



AUTODESK
CONSTRUCTION
CLOUD™

Benchmarking Construction Industry Workflows

Australia and
New Zealand



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Introduction:

Measuring Excellence and Improving Performance

Many companies use key performance indicators (KPIs) to gauge and compare performance in meeting both strategic and operational goals. The construction industry as a whole, however, lacks objective benchmarks or ways to measure excellence across the industry.

This eBook aims to outline simple KPIs that companies of all sizes can start capturing today by using technology that digitises this information, delivering shared access to critical project documentation and data to help project teams collaborate. Comprehensive analysis of this data across our industry will help improve processes, and lead to better performance and project delivery.

Gaining insights from data

One reason for the absence of industry benchmarks is the lack of centralised data necessary to establish standards. All contractors who use digital technology to manage their construction projects are generating data and information. Many say, however, they lack a single place to aggregate that information and don't know how to use it in a meaningful way.

Being able to analyse data such as project information around requests for information (RFIs) and change orders not only provides useful context, but also enables contractors to understand patterns of issues in their building processes.

Drawing on industry expertise

Autodesk commissioned a study with Dodge Data & Analytics and Censuswide to survey more than 200 head contractors and subcontractors in Australia and New Zealand to identify and analyse current processes for project planning and execution. The study revealed seven KPIs that companies say are especially useful when it comes to interpreting overall performance.

The findings suggest that by adopting specific processes for project management, contractors can reduce risk, thereby minimising downstream problems and improving performance.

The report covers seven categories of project activities, including:

- Problems discovered in construction documents
- RFIs
- Change orders
- Project schedules
- Safety/inspections
- Labour productivity
- Quality and close out

Read the key findings and see how your company measures up.

7 Key Processes of Construction

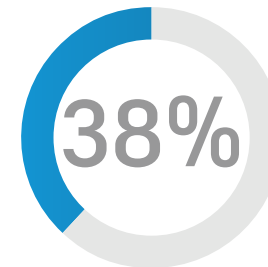
1. Problems found in construction documents

Errors at the tender phase of construction documents can ripple through a project. Seeing the issues that arise, and comparing them with similar previous projects, can enable contractors to work to avoid the same problems in future.

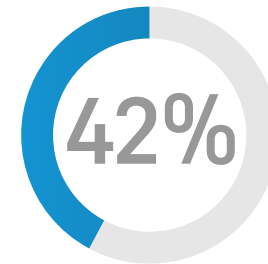
At Autodesk, we wanted to understand how many contractors capture information about errors, omissions and constructability issues at the outset, how often they do so, how hard they find this work and how valuable they perceive it to be. Additionally, we also asked about reporting and risk reduction in their projects.

Notable Statistics

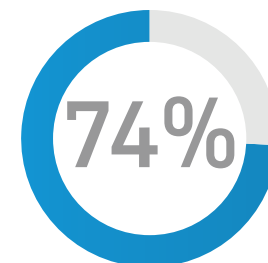
- **Subcontractors are markedly less likely to capture errors**, omissions and constructability issues frequently*, with only 24% doing so, compared with 46% of head contractors.
- While it's important to capture issues on current projects, it's equally critical to set up standard processes to compare them to past projects. It's not habitual now, however. Of all respondents who capture issues frequently, only **42% regularly compare them to past projects**. Half of head contractors do so, while only 27% of subcontractors do.
- Likewise, only about two in five of those who look for errors frequently report issues to senior management or see proactive risk reduction as a result.
- Those who track the data find it useful: **84% of those polled who find errors in tender documents say it's valuable or highly valuable**. Across the board, however, it's still seen as a challenge with 48% of all respondents saying it is difficult or very difficult to do. **For head contractors, the time and expense involved is the biggest obstacle, while lack of senior management support is the challenge most cited by project owners.**



38% of respondents frequently capture errors, omissions and constructability issues discovered during the tender phase of construction documents.



42% frequently compare errors, omissions and constructability issues in construction documents to past projects.



74% say it would be valuable or highly valuable if they could capture issues more frequently

*Frequently = on over 50% of their projects

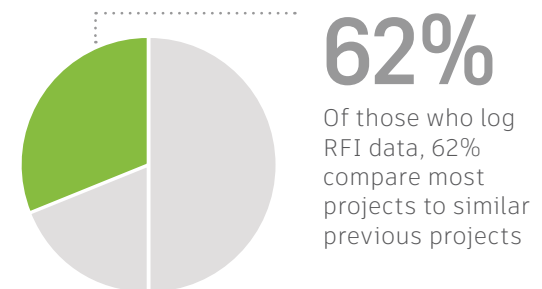
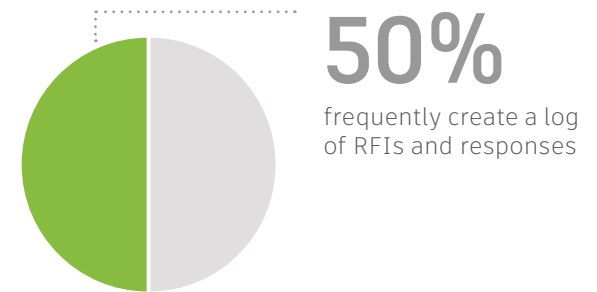


2. Logging RFIs and responses

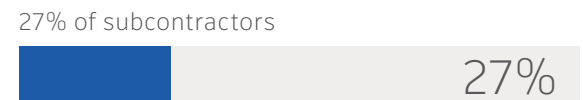
Requests for information (RFIs) and responses are another point in the project process where errors can occur, so we sought to determine how often those surveyed log RFIs and responses. We also asked how often those who create such a log compare it to previous similar projects and use it to proactively reduce risk.

Notable Statistics

- Half of respondents told us they log RFIs and responses on most of their projects. It's seen as a tough job, however, with two thirds of all those polled saying it's difficult to do.
- 70% of those who log RFIs are likely to report them to senior management as potential sources of risk, but subcontractors are more likely to say they do so than head contractors, presumably reflecting the reporting hierarchy.
- Of all those surveyed who create a log of RFIs and responses, 85% say it is a valuable thing to do.
- Contractors who don't log RFIs and responses digitally see the value in it. They find, however, that obstacles such as the potential time and cost involved or resistance from others (including senior management) inhibit them from putting in place the necessary technology and processes.
- By using historical data to identify the root cause of the RFI and measuring the time to receive a response, contractors can see where potential breakdowns can happen in communication between teams. This helps them to implement more efficient practices on future projects.



Logging RFIs on most projects

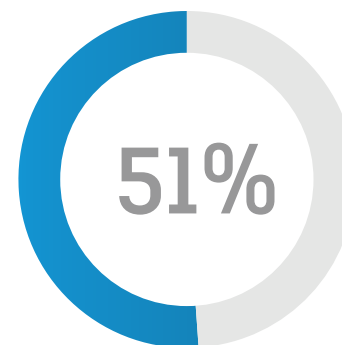


3. Documenting change orders

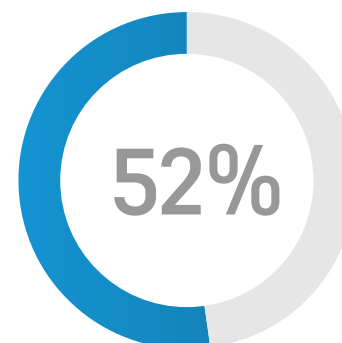
When the original project contract or schedule gets amended, it can cause delays and additional costs. We asked how often respondents collect and document change orders, including turnaround times, root causes and schedule impact.

Notable Statistics

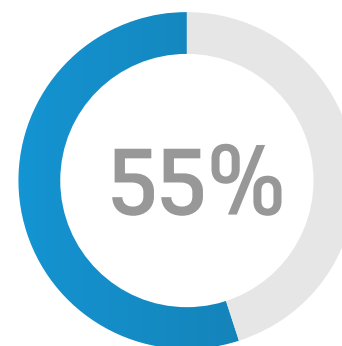
- 56% of respondents typically collect and document change orders on over half of their projects, with head contractors much more likely to capture this information -- at 65% -- than subcontractors (41%).
 - This trend continues when we examine how often those surveyed capture turnaround times, root cause and schedule impact, with head contractors markedly more likely to track these factors. It's possible that if they have change order logs, some subcontractors may not see the need to keep one of their own.
 - Analysing data from change orders can help head contractors assess issues on projects and how to do things differently in future. What was the root cause of the change order? How long did it take them to turn it around?
- **What's holding people back?** Survey respondents told us investing in processes to better capture and document change orders can be both too time-consuming and too expensive. Furthermore, they can meet resistance from others or find senior managers that don't support their efforts.
- Despite the potential cost implications and other challenges that may arise, it's worth pushing to document issues with change orders. Of those project owners and clients who do it, 85% say it's valuable to the overall project delivery process. Subcontractors are somewhat less likely to see the value in it, however, so sharing information more widely about the benefits of doing this could be worthwhile.



51% frequently* capture the root cause of a change order.



52% frequently capture start, finish, and turnaround times.



55% frequently evaluate the impact of change orders on project schedules.

*Frequently = on over 50% of their projects



Let's compare: capturing and collecting information

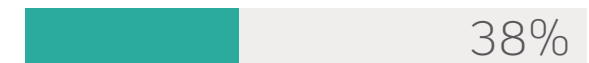
Along with understanding the headline figures, it's also useful to deep dive into the survey data to understand what information is most likely to be captured, and whether head contractors or subcontractors are more likely to collect critical project information.

- 1**
 - Only 38% of respondents are capturing errors, omissions, and constructability issues in the tender phase of construction documents.
 - Why act on this?** Dedicating more time and resources to this phase could help contractors identify potential risks and issues earlier in the project process. This could lead to a reduction in RFIs and change orders downstream, meaning less disruption in scheduling and productivity.
- 2**
 - 50% of respondents create a log of RFIs and responses for most projects.
 - Head contractors are more than twice as likely to capture and collect data around RFIs, responses, and change orders than subcontractors.
 - Why act on this?** If everyone spent more time reviewing documents before construction actually starts, RFIs and change orders could be significantly reduced.
- 3**
 - Of all respondents, 51% told us they frequently collect and document change orders.
 - Again, head contractors are more likely to document issues than subcontractors. Our survey found head contractors were significantly more likely to evaluate and include the impact to the project programme of change orders, compared with subcontractors.
 - Why act on this?** When all involved take the time to understand the impact of change orders on the project programme, it can lead to more united effort to avoid the factors that can cause significant project delays.

Companies capturing and collecting critical project information on at least half of their projects



1 | Capturing errors and omissions



2 | Capturing a log of RFIs and responses



3 | Collect and document change orders



Percentages of all survey respondents

Let's compare: reviewing past project information

1

- Of those who look for errors during constructability reviews, only 42% frequently* compare them with issues on past projects to find patterns and trends.

- **Why act on this?** If contractors review past information for errors, omissions and constructability issues, they can potentially mitigate issues that happen during the build phase, such as schedule slippage and change orders.

2

- Almost two thirds (62%) of those surveyed who said they capture RFIs and response times also compare this information to historical project data.

- **Why act on this?** By comparing today's projects to previous ones, contractors and project owners can identify and act on trends and patterns in RFIs and response times.

3

- About half of the companies we surveyed review documents to uncover the underlying cause of change orders on most of their projects, with subcontractors much less likely to do so than head contractors.

- **Why act on this?** Reviewing root causes could help prevent the same errors from happening again by enabling companies to catch them earlier in the design process.

Companies seeking to understand trends and root causes of issues on more than half their projects



42% compare errors to past projects



62% compare RFIs & responses to past projects



51% seek the root cause of change orders



*Frequently = on over 50% of their projects

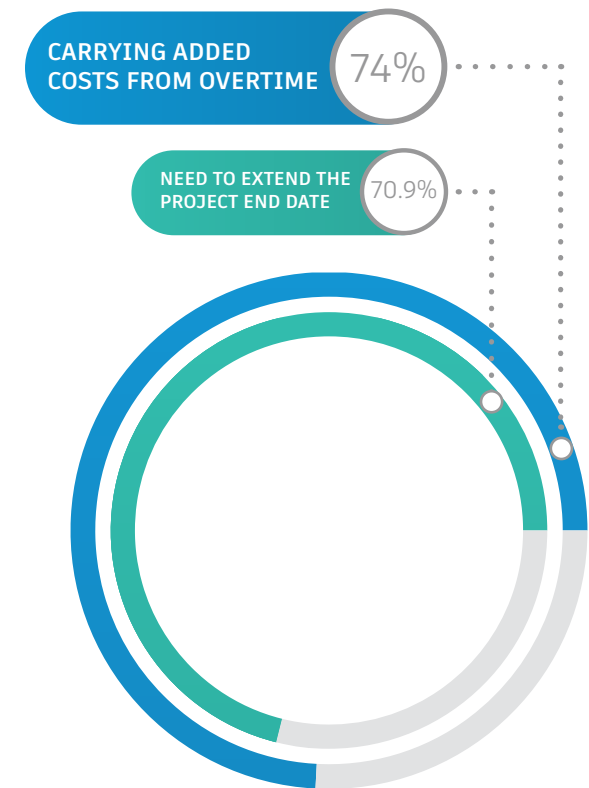


4. Updating the project schedule

To gain insight into the programming process and the prevalence of good schedule maintenance, we asked respondents how often they updated their project schedules. We also enquired about related activities and outcomes, including the financial effect of slippages.

Notable Statistics

- 36% of respondents reported they update project schedules daily or weekly. Head contractors are much more likely to leave longer between updates, with 46% of them only updating project schedules on a monthly basis.
- 23% of those surveyed said they update the schedule within two days of becoming aware of a situation that needs the schedule to be changed.
 - This number is extremely low, considering how important it is to capture schedule changes quickly so those managing and working on the project can have a clearer understanding of the status of the project—what's completed, what remains to be done and so on.
- Overall, 43% of those surveyed say they use look ahead schedules on more than half of their projects. These respondents more than likely belong to companies who are adopting additional Lean practices on their construction projects. Subcontractors are far less likely to take this approach, with only 30% doing so, compared with 51% of head contractors.

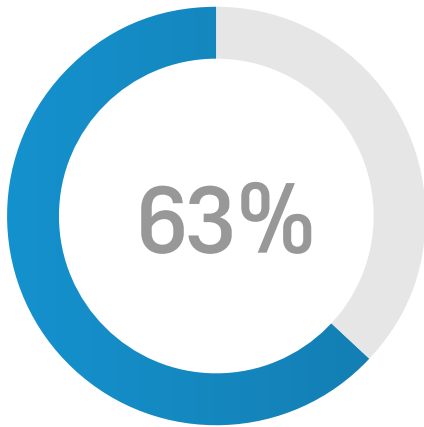


80% of project owners and clients are carrying added costs from overtime and related issues on at least a quarter of their projects due to schedule slippage, with 87% of them needing to extend the project end date.

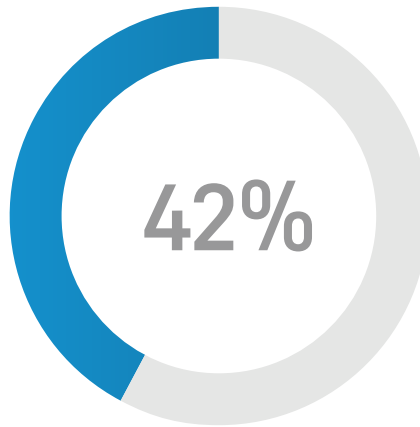
5. Software for safety & inspections

Being able to track and manage safety and inspection issues is crucial to sound construction project management. We asked respondents if, and how, they are using software to manage safety and/or inspections for their construction projects.

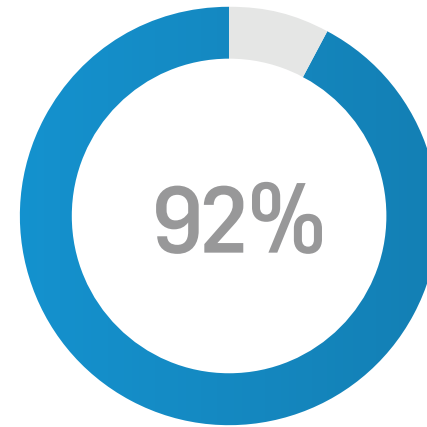
Notable Statistics



63% of head contractors are using software to manage safety and/or inspections on at least half of their projects.



We see a significant drop in software use by subcontractors, with only 42% using it to track safety and/or inspections.



92% of all respondents who use software to manage construction safety and/or inspections say it is valuable or very valuable to do so.



6. Labour productivity

When it comes to effective construction project management, fostering high levels of productivity on site and in the office is key. We asked respondents about the factors they believed are most likely to decrease productivity.

- For head contractors, problems with quality management, change orders and issues are the challenges they see as most likely to affect productivity.
- For subcontractors, the greatest issues damaging productivity are problems with coordination and communication, and poor schedule management.
- Across the board, head contractors were much more likely than subcontractors to see any of the factors mentioned as having a negative effect on productivity. This may be because they are more likely to have a bird's eye view of projects.
- Regardless of their role, it's clear that better communication between everyone involved in a construction project is crucial to improving productivity, as is working to ensure that people across the project can access the information they need to do their job and that no one is left waiting to work because of issues with schedule management.

Factors likely to decrease labour productivity

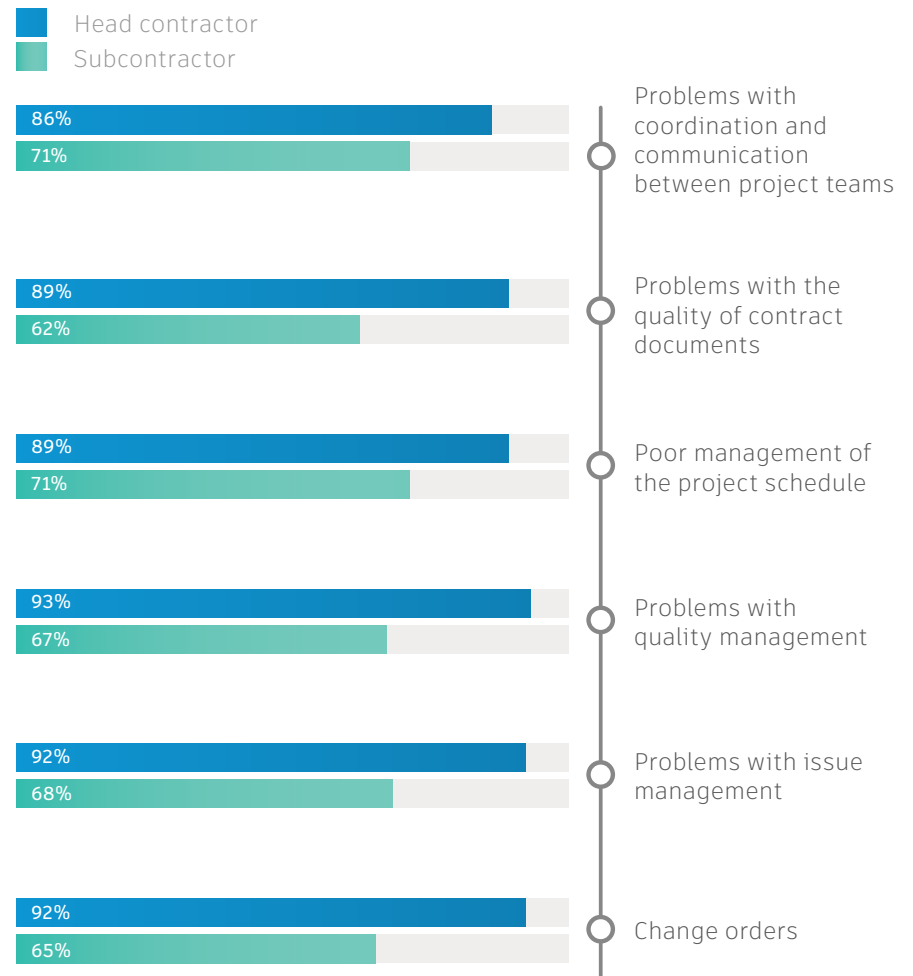


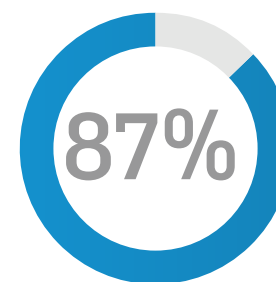
Chart show the percentage of those polled who said each factor had a medium, high or very high impact on labour productivity.

7. Quality and close out

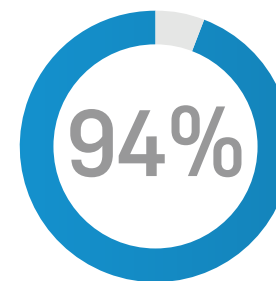
While defect lists were traditionally done at the end of construction projects, doing this work on the go can prove productive. We asked those surveyed which approach they prefer and if they use software to manage defect lists and close out. Getting off the job isn't always easy, so we also asked respondents about the close out problems they see and the financial impact these can have.

Notable Statistics

- 60% of head contractors use software to manage defect lists and close out activities on at least half of their projects. For subcontractors, this figure is much lower at 31%.
 - Of all respondents who use software in this way, 91% says it's valuable to do so and cite it as a key factor in improving the process.
- Three in five head contractors are using "defect list as you go" approach on at least half of their projects, while just over a third of subcontractors engage in this type of continuous close out activity.
 - Those who do defect list as they go appreciate the value of doing so, with 91% saying it is highly valuable to do this rather than try to complete the entire defect list at the end of the project.



87% of head contractors reported experience problems "getting off the job" on at least 25% of their projects.



94% say these delays have a moderate, high or very high negative impact on their profitability.



Let's Compare: KPIs Side by Side

What is the process data telling us?

- We see a trend that, in most cases, smaller companies are capturing this data at a higher frequency than larger ones.
- This could be that while larger companies are often more willing to try things on a one project/pilot basis, smaller companies are more successful at getting policies/ practices implemented consistently over all or most of their projects.
- This research aims to put a spotlight on these process-based-KPIs so that more people will be aware of them and therefore want to try implementing them.

Respondent Demographics

202 Total Respondents



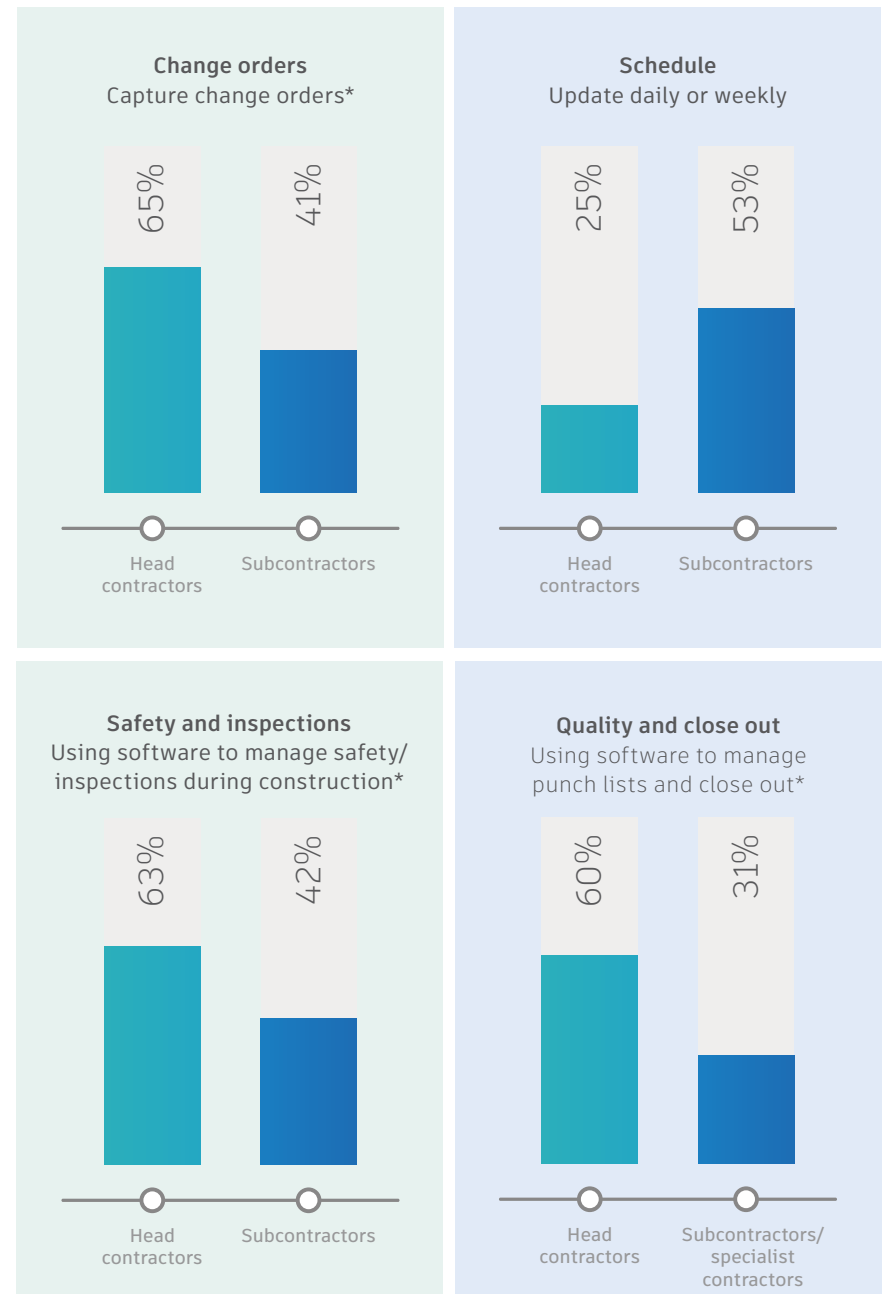
69%

HEAD CONTRACTOR OR
CONSTRUCTION MANAGEMENT FIRM



31%

SUBCONTRACTOR OR
SPECIALIST CONTRACTOR



*On more than half their projects

Conclusion:

Improving Project Process and Overall Company Performance

As an industry, where do we go from here? The data from the study tells us that adoption of best practices around these seven key activities is still relatively low, hovering at about half or fewer companies applying them to over half of their projects. The data also shows, however, that companies which frequently follow these best practices see them as really valuable, confirming they see improved project performance through their implementation.

This study offers at least a general understanding of useful industry benchmarks. You can use these seven metrics to assess your company's operations, identify areas for improvement, and begin setting standards for best practices in your company.

What gets measured gets managed

Over the past five years, the abundance of new technology tools available to contractors and project owners has helped them capture and track critical data and information on construction projects.

While metrics such as safety, profit and client satisfaction are vital, they only tell half the story, however. They won't necessarily help you improve outcomes on future projects. Looking for correlations between activities such as RFIs and change orders or RFIs and project programmes will help you to better understand the causes of project issues.

If you're digitally capturing this information with technology, the insights are there, you just have to dig them out and look for patterns that will help you identify areas of improvement.

Take the next step

Gathering the pertinent data, analysing it and using it in a meaningful way will not only help you to improve projects, but also to boost the overall operational performance of your company. By understanding key trends, issues, and other barriers that erode your project margin, you can set goals to improve those specific processes.

While it's important to use KPIs to see how you stack up against the competition, it's critical to first set benchmarks within your own organisation. This will not only help you to maximise company profits, but also contribute towards your goal of creating a safe environment for your workforce while continuing to deliver high-quality projects to your clients.



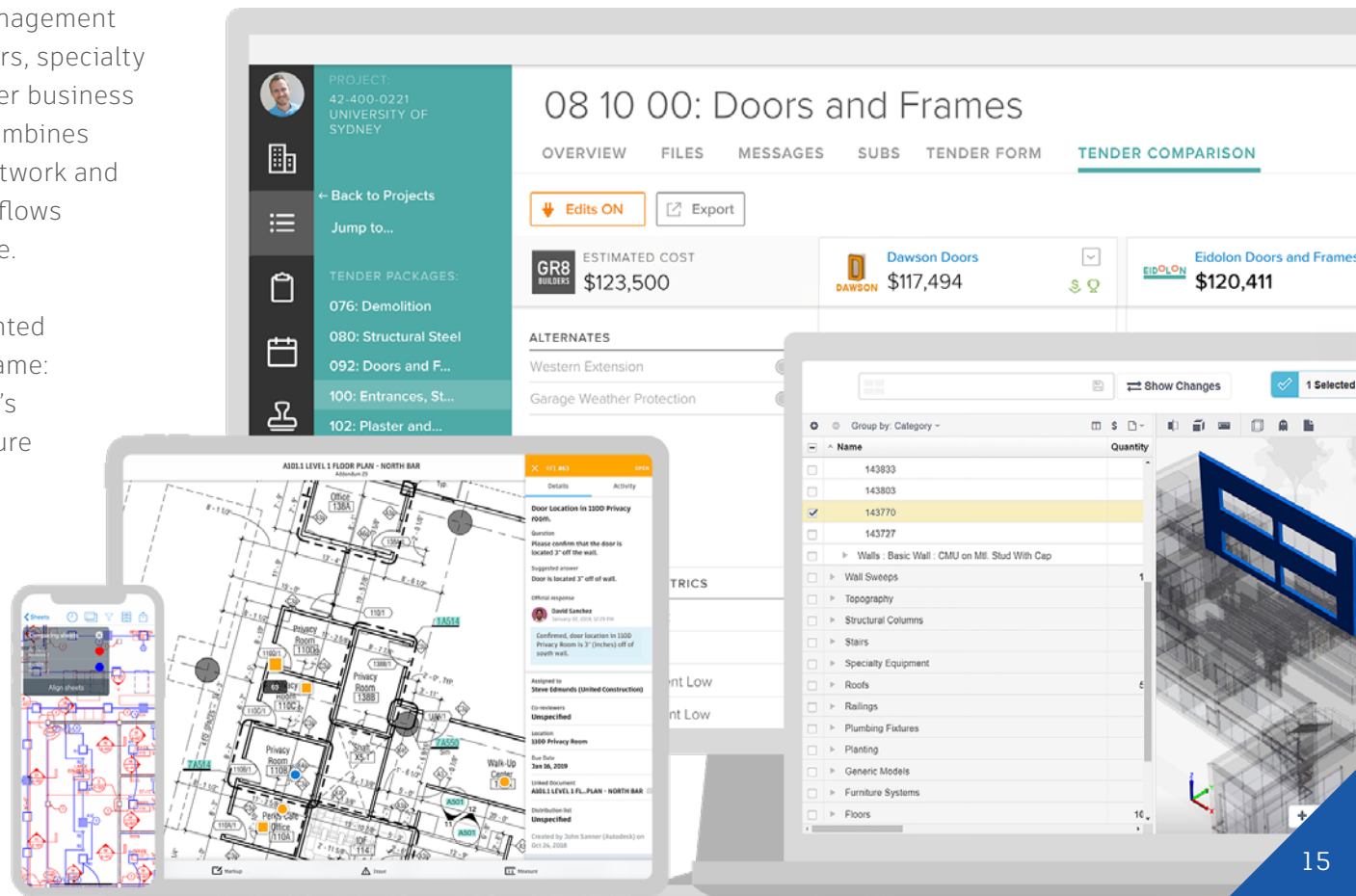
See the Future of Connected Construction

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Our industry requires solutions that connect their information, teams, and technology—breaking down data silos and disconnected processes that hinder true transformation. As we navigate the ever-present push to do more with less, we need to uncover new ways of working, enhance connected digital workflows, and incorporate advanced analytics. To support us on this journey of transformation, we must lean into tools that connect construction—from design to plan, build, handover, and operations.

Built on a unified platform and common data environment, Autodesk Construction Cloud is a powerful and complete portfolio of construction management products that empowers general contractors, specialty trades, designers and owners to drive better business outcomes. Autodesk Construction Cloud combines advanced technology, a unique builders network and predictive insights to connect teams, workflows and data across the entire building lifecycle.

While the industry experiences unprecedented transformation, our mission remains the same: to help construction teams meet the world's rapidly expanding building and infrastructure needs while making construction more predictable, safe, and sustainable. And we've remained steadfast in our promise to deliver the industry's most compelling solutions, connecting data, teams and workflows from the field. This is our commitment to connected construction.





With Autodesk software, you have the power to Make Anything. The future of making is here, bringing with it radical changes in the way things are designed, made, and used. It's disrupting every industry: architecture, engineering, and construction; manufacturing; and media and entertainment. With the right knowledge and tools, this disruption is your opportunity. Our software is used by everyone - from design professionals, engineers and architects to digital artists, students and hobbyists. We constantly explore new ways to integrate all dimensions of diversity across our employees, customers, partners, and communities. Our ultimate goal is to expand opportunities for anyone to imagine, design, and make a better world.

Connect with ACS



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