

# THE AUDIT TECHNOLOGY ECOSYSTEM

Written by Mark Edmondson,  
CEO Inflo

May 2023 and Updated Nov 2024



info



[www.inflosoftware.com](http://www.inflosoftware.com)

# INTRODUCTION

## THE AUDIT TECHNOLOGY ECOSYSTEM

For many years, leaders responsible for audit technology have wrestled with a strategic dilemma. That dilemma being whether to commit to a technology suite from one of the large incumbent providers, or to instead pick best-of-breed individual technologies.

Data suites promised an integrated approach yet required compromise, tolerating weaker solutions therein. Best-of-breed offered ideal point solutions but were problematic to integrate.

**“Cloud platforms and their API integration capabilities mean the suite versus best-of-breed strategic dilemma has now shifted.”**

There remains benefit in buying multiple solutions from a single technology partner, but only where these solutions fit a firm’s strategic objectives.

Forward thinking audit and accounting firms are now instead looking to build an audit technology ecosystem – a toolset which supports the end-to-end audit process through integrated technologies woven into an effective workflow.

In this whitepaper we explain in more detail what an audit technology ecosystem is and some of the key benefits of this approach.

### We also cover:

- The core technologies forming the center of your ecosystem.
- The most common solutions accounting firms use for these core technologies.
- Other technologies to consider including in your ecosystem.
- Further technologies large firms and networks use in their ecosystem.
- Practical advice, guidance and templates to help you design an audit technology ecosystem to support your firm’s strategy.

### This includes:

- Key principles to consider when planning your audit technology ecosystem.
- A template to help you evaluate your current technologies.
- Diagrams to help visualize your ecosystem.
- How to get started planning and building your ecosystem.

### Where to go if you need help

After reading this whitepaper and applying the included resources to your firm, you will be on your way to implementing an audit technology ecosystem which will modernize and future-proof your firm.

You will also have identified and prioritized the technologies you need to change to achieve a more efficient and effective audit process. Your audit will now harness integration and data automation to transform your day-to-day working practices.



---

## WHAT IS AN AUDIT TECHNOLOGY ECOSYSTEM?

An Audit Technology Ecosystem is a way for you to create your own suite of technologies, tailored to your precise requirements and your firm's strategy.

You can pick individual best-in-breed technologies and integrate them as if a single technology partner provided them. These technologies may be third-party or solutions developed in-house.

The emergence of cloud computing is a key enabler of this ecosystem strategy. Cloud solutions centralize the operation of the software used within the business and provide more control to technology leaders.

Cloud solutions leverage APIs to offer interoperability. APIs (Application Programming Interfaces) are a set of defined rules that enable different technologies to communicate with each other. APIs allow best-in-breed technologies

to be integrated with each other to support the ecosystem and replicate the suite proposition.

Typically, the cloud solutions with the most advanced API capabilities are offered by cloud-native technology providers. While legacy desktop vendors have been slowly migrating their solutions to the cloud, cloud native providers have not had to wrestle with this deadweight. This means they typically have superior API capabilities and have developed solutions which naturally support an ecosystem strategy.

## Benefits of an Audit Technology Ecosystem

### No compromise

Pick the best solution for each activity.

### Integration

Create a coherent, integrated user experience.

### Efficiency

The ecosystem drives automation and removes time wasting.

### Security

Access and confidentiality are managed across the ecosystem.

### Quality

Maintain and improve the standard of work being performed.

### Control

More easily monitor and oversee operations.

### Future-proof

More easily make future technology changes.

# CORE TECHNOLOGIES

## WORKPAPERS

Your audit technology ecosystem centers around your workpapers technology. Workpapers technology handles the engagement management to perform and document audit and other assurance engagements.

Instead of being the software equivalent of a filing cabinet, your workpapers technology should be the engine which powers your car.

### Key features include:

- Storing all documentation created to evidence work performed.
- Project managing deadlines and milestones across the engagement.
- Supporting risk assessment and the audit plan to structure work.
- Structuring complex engagements such as group audits.
- Capturing findings and other outputs.
- Producing required client communication and reporting.
- Archiving and retaining the completed engagement.

### Key benefit of digital workpapers technology:

As the core of your ecosystem, connectivity is key. A digital workpapers tool acts as the hub to integrate with all your broader ecosystem technologies and creates a coherent and effective end-to-end engagement workflow.

### Common workpapers technologies:

- Inflo Workpapers
- CCH ProSystem fx Engagement /Axxess
- Caseware desktop/cloud
- Thomson Reuters Engagement Manager
- AuditFile

Cloud platforms are inherently easier to create integrations in. You will significantly impair your ecosystem if you cannot leverage API connectivity, or effectively export data from workpapers.

## METHODOLOGY

The audit process is driven by your methodology. Often methodology content and workpapers technology are considered in combination, and over time the line between technology and methodology has become blurred.

But with more effective content management capabilities becoming available, tailoring third party methodologies, or building bespoke methodologies is an important ecosystem consideration. Industry-specific content is essential to tailor the approach to client niches and provide valuable services.

### Key features include:

- Workprograms or forms detailing the procedures to be performed.
- Practice aids and guidance to support teams.
- Templates to standardize documentation.
- Calculators to support sampling.

### Key benefit of digital methodology:

The efficiency and effectiveness of your engagement delivery is heavily dependent upon your audit methodology. A digital methodology leverages data to automate several time consuming areas, saving time and allowing teams to focus on higher risk areas and higher value activities.

### Common methodologies:

- Inflo Digital Audit Suite
- Thomson Reuters Checkpoint Engage/ PPC
- CCH Axcess Knowledge Coach
- CPA.com Dynamic Audit Solution + OnPoint Audit + OnPoint EBP + OnPoint PCR
- Wiley Advantage Audit

A methodology is not just about work programs, forms and checklists. It should represent an efficient and effective workflow from creating the engagement through to archiving it.

---

## TRIAL BALANCE

Most audit and assurance engagements involve financial information. And the most important data set is the client trial balance. Again, often incorporated into workpapers solutions, trial balance technologies manage the lifecycle of the trial balance, structuring this data and handling changes during the engagement.

The increasing use of data to fuel automation and populate data warehouses means effective management of trial balance information is vital.

### Key features include:

- Mapping the client trial balance to a standard taxonomy.
- Integrity and validation checks.
- Preparing lead sheets.
- Booking journals and adjustments.
- Consolidating and aggregating group engagement trial balances.
- Sharing trial balance data within the ecosystem.

### Key benefit of digital trial balance technology:

As one of the main drivers of a digital approach, more discipline is needed when handling data. A digital trial balance tool saves time through simple automation, unlocks more advanced data-driven techniques and drives innovative byproducts such as data warehouses.

### Common trial balance technologies:

- Incorporated within the audit workpapers solutions above.

Automation requires standardization. Handling trial balance data better is low-hanging fruit – a simple area with a big, time-saving pay off.

---

## CLIENT COLLABORATION

Audit and assurance engagements involve more than just trial balance data. A significant number of files and communications are required from clients. Client collaboration technologies handle prepared-by-client lists, with clients uploading documents and comments to a secure shared area.

With the increase in remote and flexible working, having an effective means to exchange information with clients and colleagues is essential to delivering a modern engagement.

### Key features include:

- Requesting files and comments from clients.
- Project managing due dates and deadlines.
- Assigning accountabilities across different individuals.
- Status tracking information upload on the engagement and portfolio.
- Securely storing and purging client information.
- Reporting on information delays.

### Key benefit of digital client collaboration technology:

Delays in client information cause significant inefficiencies. A digital client collaboration technology offers transparency of client readiness and saves significant time exchanging information – for the engagement of both teams and clients.

### Common client collaboration technologies:

- |                         |                                   |
|-------------------------|-----------------------------------|
| • Inflo Collaborate     | • CCH Axcess Client Collaboration |
| • Suralink              |                                   |
| • Thomson Reuters Onvio | • CPA.Com OnPoint Collaborate     |

Improving client collaboration is one of the quickest ways to save time. The fact clients love the approach makes it a win-win.

---

## DATA INGESTION

While trial balance data represents the low-hanging fruit of audit automation, the digital audit empowers a more extensive use of data. Data ingestion technology extracts transactional data from the client general ledger accounting system, transforming this data into a standard data model format, checking it for completeness and accuracy and loading the data into tools for advanced automation and analysis.

While audit data analytics technologies claim the glory of more efficient, higher quality and more insightful auditing, data ingestion technologies underpin this, ensuring that data is accessible and reliable to meet regulator expectations.

### Key features include:

- Securely extracting data from client general ledger accounting systems.
- Transforming the data structure into a common data model format.
- Supporting transformation of underlying data to improve granularity.
- Performing completeness checks through a trial balance reconstruction.
- Performing validity checks to assess the quality of data.
- Loading the data into audit data analytics and other tools..

## Key benefit of digital data ingestion technology:

This is about establishing a secure data pipeline from your client accounting system to your ecosystems. Data ingestion technology avoids your team getting bogged down wrangling with poorly formatted data, freeing them to focus on analyzing the data and giving confidence in the results.

## Common data ingestion technologies:

- Inflo Ingest
- Validis
- Finagraph Strongbox

Technology alone cannot ingest data from all your clients. To achieve this critical requirement, Inflo complements technology with a white-glove service provided by experienced data scientists to support 100% of accounting systems.

## AUDIT DATA ANALYTICS

Much of the client benefit of a digital audit is driven by data analytics. Audit data analytics technology leverages anomaly detection and visualization techniques to support auditors understanding, analyzing and interrogating large data sets to replace traditional auditing tests with new, superior auditing techniques.

Audit data analytics is a broad church. The initial focus when implementing a digital audit approach should be on data analytics techniques which are relevant to all engagements, using general ledger and trial balance data, e.g., risk assessment ratios and visualizations, or journal entry anomaly detection. Only when you have mastered such techniques should your focus shift to sub-ledger and bespoke engagement- specific data analytic techniques.

## Key features include:

- Preparing visualizations for analysis.
- Running anomaly detection routines for review.
- Selecting anomalies and samples for audit testing.
- Generating documentation to evidence testing performed.
- Producing client facing value-add insights and reports.

## Key benefit of digital audit data analytics technology:

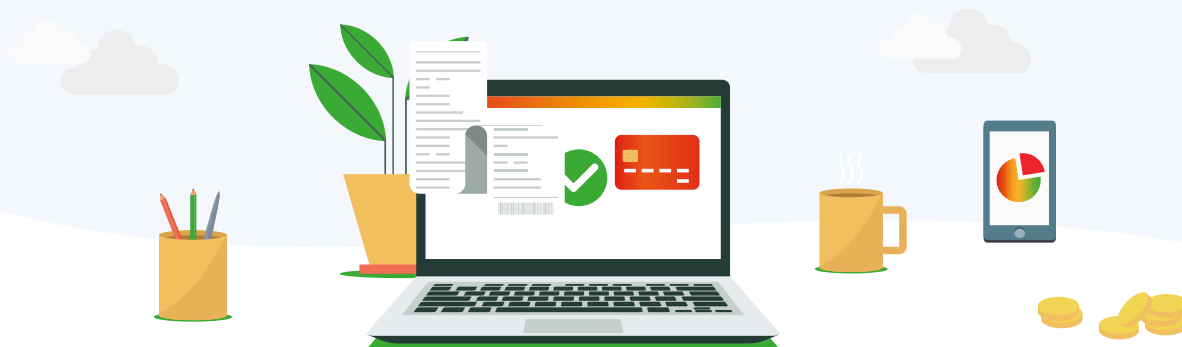
This is truly transformational. Initially the focus should be on replacing dated auditing techniques with more powerful alternatives. But audit data analytics unlocks far bigger opportunities to holistically modernize the audit process – saving time, improving the quality of work, advancing the skills and careers of auditors, and providing far more value to clients from the audit.

## Common audit data analytics technologies:

- Caseware IDEA
- MindBridge
- TeamMate Analytics
- Inflo Data Analytics

Supporting teams on the transition from old audit tests to new audit data analytics is often best approached in stepped phases. Methodology integration, guidance, and clear communication to audit teams are the secrets to making the change.





---

## BUDGETING

The profitability of audit services is often dependent upon a diligent engagement budget. Often combined with resource planning technologies, budgeting technologies plan the time and expense cost of delivering an engagement.

More consideration should be given to the engagement budgeting process when moving to a digital audit process. Alternative approaches should be evaluated, with time allocated to increase audit planning effort and consider the senior team involvement. Areas such as remote working versus on site visits, interim testing and outsourcing of work should also be costed and appraised.

### Key features include:

- Planning the staffing resources required.
- Forecasting senior time.
- Budgeting for expenses and out-of-pocket costs.
- Costing the use of outsourcing resources.
- Calculating the total delivery cost and engagement profitability.

### Key benefit of digital budgeting technology:

Effective budgeting evaluates different potential delivery approaches. It identifies the most profitable execution path and supports status tracking of costs versus budget throughout the engagement so you can track work-in-progress against the original plan.

### Common budgeting technologies:

- Dayshape
- IRIS Star and Practice Engine
- Karbon
- CCH ProSystem fx Practice Management
- Thomson Reuters Practice CS
- Workday

Budgeting is more important when your audit is less reliant on a same-as-last-year (SALY) mindset. If you can't budget a profit at the start, you are unlikely to achieve a profit at the end.

---

## RESOURCE PLANNING

The digital audit offers an opportunity to change the way audit engagements are resourced.

Resource planning technology assigns team members to perform engagements, leveraging the engagement budgets to allocate which auditors work on which clients on which days.

Resource planning should no longer be considered as block-booking staff for multiple weeks of audit fieldwork. A more effective approach is collaborative and involves challenging and flexing engagement budgets. Being more flexible on staff continuity and shorter bookings, e.g., four days, helps realize engagement efficiencies.



### Key features include:

- Assigning team members to engagements.
- Identifying unstaffed engagements and unassigned resources.
- Showing busy periods when client commitments exceed available resources.
- Highlighting conflicts, where continuity individuals are required on multiple clients.
- Managing annual leave, training and other non-chargeable work.
- Allowing individuals to request assignment to clients of interest.

### Key benefit of digital resource planning technology:

Efficiencies are possible from a digital audit through both automating the current work and rethinking resourcing. Resource planning technology allows you to maximize the total output of your team, through deploying resources in an optimal way.

### Common resource planning technologies:

- Dayshape
- Smartsheet Resource Management
- Beeye
- Retain

Efficiency only matters if you capture the time saved and do something with it. Better resource planning helps with both.

## TIME AND BILLING

It is still important to evaluate the profitability of individual digital audit engagements. Time and billing technology tracks the time spent performing the engagement and supports invoicing clients.

Often viewed as an administration task, accurate recording of time supports the identification of increases in the scope of an audit, which may warrant additional fees, and helps support continual improvement in future years. Combined with client collaboration technologies, it can quantify the billable impact of client information delays.

### Key features include:

- Assigning team members to engagements.
- Identifying unstaffed engagements and unassigned resources.
- Showing busy periods when client commitments exceed available resources.
- Highlighting conflicts, where continuity individuals are required on multiple clients.
- Managing annual leave, training and other non-chargeable work.
- Allowing individuals to request assignment to clients of interest.

### Key benefit of digital time and billing technology:

Diligent time and billing means you are always in control of engagement economics and can respond on a timely, proactive basis to issues which will impact profitability.

### Common time and billing technologies:

- CCH Practice Management
- Thomson Reuters Practice CS
- Workday
- IRIS Star and Practice Engine
- CCH Axcess Practice
- Karbon

Billing for scope increases or client information delays results in profit. Timely identification of such items is critical to recoverability and client relationships.

---

## BANK CONFIRMATION

Audit standards necessitate specific procedures regarding bank and loan balances. Bank confirmation technology replaces manual bank letters, directly requesting and obtaining confirmations to verify the facilities clients hold with financial institutions.

While the emergence of open banking begins to challenge the need for bank confirmations, this task continues to be an important part of the audit process and to address the risk of fraud.

### Key features include:

- Requesting confirmations from financial institutions.
- Status tracking confirmations.
- Chasing outstanding confirmations.
- Collecting confirmations.
- Verifying the authenticity of the confirming party.

### Key benefit of digital bank confirmations technology:

Bank confirmations technology is more efficient than the traditional manual bank letter approach and provides additional validation over the authenticity of confirmations received.

### Common confirmation technologies:

- Thomson Reuters Confirmation
- Circit

Consider whether to deploy a centralized admin resource to manage bank confirmation technology and remove this task completely from engagement teams.

---

## ESIGNATURE

The digital world challenges traditional activities, such as physically signing paper. eSignature technology obtains digital approval of PDFs and other documents.

To create a digital experience for your client, it is important key documents to the audit, such as engagement letters, management representation letters, and financial statements are approved effectively and efficiently.

### Key features include:

- Capturing signature and approval of documents.
- Securing key documents and protecting confidentiality.
- Authenticating the signing party.
- Automating reminders on unsigned documents.

### Key benefit of digital eSignature technology:

eSignature technology offers a better user experience, allowing clients to audit documents more easily and securely.

### Common eSignature technologies:

- Inflo Collaborate
- Adobe
- Docusign
- Signable
- E-sign

Integrating eSignature with client collaboration means clients have a single place to upload, receive and approve documents, improving client experience.

# OTHER AUDIT TECHNOLOGIES

Beyond the core technologies integral to a digital audit ecosystem, various niche audit tools act as bolt-ons to enhance workflow integration and align with your audit methodology.

## **Client Take On / Continuance**

Verify client appropriateness and potential risk.

## **PDF Conversion and Automation**

Transform PDFs to streamline Excel tasks.

**DataSnipper** supports extracting and cross-referencing PDF documents to perform tasks such as controls and substantive testing or checking financial statement accuracy.

## **Disclosure Checklist**

Verifying the completeness and accuracy of financial statements disclosures..

## **Open Banking**

Obtaining transactional activity from bank and loan accounts to support audit testing and verify bank verify bank balances.

## **Audit Procedure Automation**

Simplifying financial statement validation by instantly ensuring mathematical accuracy and consistency.

**Trullion** is streamlining common audit procedures. Their proprietary use of AI and automation lets users intelligently extract, match, and validate data across different documents.

## **Internal Reporting**

- **Portfolio**

Analyzing engagement metadata to track engagement status and support monitoring, peer review, and other quality procedures.

- **AQIs**

Tracking audit quality indicators to support engagement quality monitoring.

- **Quality Management**

Housing a System of Quality Management to document, monitor and maintain a system as required by the auditing standards.

Inflo QMS supports firms implementing, monitoring and maintaining a compliant System of Quality Management.

## **Client Research**

Summarizing press releases and other announcements by clients to support understanding the entity and risk assessment.

## **Contract Reading**

Analyzing complex legal agreements to identify unusual terms, supporting work over revenue recognition or provisioning.

## **Inventory Observation**

Apps which support performing year-end inventory counts.

---

## FURTHER LARGER FIRM / NETWORK AUDIT TECHNOLOGIES

There are further technologies relevant to the audit ecosystem, but which are typically only used by the largest firms and networks.

### Independence Tracking

Managing risks and maintaining independence from audit clients.

### Component Auditor Communication

Requesting and obtaining communication between the group audit team and component auditors.

### Quality Inspections

Supporting the information exchange and documentation of internal or external quality inspections.

### Experts & Specialists

Planning and facilitating the involvement of experts and specialists in the audit process.

### Technical Consultations

Facilitating engagement teams consulting with technical subject matter experts on complex audit issues.

### Drones

Performing complex inventory observations using drones.

---

## OTHER RELATED TECHNOLOGIES

Beyond the audit process, additional technologies play a role in allowing the audit ecosystem to operate, and to support the broader firm's technology ecosystem

### Active Directory

Supports the use of Single-Sign-On to improve user experience and maintain security across the ecosystem.

### Financial Statements

Produces client financial statements from trial balance data, compliant with varying accounting principles.

### Corporate Tax Working Papers

Supports the document management, workflow and deadline management of corporate tax services, commonly provided to audit clients.

### Corporate Tax Compliance

Produces corporate tax submissions.

### Data Warehouse

Collates client data and engagement metadata within a separate data warehouse for backup and potential broader use.

---

## KEY PRINCIPLES OF ECOSYSTEM TECHNOLOGIES

Building an effective ecosystem requires a focus on certain key principles. These key principles are the secret to successfully creating and implementing your audit ecosystem.

### Cloud-First

Focusing on cloud solutions for your core technologies is fundamental. The ecosystem relies upon interoperability. This is far more challenging to achieve with desktop solutions operating in isolation.

### API-Centric

Integrating the different technologies across your audit ecosystem requires APIs.

### Cloud-Native Providers

Because of the importance of the cloud-first and API-centric principles, cloud-native providers offer huge benefits. While legacy vendors wrestle with migrating their desktop solutions to the cloud, cloud-native companies are free from this baggage and offer more agile development and continual improvement.

### Data-Driven

As the lifeblood of the audit ecosystem, having a coherent data strategy across all your technologies is critical. Seek technologies which not only use data for automation themselves but are able to share data with other ecosystem technologies or for reporting.

## Workflow, Workflow, Workflow

With many tools involved or available, it is important to map out and document the end- to-end engagement workflow. Every tool must be woven into the workflow and team members must consistently follow the designed workflow.

## Client Impact

Consider how technologies impact your client and their experience. Do they add value? Do they save them time? Your ecosystem may change how you approach the audit – you want to be able to sell the benefits of changes in your approach to your clients.

Adopting these principles across your ecosystem strategy and your technology selection process will help you arrive at a transformative approach which is also simpler to implement.

---

## GETTING STARTED

Implementing an audit ecosystem is a journey which will not happen overnight.

Planning any journey is about understanding where you are and identifying where you are trying to get to.

An audit ecosystem should be aligned to your firm's strategic vision.

### For example:

- What size of clients do you want to audit?
- What industries of client do you want to specialize in?
- How do you want to differentiate from your competitors?
- What are your growth objectives?

So, if your strategic vision is not clear and agreed across your audit leadership team, start here. Take a few hours and discuss as a team where you want to be as an audit business in five years.

## Current State

When you are clear on the vision for your future audit business, it is time to focus on the current state.

Map out your current tools and assess how they are meeting your requirements. Do they fit your five year vision? Do they meet the key principles?

Focus on the core technologies first and foremost, as improving these are priority for longer-term success. The Appendix to this guide includes resources to help you map out and assess your current technologies.

## Prioritizing Changes

It is likely your current state requires multiple changes to advance you towards your five-year vision. You will not be able to make all these changes tomorrow, so it is important to prioritize where you focus your efforts.

List out the changes you want to make. Start to prioritize them and pencil in dates you would like a new solution to be implemented.

Don't get distracted by trendy technologies which aren't aligned to your vision. Focus on your core technologies, in particular your Workpapers solution and audit methodology. If these technologies are not fit-for-purpose, then it is critical you form a plan for improving these as soon as possible.

It might be that changing technologies will take time. Don't think of this as a linear progression. While advancing a process to change your audit Workpapers solution and audit methodology you could be simultaneously implementing a new approach to client collaboration.

Also consider how you might implement each change. Would this be a big-bang implementation, where all engagements move to the new solution from an agreed date? Or would you use a phased implementation approach to initially implement it on only certain offices, client niches, or Partners?

## HERE TO HELP

Designing an audit ecosystem doesn't need to feel daunting. If you want to embrace the audit ecosystem concept but don't have the time or feel overwhelmed, then don't procrastinate – help is at hand.

Reach out to the Inflo team today. As former auditors with experience of a broad range of audit technology implementations they will answer your questions and objectively assist your process.

For a free no obligation call [click here](#) and mention this whitepaper. Beyond the audit process, additional technologies play a role in allowing the audit ecosystem to operate, and to support the broader firm's technology ecosystem.

## ABOUT THE AUTHOR



Mark has spent his career developing technology that empowers accounting firms with cutting-edge computing power.

Mark started his career in a small-town accounting practice before earning his stripes at a Big Four firm leading audit

and consulting engagements. In his time at PwC Mark played a key role leading several global innovation projects. These projects transformed the technology and processes used by over 15,000 PwC auditors around the world.

He founded Inflo in 2016 to revolutionize the broader audit and accounting profession with next-generation software. Mark is now influencing the advancement of audit at a global level.

He is a member of the International Auditing and Assurance Standards Board's (IAASB) Technology Working Group and Less Complex Entities Reference Group, as well as chairing the AICPA's Data Standards Working Group. Mark also supports professional accounting bodies around the world.

You can contact Mark at

[mark.edmondson@inflosoftware.com](mailto:mark.edmondson@inflosoftware.com)



To learn more about Inflo, use the QR code or visit [www.inflosoftware.com](http://www.inflosoftware.com)

## APPENDIX

1. [Current State Evaluation](#) 
2. [Audit Eco-System Outline](#) 