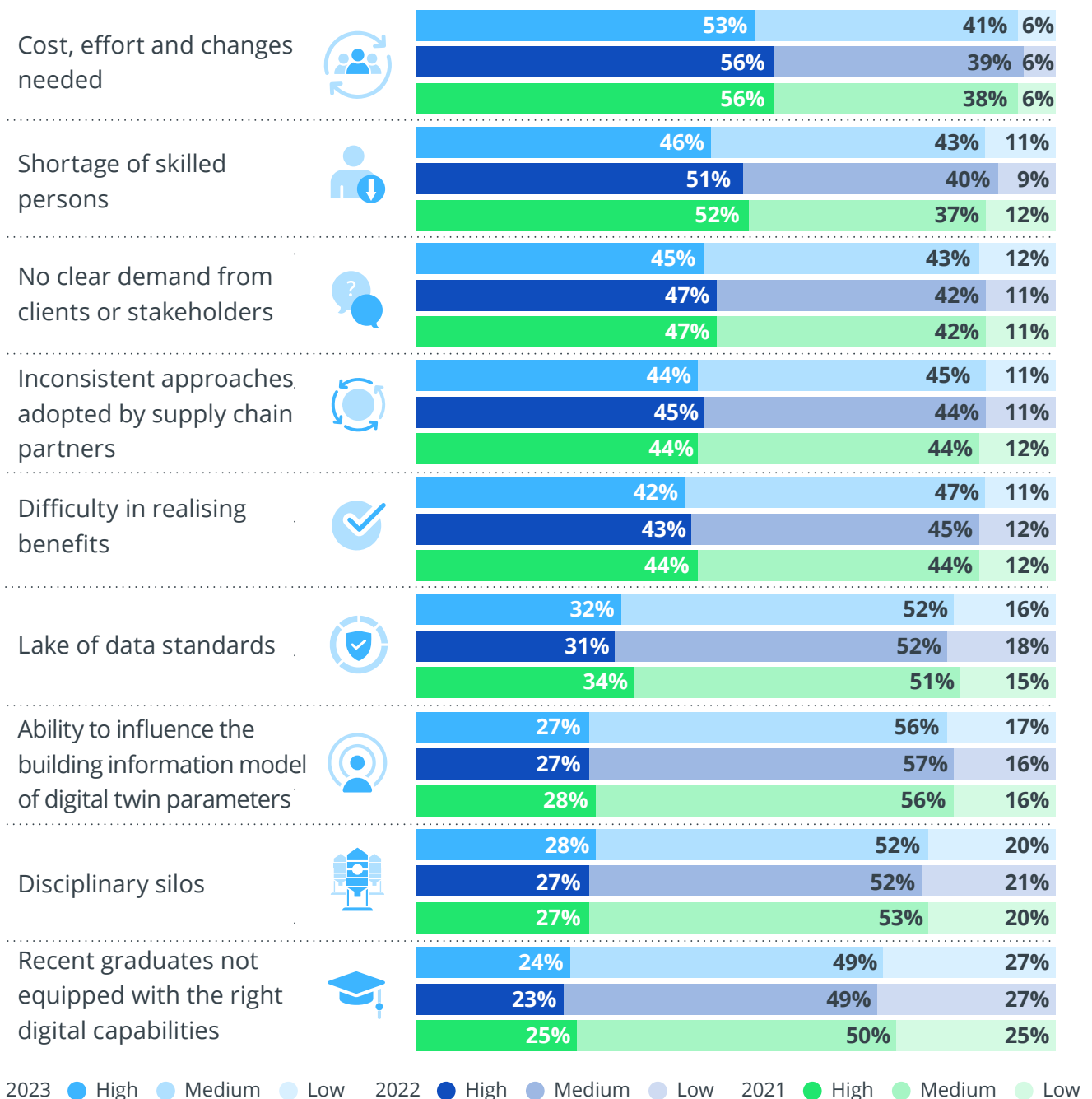


Figure 9: Blockers by function

There remains a significant issue with the realisation of improvements, which is probably compounded by the fragmented nature of the construction sector and the continued challenge presented by using unstandardised data.

Figure 10 shows the regional responses for the top three blockers. Regional variations do not seem to be significant, although APAC in general reports lower levels than the other regions.

Blockers you think hinder digitalisation of design and construction processes and practices

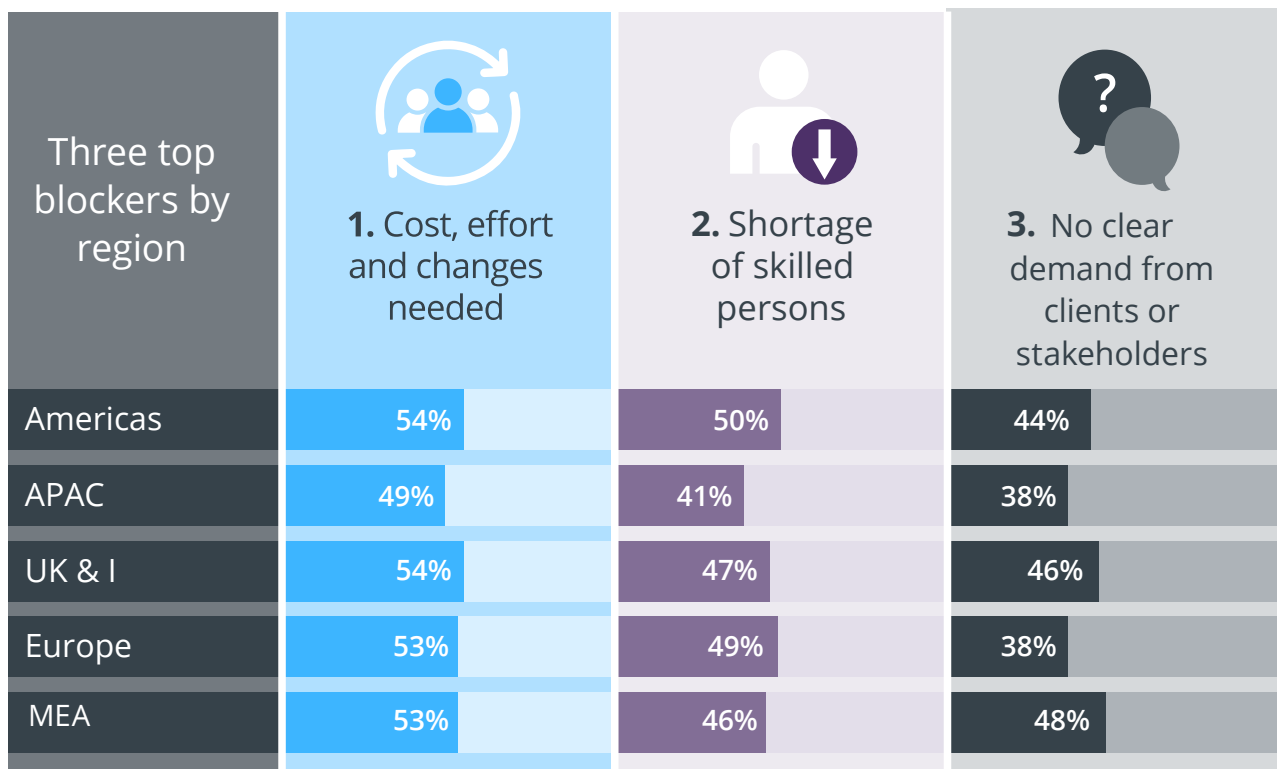


Figure 10: Top three blockers by region, based on the percentage of respondents who ranked them 'high'

5 Data and information sharing

Higher levels of digital adoption by project teams should result in enhanced information exchange. While this overall exchange of information is dependent on several factors – such as interoperability, contractual arrangements, and information management processes – an argument can be made that some improvement can be attributed to the greater use of digital technologies.

To assess progress in this area over time, respondents were asked to provide their views on the degree of data and information sharing with other project team members ('provide and receive', 'provide only', 'receive only' or 'none') about materials, products and systems via digital models in their current projects.

Figure 11 shows regional responses ordered by global RII value, indicating the highest data and information sharing level for 'quantity take-off and cost estimating' and the lowest level for 'life cycle carbon emissions'.

Data and information sharing by function using digital models (arranged low to high based on Relative Importance Index (RII))

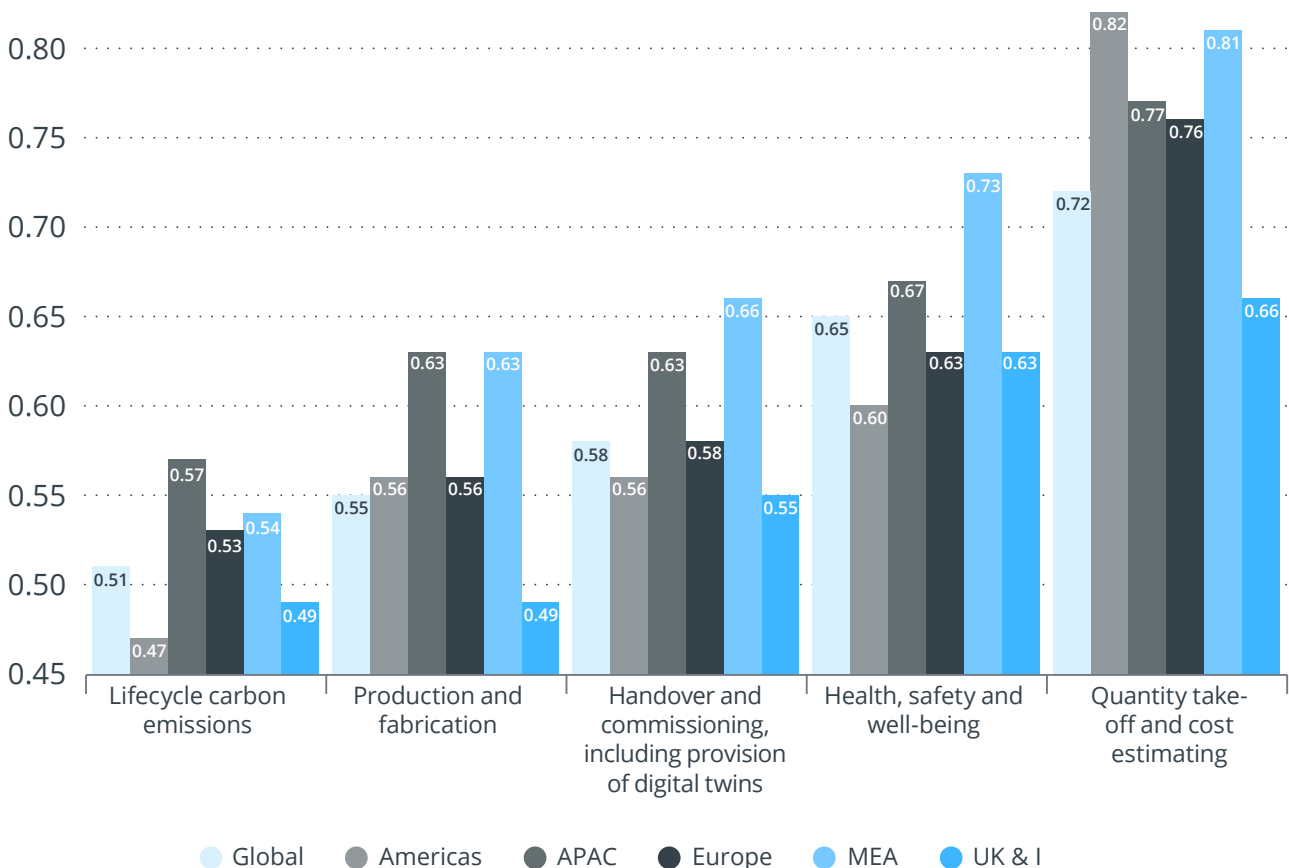


Figure 11: Regional ranking of data sharing by function

Data and information sharing by function via digital models by region

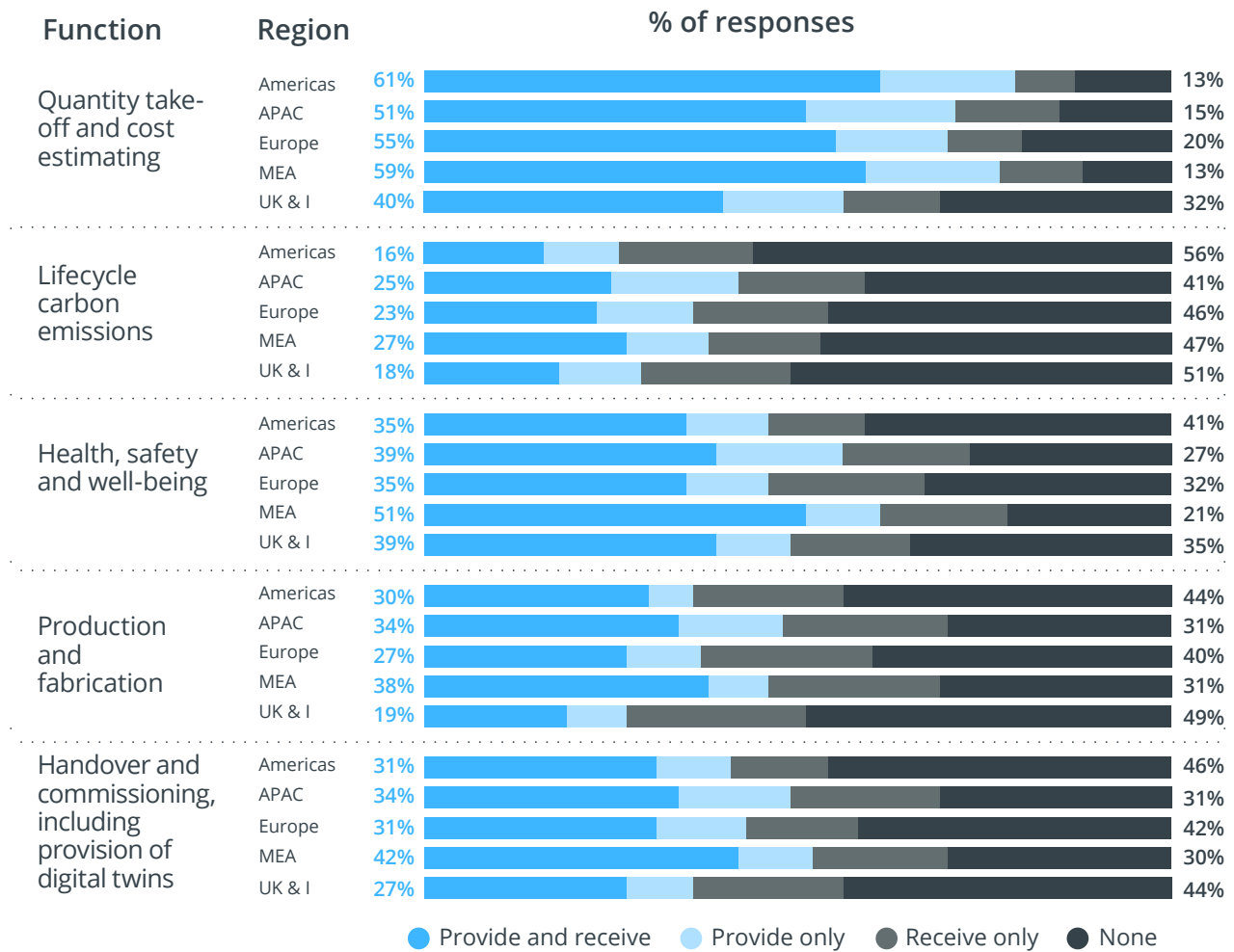


Figure 12: Data and information sharing by function and by region

Looking at the number of survey respondents in total (without separating by or averaging across global region) approximately 48% of global respondents (compared to 46% in the 2022 and 2021 surveys) reported that they provide and receive data and information via digital models for the core function of 'quantity take-off and cost estimating'.

Of the total number of respondents to the survey, 24% of respondents also said they do not share data and information for this function compared to 25% in 2022 and 24% in 2021. The UK and Ireland continue to show the lowest level of information exchange (see Figure 13).

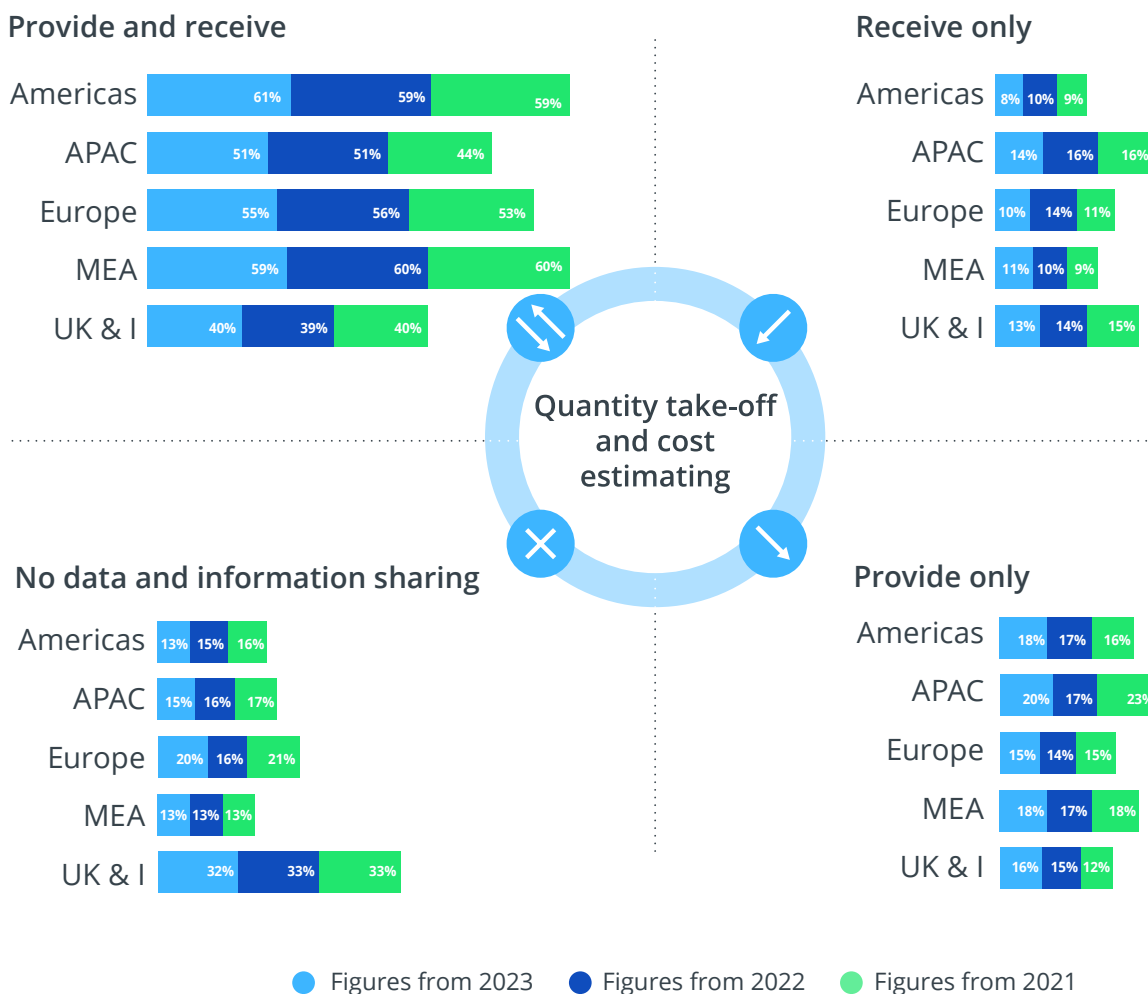


Figure 13: Data sharing for quantity take-off and cost estimating

Figure 14 shows the sharing of data and information for measuring and reporting 'life cycle carbon emissions'. In line with the overall low level of digital adoption around carbon calculations, approximately 21% of all survey respondents, regardless of region (compared to 20% in 2022 and 18% in 2021) share data and information in both directions for this function.

Just under half (49%) of all respondents stated they do not share data and information about 'life cycle carbon emissions' in any form, compared to 50% in 2022 and 52% in 2021. This shows steady, albeit slow, progress.

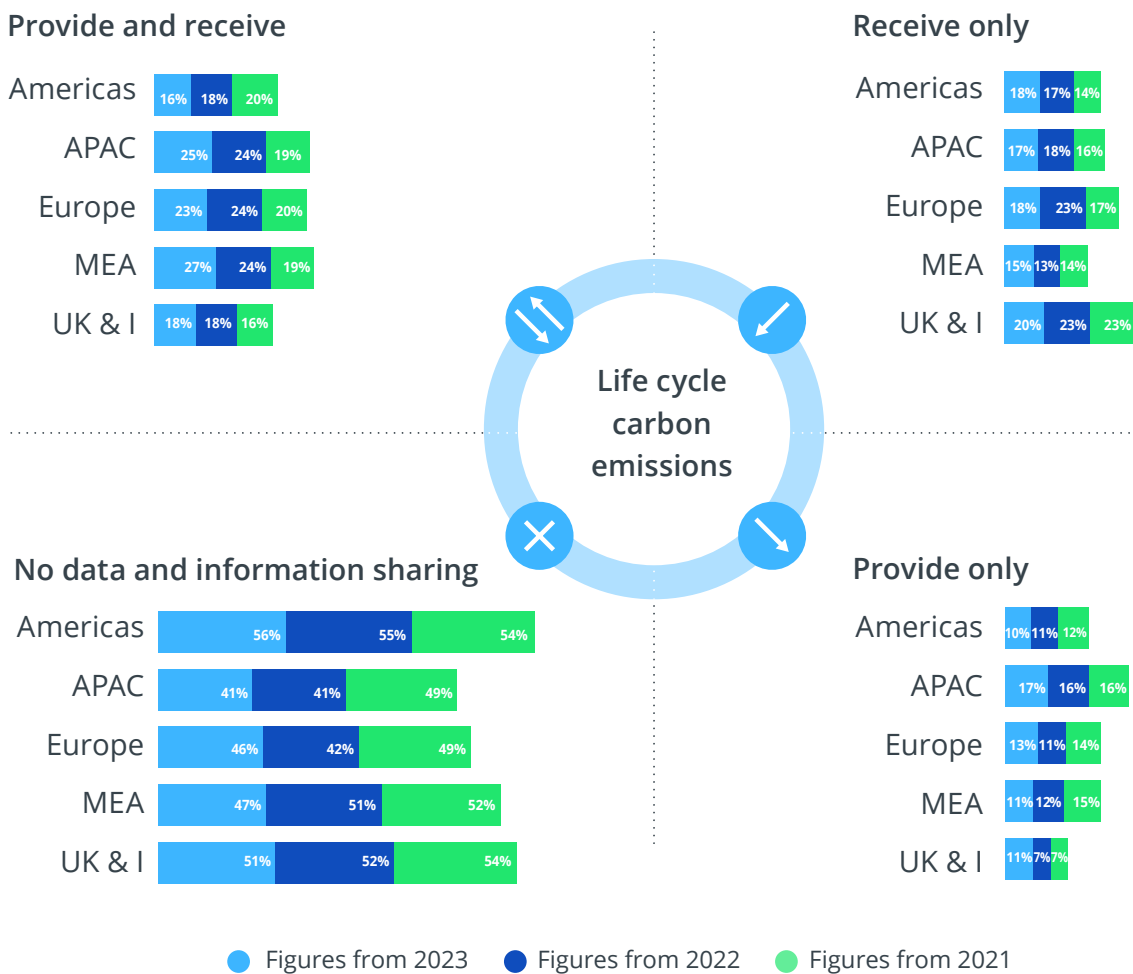
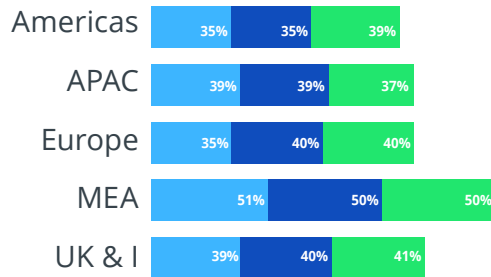


Figure 14: Data sharing for life cycle carbon emissions

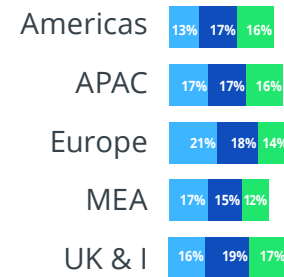
The picture for 'health, safety and well-being' is broadly like 'quantity take-off and cost estimating', with no significant change seen from the Q4 2022 and Q4 2021 surveys (see Figure 15).

For this function, MEA remains an outlier, with a high level of data and information sharing reported.

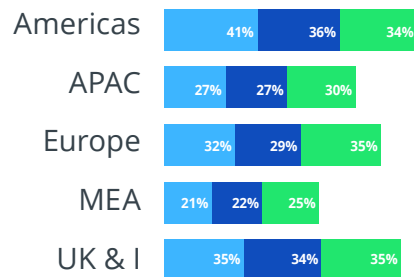
Provide and receive



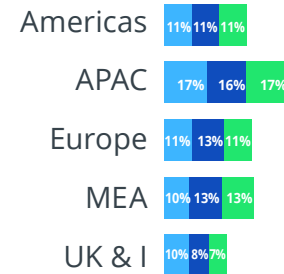
Receive only



No data and information sharing



Provide only



● Figures from 2023 ● Figures from 2022 ● Figures from 2021

Figure 15: Data sharing for health, safety, and well-being

Approximately a quarter (26%) of total respondents to the survey, regardless of region, (compared with 26% in 2022 and 25% in 2021) stated they both provide and receive data and information on 'production and fabrication'.

The UK&I once again shows a disappointing result, with 49% of respondents stating they are not sharing data at all (see Figure 16). Looking at the total number of respondents globally, those stating they are not sharing data and information has increased to 42% in 2023, from 41% in 2022 and 40% in 2021.

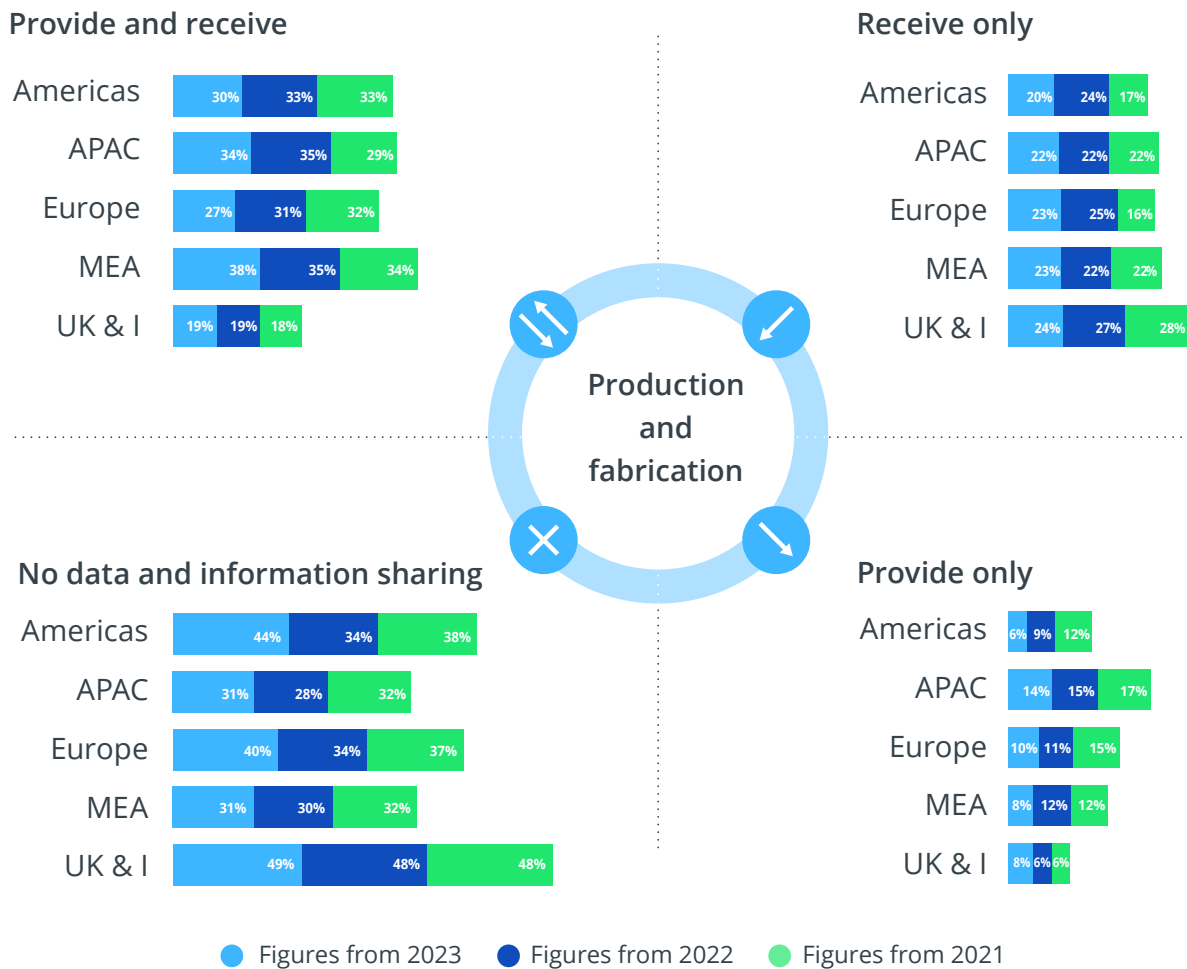


Figure 16: Data sharing for production and fabrication

The final question for data and information sharing on 'handover and commissioning, including provisioning of digital twins' is particularly important because it is connected to whole-life and whole-asset thinking. It also supports successful soft landings, where a new or refurbished asset is handed over to the operation phase of the asset life cycle. For BIM to deliver on the promise of 6D (facilities management) and 7D (sustainability) over the asset's entire life cycle, data transfer into a digital twin is an important precondition for success.

Figure 17 shows the state of data and information sharing for handover and commissioning, including the provisioning of digital twins. The UK&I appears once again to be a negative outlier, albeit with the highest score for receiving data (same as in APAC). This might reflect respondents who are responsible for the operation phase receiving data on handover, with the UK government's 'Soft Landings' policy driving adoption in this regard.

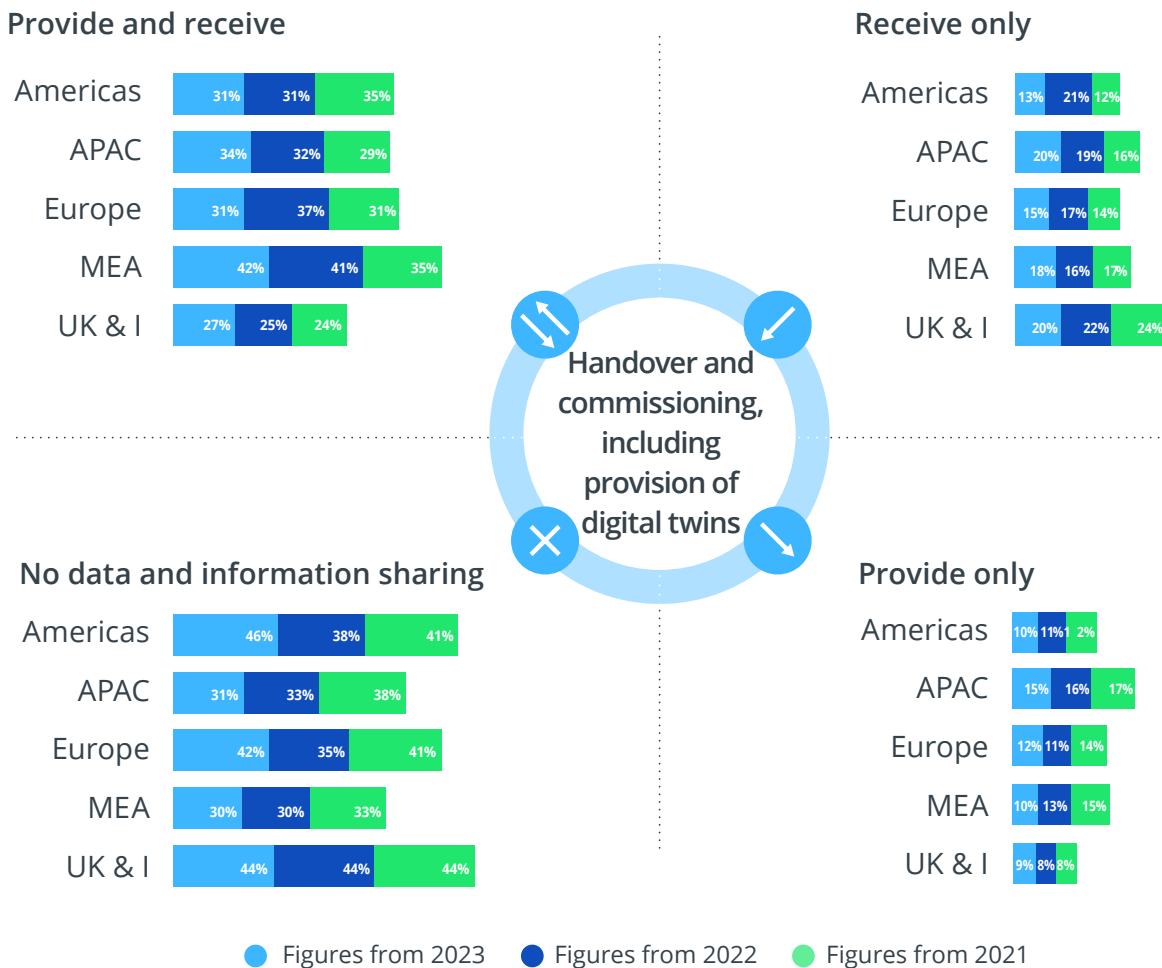


Figure 17: Data sharing for handover and commissioning

6 Conclusions

The overall uptake of digital tools has not shown marked progress over the last three years. The 2023 survey responses indicate that digital technology is predominantly used to support established practices such as cost estimation, forecasting, planning, management, and improving progress tracking, health, safety and well-being. Conversely, domains like environmental, social and governance (ESG) criteria, comprehensive life cycle and asset management, social value and carbon tracking are witnessing limited engagement.

Digital tools and data sharing play a critical role in constructing and retrofitting buildings and infrastructure that deliver social value, support the net-zero agenda, and provide value for money. The 2023 survey responses align with the [2023 RICS Sustainability report](#) findings, showing that environmental and sustainability issues are beginning to influence the industry, with significant implementation gaps remaining. Regulatory pressures, macroeconomic factors, political shifts, and heightened climate change awareness should continue to drive the adoption of digital processes, yet the data indicates slow and stagnating progress in these areas.

To address social, environmental and economic challenges, construction practitioners are being asked to produce detailed and newer outputs such as life cycle costs, whole-life carbon assessments, scope 3 emissions, retrofit pathways, measuring circularity of built assets, and end-of-life studies for assets. Producing these outputs is tedious without access to structured and unstructured data and relying on model-centric and data-driven workflows.

Therefore, monitoring and measuring the industry's progress in digitalisation is vital. RICS plans to continue these surveys to track industry advancements.

The findings from the 2023 survey also reflect ongoing sentiment about the benefits derived from digital technology. Survey participants emphasised that the greatest enhancements were seen in 'cost estimation, forecasting, planning, and management', along with 'progress tracking and promoting health, safety, and well-being'. Interestingly, 'carbon footprint assessment, standardisation, and disclosure' was identified as the fourth most improved area despite being ranked sixth in terms of present-day digital applications for this function.

Analysis of responses to the question on 'sharing data and information with other project team members regarding materials, products, and systems via digital models' indicates no significant changes over the surveyed period. Data sharing remains consistently higher in established functions such as 'quantity take-off and cost estimating' and 'health, safety, and well-being.' However, the level of data sharing for sustainability-related functions continues to lag.

Geographically, the UK remains a negative outlier in three out of five process and practice areas. This could be partially attributed to the higher volume of responses from the UK skewing the results. Conversely, both APAC and Europe experienced a decline in response rates compared to the 2021 survey. This reduction may introduce a bias towards more advanced users in digitalisation, potentially influencing the overall findings.

Advancements in digital tools and technologies have come on both the supply and demand sides. AI and improvements in data analytics have become more available. At the same time, professional services are now expected to deliver outputs that extend beyond traditional metrics of time, cost and quality to include social and environmental indicators.

These developments underpin a renewed imperative for the sector to enhance data sharing, streamline information management, and accelerate the adoption of digital tools. The previous two reports emphasised the importance of information management processes in driving the adoption of digital technology for carbon measurement, ESG, and whole-life and whole-asset approaches.

6.1 Whole-life carbon assessment for decarbonising the built environment

Globally, over half of respondents (54% in 2023, 53% in 2022 and 54% in 2021) agreed that whole-life carbon assessment benefits from the use of digital tools. However, an almost equal proportion of respondents report not using digital tools to measure carbon emissions on their projects (48% in 2023, 47% in 2022 and 46% in 2021).

This sentiment aligns with the [2023 RICS Sustainability report](#) findings, where around half of the respondents globally state they make no measurement of embodied carbon on their projects.

Reflecting those segments of construction where practices around carbon assessment are being adopted is the recent increase in uptake of professional standards and tools.

These include the latest version of RICS' [Whole life carbon assessment for the built environment standard](#) (designed to consistently and comprehensively calculate whole-life carbon emissions from projects and assets) and the [International Cost Management Standard](#) (ICMS) (designed to integrate the recording, analysis, presentation, and comparison of life cycle costs and carbon emissions of projects and assets). With the support of the [RICS Data Standard](#), the [Built Environment Carbon Database](#), and other RICS offerings, the combination of consistent and structured data and digital tools will strengthen this integration.

Fundamental to decarbonisation is the availability of good quality primary or foreground data (data about the project or asset under consideration, e.g. material quantities, energy and water use, etc.) and secondary or background data (carbon factors data, e.g. Environmental Product Declarations (EPDs), and other carbon conversion factors). Construction and quantity surveying professionals already play a significant role in providing the primary data, but there is a need to increase the availability of secondary data. Data and information sharing about materials, products, and systems should also be increased, electronically, so that cost and carbon calculation workflows can be integrated with the core design, construction, and post-construction workflows. For example, the industry needs to come together to streamline the availability of EPDs in a shareable, interoperable and machine-readable format across the entire value chain. The infrastructure for this already exists, but implementation challenges remain.

6.2 Promoting life cycle approach

Digitalisation will be pivotal in advancing a life cycle approach, necessitating the industry's adoption of value-driven procurement and stronger collaboration throughout the asset life cycle. According to the 2023 survey, 43% of respondents reported not using digital tools to support this function, while 57% acknowledged that digital tools could potentially promote a life cycle approach. This use of data-driven approaches, combining the [International Building Operation Standard](#) (IBOS) with ICMS to measure and manage how built assets perform, will drive adoption and benefit realisation, and demonstrate clear returns on investment.

As described in the [Future of BIM: Digital transformation in the UK construction and infrastructure sector](#) and [Digital twins from design to handover of constructed assets](#) reports, integrating BIM and digital twins will support the implementation of whole-life and whole-asset thinking for both new and retrofitted assets.

6.3 Incorporating ESG principles

Only 11% of respondents (unchanged from the 2022 and 2021 surveys) reported using digital tools to incorporate ESG on all their projects. Conversely, 54% of respondents (compared to 45% in 2022 and 49% in 2021) strongly agree or agree that the use of digital tools can improve ESG outcomes. The results show an increasing industry recognition of the benefits digital tools can bring to incorporating ESG on their projects that is not reflected in action.

Data collection, collation, and reporting on ESG can be greatly helped by using digital tools, especially given many measurement and reporting frameworks available today. By using digital tools, ESG principles can be integrated into asset design, construction, management and end-of-life. To support the use of data in ESG, RICS released the [ESG data list for real estate valuations](#).

6.4 Overcoming the blockers

The recurring identification of the same blockers in the 2021, 2022 and 2023 surveys underscores entrenched issues within the sector. In the [RICS Construction productivity report 2023](#), respondents ranked 'greater investment in data and digitisation' as the second most important intervention to increase productivity. Addressing these challenges will require a joint effort from industry, government and academia. RICS members and their firms are pivotal in driving the adoption of data-driven digital workflows.

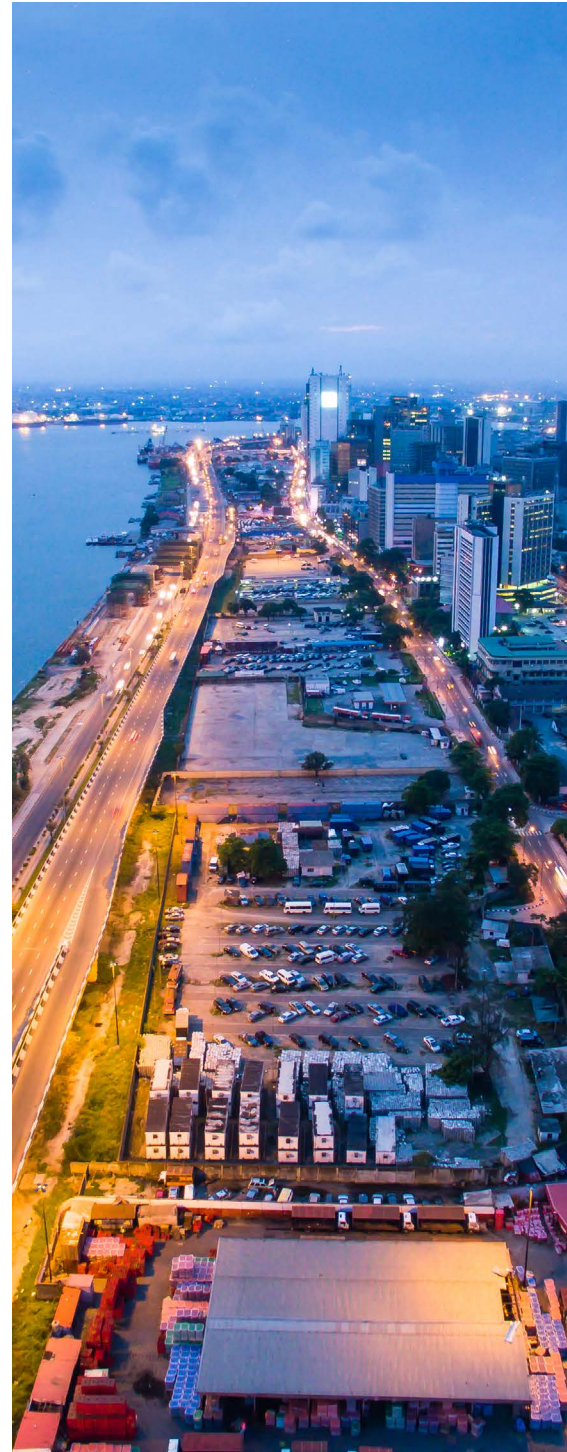
The [Tech Partner Programme](#), which gained momentum in 2023, now functions as a collaborative hub where technology providers and end users can work together to resolve these adoption obstacles.

7 Recommendations

RICS advocates a holistic approach to the adoption of digital tools and technologies in construction. Data-driven industry practices that utilise effective information management, are integrated across project phases, support continuous skill development and that incorporate life cycle thinking, the careful evaluation of technologies and the ethical adoption of AI will ultimately lead to more equitable and sustainable outcomes.

RICS recommends the following high-level measures to accelerate the adoption of digital tools and technologies in construction.

- Implementing data-driven processes and systems to achieve social, environmental and economic outcomes in projects and built assets.
- Emphasising effective information management practices to support these data-driven approaches.
- Leveraging digitalisation to enhance integration across disciplines, project and asset phases, and between multiple projects and assets.
- Investing in skill development for diverse talent.
- Encouraging a comprehensive perspective considering the entire life cycle of assets and projects.
- Carefully evaluating use cases and conducting cost-benefit analyses before adopting and adapting digital technologies.
- Keeping up with AI and data analytics while balancing adoption with security, privacy and ethics.



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