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Project Closeout in the Oil & Gas Industry

A Strategy to Improve Data Handover After Project Closeout Using Automation, Artificial Intelligence, and Industry Expertise

Contents

Introduction

New efficiencies matter now more than ever. Inaccessible information and mismanaged records pose enormous risks for the Oil & Gas (O&G) industry. We know the stories all too well. They have taught us how a lack of records management is a huge disaster with devastating consequences.

That is why many O&G organizations budget millions of dollars to dig up assets where information doesn't exist. For one company, it meant spending *billions* of dollars (yes, *billions*) to dig up 500 miles of natural gas pipeline, just to measure it and bury it again, so that engineers could re-document information they should have already had access to. But when lives are on the line, is there really a dollar value that can be defined to ensure public safety?

However, allocating millions of dollars to recreate data is not an effective long-term solution. And manual processes for records management are becoming less and less feasible.

In fact, we are already past the tipping point: there is a huge backlog of documents, and the pace of unstructured data generation is accelerating.

In our work in O&G and in document management, we have come across a common but complex problem around project closeout. We have seen that an ineffective project closeout process is risky business. It means thousands of unaccounted-for documents that can have financial, regulatory, and safety consequences.

There is a solution: automation. Innovations in Artificial Intelligence (AI) and Machine Learning (ML) are helping O&G organizations meet compliance and regulatory requirements, create value from their data, and become more competitive.

Backlogs in supply chain, engineering approvals, and the inability to find documents should not be taking up 70% of your technicians' working time. Successful project handovers make it possible to find the documents you need to get the work done.

This eBook takes an in-depth look at the project closeout process. We share ways an O&G company can overcome the challenges of document handover and build a strategy to get control of the document chaos, using automation, AI, and data to great advantage.

Enjoy the read.

Jason Cassidy
CEO and Founder,
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> I was recently speaking with a large upstream customer who has a backlog of four million records. If an individual can input and properly attribute about 5,000 to 10,000 documents per year into a content management system, that backlog is only going to escalate. You would need an army of 400 to 800 people just to get through the backlog. It is not going to happen – there is neither the time nor the money.

Chapter One

Project Closeout:
It's a Risky Business

Unstructured information management continues to be a challenge for organizations. According to Gartner, 80% of an organization's data footprint is attributed to unstructured data sources.[1] On average, organizations expect the volume of information coming into their organizations to grow 4.2x over the next two years.[2]

In O&G, decades of operations have resulted in stockpiles of documents. The industry has become data intensive, creating "digital landfills." Records are hard to locate, access, and, in many cases, may as well be lost.[3] And there are terabytes of it: aging in boxes in off-site storage, emails, or on the USB drives and laptops of employees.

If we look at the use case of project closeout, there is a large variety of unstructured data that Engineering, Procurement, and Construction (EPC) contractors must hand over after a capital project is completed. This includes:

- engineering drawings
- design specifications
- engineering analysis
- hydrostatic tests
- work orders
- purchase orders
- bills of materials
- equipment operating manuals
- sensor-enabled IoT data streams

We are looking at thousands of documents for a single capital-intensive project. According to one study, project handover can cost $100,000 or more and the effort of 30 full-time employees for one year.[4] The costs are even greater when the job is not done effectively.

U.S. capital projects lose an estimated $15.8 billion per year through an inability to properly manage project assets across collaborating firms and within their own various process systems. Eighty-five percent of this loss is assumed by owners that have to operate the facility for a span of 30 to 40 years or longer.[5]

Past, Present, and Future of Capital Projects

The impact of ineffective project closeout compounds when we consider how documents from new and past projects continue to be mishandled.

1. What do O&G companies do when historical data from assets that were built decades ago is needed?

In one example, it meant shutting down a section of the pipeline (at the cost of $8 million) to verify testing information that had taken place in the seventies. With no documents accessible, it was the only choice available.

For many O&G companies, there is little to no understanding of where historical documents are from projects completed decades ago. In the case of this natural gas provider, they had earmarked $200 million for these types of projects, just to validate information about assets. It is senseless spending if the right information is available.

2. How do O&G companies handle the handover of documents from EPC for projects taking place today?

For the majority of O&G companies, it looks like this:

- paper is loaded into scanners and digital documents are converted into PDFs

- documents undergo optical character recognition (OCR) to extract the proper attributes for machine reading

- OCR data is then uploaded into a system of record, where documents are fully attributed and can now be searched and managed

The individuals completing this task need intimate knowledge and expertise in records management, content creation, assets, supply chain, and how capital projects come together and conclude.

Rather than using this expertise, employees end up scanning documents blindly, without proper attribution, hoping that keyword search willmitigate the problem at some point in the future.

PHMSA Mega Rules

1. Gas Transmission Rule requires operators to reconfirm the maximum allowable operating pressure and meet updated reporting and record retention standards for pipelines.

2. Safety of Hazardous Liquid Pipelines Rule extends the reporting requirements and integrity assessments of pipeline with hazardous liquid.

3. Enhanced Emergency Order Procedures allows PHMSA to impose emergency restrictions, prohibitions, and other safety measures on operators.

This is the reality. Whether it is for the maintenance of an asset or regulatory compliance, these documents from past and new projects are critical to the future operations of O&G companies.

- *9,000 boxes of project closeout files*
- *8 employees manually reviewing each file, box by box*
- *10 to 20 documents scanned together*
- *$25/hr per employee*
- *3 minutes per document*

This O&G company is looking at roughly **3 years** to complete moving all materials into their systems and **$200 million** to address lack of documentation for an asset if information is required.

The Compliance Perspective – It's a Big Deal

Compliance is a major motivator. It's likely the number-one motivator. There are massive penalties and fines associated with the mismanagement of records. With the Pipeline and Hazardous Materials Safety Administration's (PHMSA) "Mega Rule" now in effect for all O&G operators, there is added pressure to ensure the safety and integrity of over 300,000 miles of onshore gas transmission lines.[6]

In some cases, this could be as easy as scanning the available records (assuming they can be found). However, it is estimated that **approximately 168,000 miles of pipeline have never undergone the hydrostatic testing** that is now required to comply with these regulations.[7]

Operators have to ensure all asset records are traceable, verifiable, and complete.

Additionally, 43% of all hazardous liquid pipelines were installed before 1970.[8] While pipeline manufacturing, construction, and maintenance have improved in recent decades, these rules require operators to make better use of their available data in order to understand potential safety risks and continuously improve.

It is clear: O&G needs accurate and accessible records to uncover compliance gaps and ensure the safety and integrity of their assets.

Chapter Two

Move Beyond Compliance: From Document Chaos to a Valuable Asset
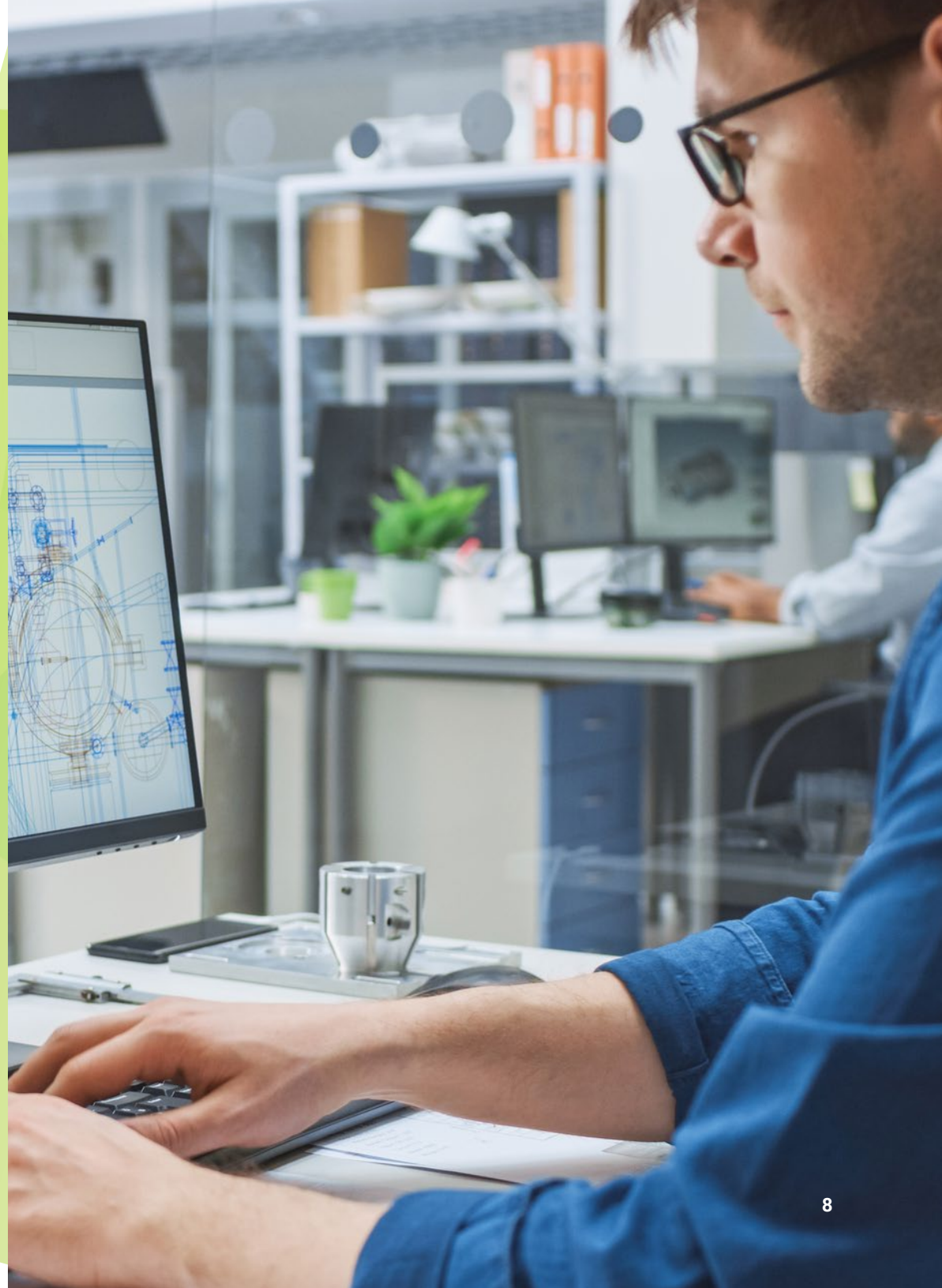
Data extracted from documents can be a valuable asset. How can your organization sort through the document chaos to find new efficiencies, gain competitive insights, identify compliance gaps, and transform business processes?

It starts by ingesting information, properly attributing it, and making it searchable in your systems.

Artificial Intelligence, Automation, and More

Digitization is well established in the O&G industry.[9] According to Gartner, AI solutions are on their way to becoming commonplace and are often used for natural language processing, pattern matching, and image analysis and recognition.[10]

When we look at document management, we have seen that humans alone are not up to the task of cataloguing the vast amounts of data involved. COVID-19 disrupted this even further – in fact, it put a complete halt to manual data entry and highlighted the vulnerability of this obsolete process.

What is obvious: pen and paper do not work, digital records are required, and automation and AI are needed to complement the specialized knowledge of humans.

Let us go back to the example of 9,000 boxes of project closeout files. This time, we will apply an Automation Workflow and AI to ingest, attribute, and provide search capabilities:

- Automation Workflow uses OCR to parse a collection of paper files into a single document

- AI detects proper page breaks, identifies attributes, and puts the file into the right folder with the right attributes

- employees use an augmented interface to review the result and apply their specialized knowledge to verify information before it automatically uploads to the enterprise content management system

- using computer vision, natural language processes, and pattern matching, every hydrostatic test and supporting document in the files can be identified

The results:

- from 3 to 20 minutes per document to 30 seconds per document

- from 3 years to less than 1 year to complete the backlog

- $200 million payback for accessible documents

- no need to repeat testing

Here is what we know:

1. project closeout is cumbersome

2. manual processes are not working

3. information availability is critical to compliance and safety

4. inaccessible information is very costly

Immediate Impacts for O&G

Taking steps to enrich data, manage it across systems, and automate governance provides the opportunity to extract value from information.

Reduce costs – Cost savings can be astronomical when compared against the possible impacts of inaccessible documents: not just reducing manpower costs for records management, but potentially saving millions of dollars by eliminating the need to re-test assets or pay regulatory penalties.

Drive efficiency – Accessible information provides numerous opportunities to become more effective and continuously improve. Organizations can assess lessons learned and apply best practices to future projects. Searchable files allow plant engineers to quickly find technical documents and asset information needed for maintenance teams. The data will prepare O&G to explore other areas such as predictive maintenance, digital twinning, and other future-looking initiatives.

Increase productivity and employee satisfaction – Employees no longer need to do the work of machines and can cut their time spent to less than a minute on each record. They can focus their attention on using their specialized knowledge to ensure documents are correctly understood and classified.

Enhance knowledge – More data means more opportunity: to understand supply chains, explore new and unfamiliar markets, evaluate asset security and safety, and compare performance against competitors.

Using AI can automate governance and compliance, but long-term benefits come from weaving document management into your business processes and putting the extracted insights into the hands of your experts.

"Too often records management is a compliance-focused initiative. It should not be the only driving force. Documents have valuable information in them. It is important to focus on how Oil & Gas companies can extract this value and weave it into their business processes to make competitive decisions."

Doug Schultz,
Upstream Energy Information Management Expert
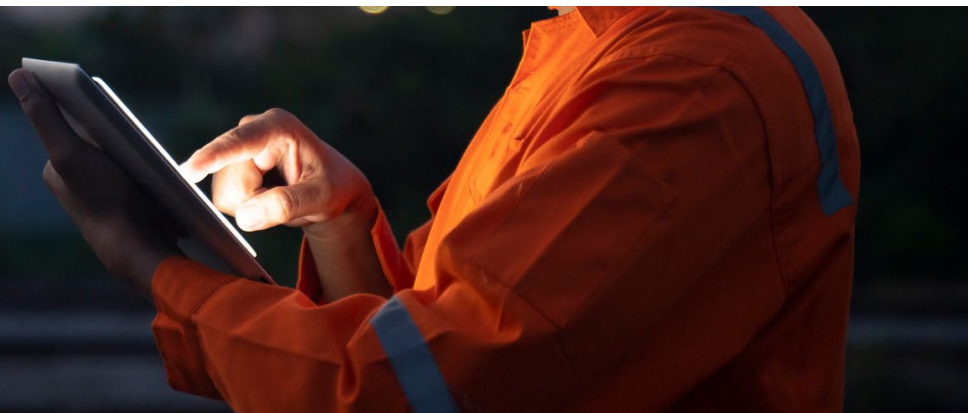
How to Approach Project Closeout

So, how do you get started? Well, it goes beyond technology: you need a strategy.

Project closeout has proven to be a complex problem that will only intensify without corrective action. That involves shifting the mindset of an organization that has done this work manually for 30+ years. Across the company, there needs to be an understanding of how innovation is going to be adopted and a commitment to creating 100% success for all parties.

Google-Like Search – O&G Information is a Robust Ecosystem

We often find that search engines such as Google have given would-be data miners a false sense of hope and security. Google provides a wonderful, connected experience using AI, natural language, and other technologies. If you want to find out when a restaurant is opening, Google knows you are looking for information about timing, not directions. The search engine knows that today's open hours and busy times are relevant to your question.

AI automation workflows make similar connections. It requires good content and quality metadata in your asset management systems. AI (with the help of natural language processing) can then extract relevant entities and categorize data. These AI-enriched documents are much easier to search and connect with similar documents for otherwise difficult tasks, such as finding all information related to an off-shore rig.

However, O&G information is extremely complex. Almost everything is private information, such as human resources records, employee certifications, or details of a particular event on a particular site. Some information may require government security clearance to access. All content must be treated with the same level of diligence as sites, assets, and materials.

O&G organizations have an interconnected ecosystem of documents that, with the right processes in place, can be searched, manipulated, and secured. The goal is to provide interfaces that help to understand, analyze, and integrate data quickly but in a way that respects permission requirements, security protocols, and the perspectives of all types of users (analysts, human resources, etc.).

"No matter how well everything is entered into the records management system, if data cannot be found, that is 0% success."

Jason Cassidy
CEO and Founder,
Shinydocs

The Strategy – What Does Complete Success Look Like?

Different things matter to different people within your O&G company. Understanding what is important to these stakeholders is key.

Let us start from a pipeline-integrity perspective and work our way backwards from the top level:

Phase 4 – Executives and Board of Directors

"Can we report to regulatory bodies?
Are we meeting compliance requirements?
Can we be future-looking and mitigate risks?
Are our employees focused on highest value tasks?
Have we automated the lowest value tasks?"

If yes, that is 100% success for this group.

Phase 3 – End Users

"Can my staff and I access data whenever we need it? Can we verify that the information we are looking at is up to date and has never been superseded?"

If yes, that is 100% success for this group.

Phase 2 – Records Management

"Are all the data records managed properly, attributed appropriately, and protected with proper security?"

If yes, that is 100% success for this group.

Phase 1 – Document Ingestion

"Have we done redundant, obsolete, and trivial analysis? Have we eliminated noise so that only important records are flowing throughout the system for automation?"

If yes, that is 100% success for this group.

Before beginning a project, it is important to identify who cares about each of these phases and work back to understand what complete success means, and what is achievable at each phase.

No matter how well everything is entered into the records management system, if data cannot be found, that is 0% success. A successful strategy needs to be built around translating technical capabilities into real-life outcomes and leveraging what is known from ERP systems.

However, the above example just gets an organization to the starting line. Achieving this first step paves the way for the rest of the document's life in order to drive content understanding and set the organization up for success with capabilities like Google-like search, full cloud migration, and more.

## Project Closeout Use Case for AI Automation Workflows

What we like about project closeout is that it is a containable use case. There are very specific classification buckets of content (likely around 30 to 40 common elements) for building granular automation. For many O&G companies, this is a great place to start to solve a complex problem.

What does this approach look like?

1. **Define the strategy –** what does success look like for project closeout activities? Who are key stakeholders at each phase? What outcomes do they want to achieve?

2. **Look at the information –** typically, this can be created in two streams:

   a) Well-established information that follows the same format, is straightforward to identify, and can be easily ingested and shared with end-users through automation. Documents may include work orders, hydrostatic tests, etc.

   b) Handwritten or otherwise unpredictably variable forms that are more difficult to automate. These could be documents such as vibration and compression tests.

3. **Automate ingestion into the ECM and use an augmented workflow for information that falls into stream two –** AI/ML will pull out as much information as possible, such as a line number, the site, geolocation, dates, and the type of document. Data stewards and a records manager will validate the automation process, make modifications if required, then publish to the ECM system.

4. **Search, find, and use data –** to drive business value, mitigate risk, and inform future initiatives.

> "Day one of document handover is when Oil & Gas companies need information ingested, searchable, and useable in their systems. AI and ML provide the only way to quickly gain insights and use data for the daily activities of managing capital assets. It is a task that humans haven't been able to effectively complete. Shinydocs' toolset and their teams' work in this industry are helping organizations do project closeout right on day one to efficiently manage capital assets through their lifecycles."
>
> **Doug Schultz,**
> Upstream Energy Information Management Expert
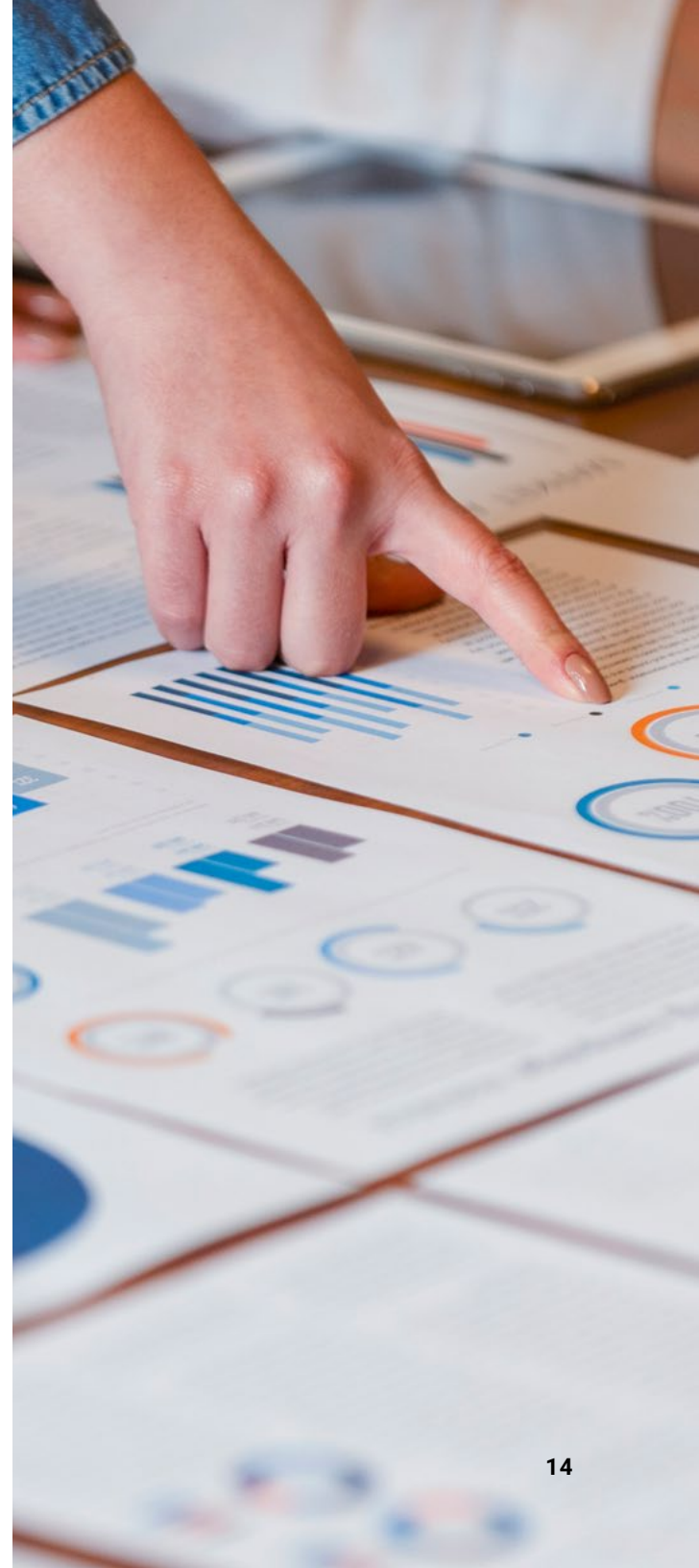
See It in Action

Ready to take the next step to automate project closeout? You can see it in action with a Proof-of-Concept.

Let's start with a discussion to understand your unique challenges around project closeout, and how to build a strategy that achieves your desired outcomes. Then, you can see Shinydocs Automation Workflow in action.

Get started by scheduling a meeting to see how your project closeout initiatives can be more efficiently managed.

Schedule Your Meeting Today

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