

A Guide to Autonomous AP:

How autonomous invoice processing
supercharges finance transformation

Invoices

Status	Invoice	Amount
PROCESSED	#200257	\$2,930.01
PROCESSED	#526534	\$406.27
PROCESSED	#0006587	\$446.61
PROCESSED	#200257	\$1,105.55
REVIEW DATA	#100134	\$1,237.60

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Why finance transformation is strategic for finance teams

Artificial Intelligence (‘AI’) is transforming every global industry and function. Finance is no exception. Take the example of Intuit, the financial software, and services firm that brought the world QuickBooks and TurboTax, recently exceeded its earnings estimate for the fourth straight quarter in a row. This consistent delivery of strong growth can be attributed to Intuit’s highly successful business model that embraces [ongoing digital transformation](#) not as a one-time process but as a permanent feature of how the company operates. [AI-driven finance transformation](#) in areas like T&E is a big part of its digital transformation.

A finance function transformed by AI can deliver significantly greater value in the following areas:

Cost reduction

- dramatic reduction in the cost per transaction (e.g., cost per invoice)
- lower spend leakage due to weak controls, fraud, and duplicate transactions
- optimizing all total cost factors including discounts, working capital, payments, and tax

Straight through processing

- end to end processing without errors and exceptions leading to a lean process
- shorter invoice cycle time leading to lower queries from employees and suppliers and help desk costs

Agility

- rapidly adapt to changes in regulation, supplier ecosystem, and internal policies and practices

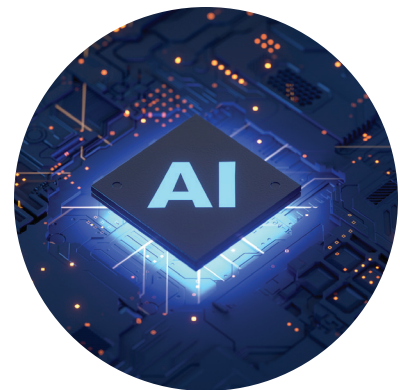
Supplier and stakeholder experience

- ease of doing business for suppliers with timely payments, no requirement to invest in e-invoice technology or change current invoicing methods
- greater stakeholder satisfaction with faster processing, better supplier relationships

Upskilling finance teams

- greater focus on strategic activities as time freed-up from tactical tasks
- upskill AP staff to work with new-age technologies such as computer vision, AI, intelligent process automation

AI works best when combined with finance domain expertise and process orchestration and together with existing finance automation technologies.



Why finance automation alone won't deliver



Finance automation technologies alone are not enough to deliver on the promise of significant cost reduction, lean processing, agility, and customer experience.

Many generations of automation technology have benefited finance departments, including:

- enterprise resource planning (ERP)
- finance analytics
- procure-to-pay (P2P)
- travel & expense (T&E)
- invoice automation (IA)
- supplier networks/ portals
- collaboration and productivity tools
- optical character recognition (OCR)
- robotics process automation (RPA)

All of these automation innovations **help users** perform tasks, make decisions, and act faster with less manual effort. But **users are still primarily responsible** for reviewing, interpreting, and choosing the best course of action for all financial transactions.

Keeping users at the center adds human friction, errors, time, and cost to financial processes, limiting the magnitude of finance transformation achievable.

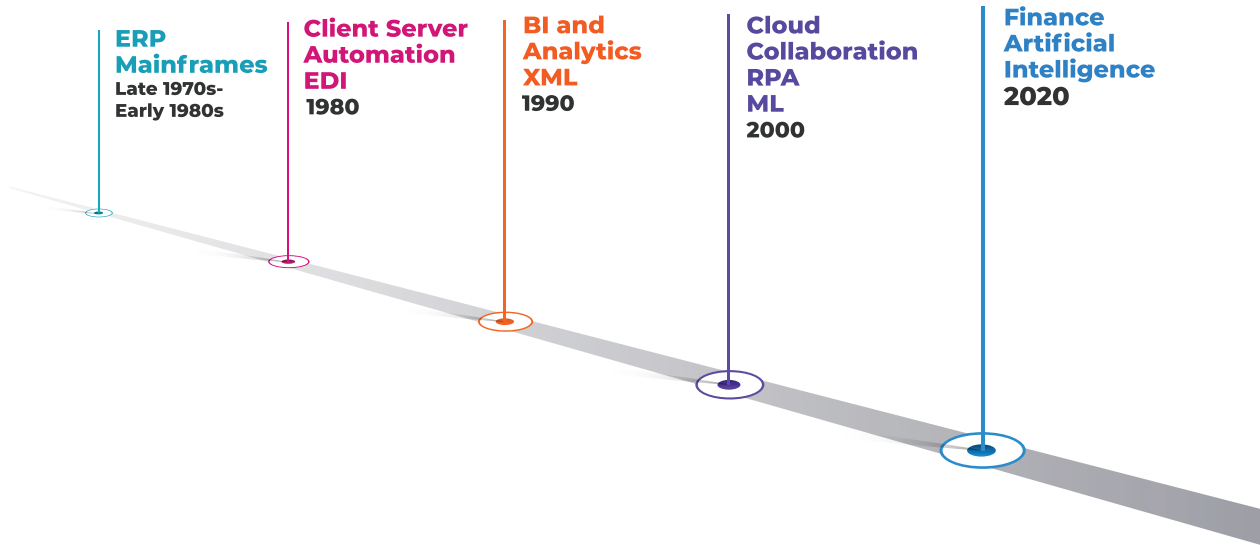
Take the example of **invoice processing**, which has witnessed at least 50 years of



successive automation attempts with legacy optical character recognition (OCR), legacy invoice automation, procure-2-pay (P2P) automation, and robotic process automation (RPA).

Five decades of hard work have all improved on a fully manual Invoice process but left the problem only partially solved. And in the last few years, the progress has slowed.

TECHNOLOGY TRANSFORMING FINANCE APPLICATIONS



Invoice automation efforts have helped AP staff capture some data (though never with 100% accuracy), speed-up workflows, and automate calculations.

What none of these solutions have done, or could do, is lead to a **truly autonomous invoice processing** where **AI software makes the decisions** — extraction, validation, coding, matching and invoice approval, rejection or request for expert review.

As a result, invoice processing still takes a lot of human effort, cost, and time. A temporal analysis of the top challenges of AP leaders from 2013 through to 2020 in Ardent Partner's the State of ePayables reports highlights that across this 7 year period:

- lengthy processing times is still the #1 challenge faced by AP leaders (affirmed by 47% of AP leaders)
- high invoice processing cost is still the #2 challenges faced by AP leaders (affirmed by 35% of AP leaders)

As you can see, existing technology solutions all face challenges. Significant improvements in operating costs and spend, lean processing and cycle times, agility, and customer experience, can not be delivered by automation alone.

Challenges remain for finance transformation and AP leaders



Finance transformation leaders face challenges

Finance transformation leaders are faced with ever-increasing C-suite and CFO expectations around digital-led and digital-enabled growth. Many corporate executives are still waiting to see the ROI from well-funded finance transformation programs. In reality, corporate and finance digital transformation programs have been impeded by excessively high expectations, employee resistance, lack of effective change management, digital skills gaps, and a failure of initial pilot projects.

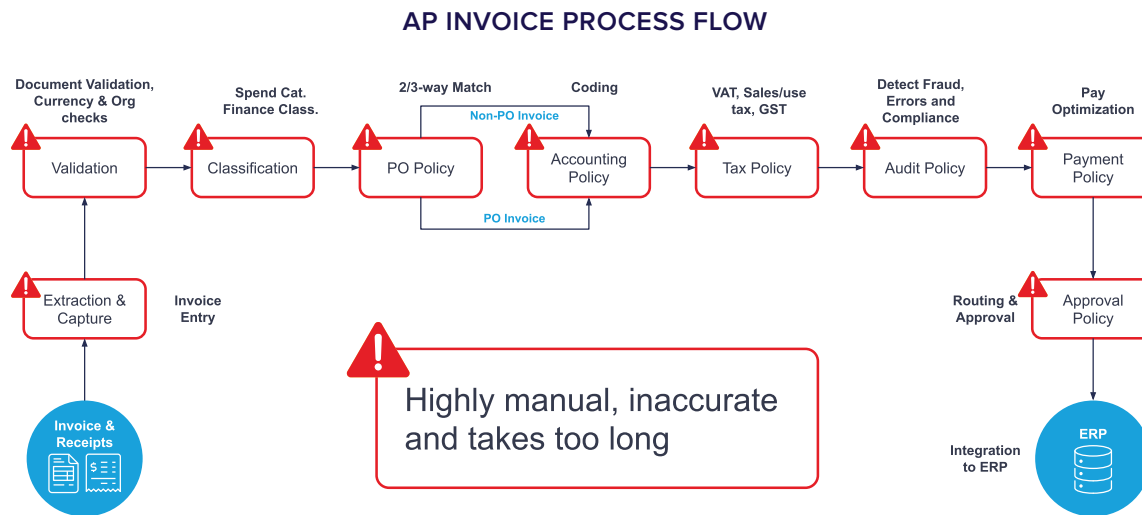
To unlock value from inefficient and predominantly manual finance back-office operations, employees and suppliers need to change the way they buy, invoice and pay for goods and services. Even the best finance automation software is not very effective if it's poorly adopted by users because they are unwilling or unable to use it in their day to day operations.

As a result, meaningful adoption takes several years of sustained change management, technology training, incentives, compliance mandates, and policy reinforcement – and pushes payback horizons for finance transformation efforts beyond many company's expectations. Further, many management teams have responded to the pandemic by de-prioritizing and de-funding big finance transformation efforts in favor of cash preservation, workforce planning, and business resiliency. A distracted workforce – still adjusting to the shifting realities and burdens of “work from home” and “school from home” – is even harder to bring along on a change management journey.

AP leaders face their own challenges

According to research by Ardent Partners, nearly 97% of AP organizations have been affected by the coronavirus crisis. Most aren't able to manage paper processes remotely, so staff, classified as "essential workers," have been going into the office at personal risk. Digital AP teams have moved more easily to working from home, but even they are unable to easily process all invoices. Hence, they are forced to prioritize invoices for strategic suppliers before others. They are facing resistance on plans to extend payment terms.

The challenges of operating during the pandemic have only compounded on top of the challenges they faced before it began. The AP invoice process has been and continues to be highly manual, inaccurate, and effort-intensive for most AP teams.



This leads AP teams to suffer from the following effects:

- inefficient and high cost of invoice processing (e.g. \$12-20 per Invoice)
- long cycle times and capture early pay discounts (e.g. 12-18 days to process)
- spend leakage due to duplicate and fraudulent payments
- inconsistent and unreliable invoice classification and accounting
- transactions classified as "miscellaneous" or "other" lacking granular visibility

What is Autonomous Accounts Payable “AP”



If the high manual effort at every step of the invoice process is the root cause of AP processing challenges, the solution can't just be about assisting in human decision making and automation of the minutiae. Fifty years of work on this have proven so. The only way to transform the process and overcome its challenges is to rethink it as an AI-driven process, in which AP teams only need to resolve exceptions while leaving the vast majority of invoices to be handled autonomously.

It's helpful to look at another domain where a similar transition is taking place — driving.

Many cars today have various driver-assist technologies, like adaptive cruise control, lane change warnings, and so on. These are great, and definitely make driving safer. But they aren't autonomous. Driving decisions are still 100% manual.

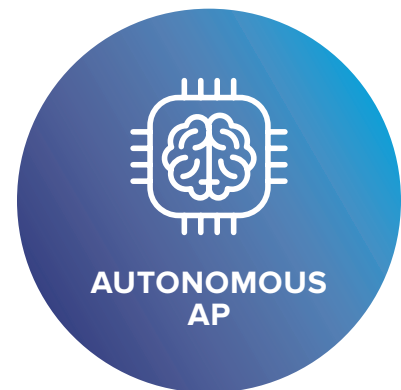
The driver still needs

- their eyes on the road
- their hands on the wheel
- to be ready to brake to a full stop immediately.

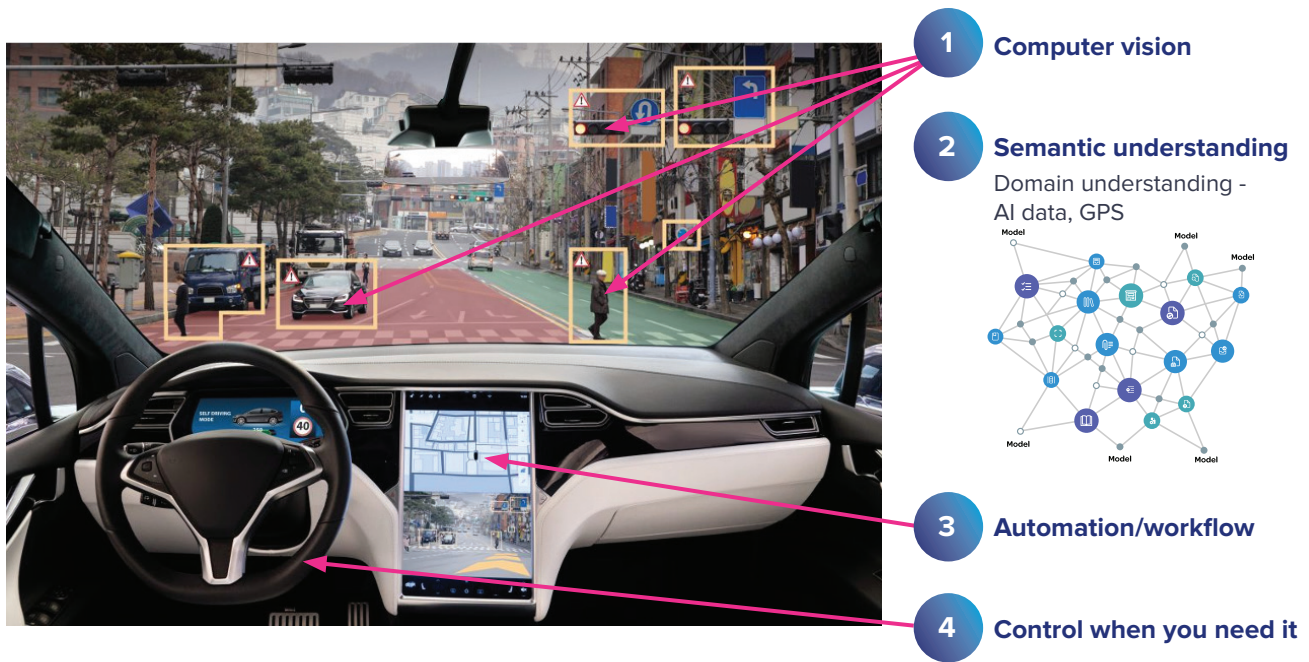
In other words, the driver still needs to devote their full attention to the task of driving.

Contrast that with autonomous cars.

1. computer vision sees the surroundings
2. next, AI understands what it sees, i.e. semantic understanding to make sense of it — distinguish a person from a sign from a car from a lane marker
3. automation and workflow to translate the situation to action, for example by weaving left and stopping to avoid hitting someone
4. if the AI needs human intervention by the driver, it prompts the driver to take charge and control the steering wheel



HOW AI MAKES AUTONOMOUS DRIVING POSSIBLE



Most of the time the driver doesn't have to do much at all. But, they can still take control when the AI isn't 100% confident.

Now, let's **apply the analogy of autonomous cars to Autonomous AP**, specifically invoice processing.

With Autonomous AP, the AI can do all the decision making for the majority of invoices. For the remaining invoices, AI can selectively engage human AP processors to give input on a few selected decision points.

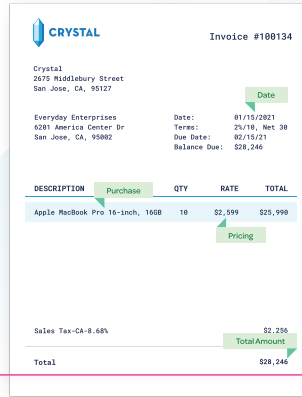
Autonomous invoice processing follows the same four steps:

- computer vision and other AI models to extract information from invoices
- semantic understanding to make sense of them and apply the right taxonomies — what is being bought, who is buying it, how should we classify and account for it?
- automation and workflow to autonomously process the invoice and assign next steps like a review or gather missing information
- workbench to provide AP teams control to review invoices where the AI isn't 100% confident

AUTONOMOUS INVOICE PROCESSING AND ITS KEY ELEMENTS

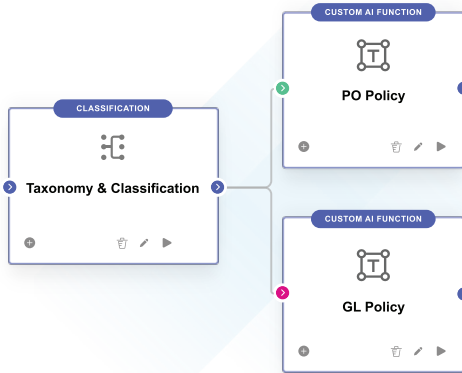
1 Computer vision

AI-based models that extract and can understand the content. Improve with every invoice



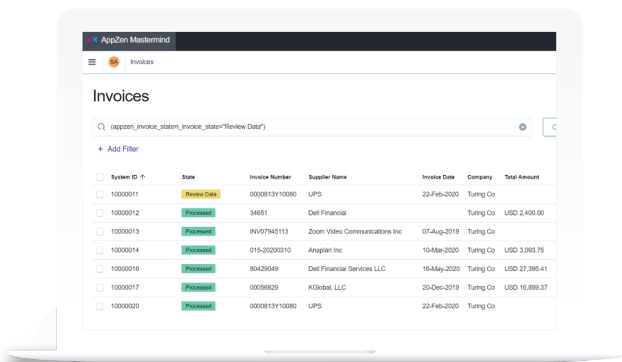
2 Semantic understanding

AI-based finance and accounts payable taxonomy that continues to get better



3 Automation/workflow

AI 1st automation platform to customize workflow, policies, and integrations to meet varied customer needs



4 Control when you need it

Workbench designed for AP staff to review invoices as needed and address exceptions

Autonomous AP has the same AI-driven capabilities already proven to be effective in autonomous driving, as illustrated by the table below:

AI-driven capabilities	Autonomous driving	Autonomous AP
Computer vision	Computer vision sees the surroundings e.g. roads, highways, people, objects	Computer vision extract information from invoices e.g. features, logos, numbers, text
Semantic understanding	Semantic understanding understands what is seen and distinguishes a person from a sign from a car from a lane marker, and understand their position, distance, direction, and relationships	Semantic understanding to make sense of the invoice, and apply the right taxonomies — what is being bought, who is buying it, which spend category does it belong to? how should we account for it- prepaid or operating expense, GL code, cost center?
Automation and workflow	Translate the situation to action, for example by weaving left and stopping to avoid hitting someone	Autonomously process the invoice and assign next steps like a review or gather missing information
Human control- when needed	AI prompts the driver to take charge and control the steering wheel	AP workbench to review invoices where the AI isn't 100% confident

Why Autonomous AP? Why now?



With an autonomous AP process, it's possible to make a dramatic impact on the amount of manual effort involved throughout the process.

With autonomous invoicing, the AI can extract, validate, classify, match, review and approve invoice documents and spend in real-time with minimal manual intervention. For most companies today, these invoice processing steps happen sequentially and take weeks. AI can accelerate these steps to a few hours and also audit 100% of invoices at the same time — a step that most companies defer until after payments are made.

Autonomous AP applications achieve this by automatically ingesting incoming documents from your AP email inbox or ERP/P2P system, applying the best AI, autonomously approving and posting most transactions, while selectively prompting your AP team to review any exceptions.

Autonomous AP applications should be able to autonomously process a majority (60-80%) of manual invoices end to end, with zero manual touches or reviews, with 100% confidence.

INCREASE AUTONOMOUS PROCESSING THROUGHOUT THE INVOICE PROCESS



Autonomous AP provides the following benefits for AP and P2P leaders

- achieve 60%+ end to end straight-through processing of manual invoices, with 100% confidence
- reduce the cost of invoice processing
- reduce the number of manual touches and increase efficiency by up to 80%
- compress invoice processing times to 2 days; capture early payment discounts
- generate savings of 0.1 - 0.3% across all third party spend annually
- 85-95% accuracy in extracting invoice data leading to lower errors
- 100% of spend is reviewed and audited on a real-time basis



Autonomous AP provides the following benefits for finance transformation leaders

- set the foundation for an Autonomous Finance back-office by achieving success in AP
- enhance supplier and employee experience by reducing invoice cycle time
- improve working capital by leveraging early payment discounts
- increase agility by empowering finance analysts to quickly configure complex processes
- \$8M+ in annual savings for a typical \$5B enterprise on invoice processing
- rapid time to value, with ROI starting in 3-6 months
- buyer and supplier friendly, as no supplier onboarding or invoicing changes required
- less IT resource-intensive as low code platform is accessible in the cloud



Autonomous AP provides the following benefits for finance teams and staff:

- reduce employee frustration by freeing-up time spent chasing documents, entering data
- enable finance staff to focus on strategic programs such as optimizing processes, business continuity, managing liquidity, regulatory compliance, stakeholder satisfaction
- empower AP staff to work with new-age technologies such as computer vision, AI, intelligent process automation, with great potential across all areas of finance
- empower AP staff to be part of the low code, no code technology adoption revolution in the finance and business back-office by working with the AppZen platform

Why implement Autonomous AP now?

Nearly 97% of AP organizations have been affected by the coronavirus crisis. AP teams that were reliant on manual processes have not been able to adapt to the new “work from home” reality. AP staff at these firms have been classified as “essential workers” who have had to go into their office to process invoices.

A recent CFO survey conducted by AppZen revealed that the majority of CFOs prioritize reducing manual activities and regret not investing enough in digital technologies such as AI:

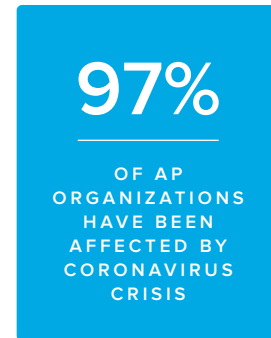
- **Goodbye manual processes:** Reducing manual, time-consuming processes was a priority for 90% of the executives.
- **Tech regrets:** The surveyed executives expressed regret for not investing more in advanced analytics, AI, blockchain, distributed ledger technology, machine learning, and robotic process automation five years ago.

Coming out of the pandemic, most CFOs do not want to go back to the pre-pandemic manual processes and are striving for the maximum level of automation possible, giving a strong tail-wind for Autonomous Finance and AP programs.

AP is the perfect place to accelerate your finance transformation. AP teams typically represent the biggest labor cost in finance. Further, the 15-35% of the company spend on indirect goods and services is typically under-managed by Purchasing and AP teams relative to direct spend. This means PO terms aren't always carefully observed, leading to savings leakage. Delays in invoice review and approval also lead to missed opportunities for taking early payment discounts.

The existing AP systems infrastructure is outdated. Research shows that most companies suffer from 35-60% of invoices that are manual or not PO-backed AI can easily automate invoice approval and accounting in real-time, alerting AP staff to only view exceptions and risks.

Autonomous AP delivers significant benefits in areas that finance automation technologies have failed to automate.



AUTONOMOUS INVOICING ACCELERATES JOURNEY TO WORLD CLASS AP

	Typical	AppZen can deliver
High processing cost per invoice	\$12.60 - \$21.19 / invoice	~ \$2.56 / invoice
Long invoice cycle times	10.8 - 25 days	~ 3.1 days
% of invoices processed “straight through”	21.2%	67.2%
Invoice exception rate	22.6%	~ 10.6%

Sources: Ardent Partners (2019), Ascend, IOFM, and AppZen

All of this adds up to big savings potential: for a typical \$5B revenue enterprise, autonomous invoice processing can deliver \$8M in annual savings, starting in 3-6 months, with little change management.

Start big or small with Autonomous AP led finance transformation



Not every finance transformation and AP leader can absorb a “go big” approach to transformation. The good news is that there are multiple ways to scope an autonomous AP project that can deliver early wins while setting the groundwork for larger-scale transformation to come.

Some common use cases are described below:

Customer use cases	Value drivers for the use case
1. All invoices	Happy with your P2P/ERP, but have no OCR or it sucks? Stop manually keying in invoice data and low extraction accuracy from using dumb OCR solutions.
2. Non-PO invoices	Long-tail of Non-PO invoices wagging the AP dept? Stop spending so much effort on non-PO tail spend. Most invoice volume is on low-dollar invoices, for which POs were never issued.
3. Leapfrog with autonomous invoicing	Is AP tired of touching invoices over and over? Numerous manual touches drive a high cost per invoice and long cycle times.
4. Invoice data extraction	Considering AP open heart surgery with P2P? Dealing with manual processes and legacy or unsupported software? Autonomous invoice processing avoids the delay, expense, and long payback of P2P investment.
5. Real-time spend auditing	Overpaying suppliers and stuck getting your money back? Address duplicate invoices, excess or fraudulent payments, improper vendor, and compliance verification – before you pay.

Solution requirements for Autonomous AP applications



Autonomous finance applications are purpose-built from the ground-up to address specific finance challenges (e.g. in areas such as AP, T&E). They are distinct from a superficial sprinkling of AI atop legacy on-premise and cloud finance software.

Finance transformation and AP leaders looking for genuine, AI-first autonomous AP applications should consider the following requirements:

1. Vision

Solution requirements

AI-driven processing reviews and approves invoices, and takes further action. Human intervention is only needed to resolve exceptions.

Required capabilities

- Enable clients to get to a high touchless % (63%+) on manual invoices fast (3-6 months)

2. Read, extract and validate data

Solution requirements

Use computer vision to read the vast majority of invoices.

Required capabilities

- Autonomously detect multiple PDF attachments on a supplier email, and uploads relevant invoice images
- Autonomously recognize multiple invoices embedded in a single PDF, and split them into multiple images
- Autonomously classify email text pre-faced inside an invoice PDF, separate the email and extract the invoice for review
- Autonomously remove background noise, shadows, and poor contrast on invoice images prior to extraction
- Autonomously extract all features accurately from an invoice using feature-specific AI models and augment them with AppZen data
- Autonomously extract invoice data across all your suppliers, without creating/ maintaining supplier-specific templates
- Autonomously recognize supplier logos with computer vision and use them for validation
- Autonomously extract and predict a supplier's legal entity based on the parent name, "billing name", "doing business as" name, address and logo
- Autonomously validate extracted supplier features with a customer's vendor master by intelligently assigning higher weights to features appearing in the vendor master

3. Semantic understanding

Solution requirements

Understands content and context. AI-based finance and Accounts Payable ontology and taxonomy that continues to get better.

Required capabilities

- Semantically understand invoices by using augmented supplier data, customer spend categorization, historical classification data, and AppZen's taxonomy classification models
- Use deep taxonomy classification models that have domain ontologies built by using deep learning models on authoritative public sources (e.g. use Supreme Court judgments on IP Law to classify legal invoices)
- Autonomously predicts the spend category and accounting treatment, e.g. pre-paid or operating expense

4. Predicting GL account segments

Solution requirements

Predict the GL account code, cost center, project, product, and location using Semantic understanding and historical classification.

Required capabilities

- Autonomously predict and assign up to 10 GL account segments based on semantic understanding (akin to a smart human accountant) and assignment history
- Autonomously derive correlations about supplier and buyer transacting patterns, e.g. "billing address" on supplier invoice is correlated with a specific buyer cost center

5. Non-Compliance detection and audit

Solution requirements

Find issues in invoice and AP spend such as duplicates.

Required capabilities

- Autonomously determine if a non-PO invoice requires a PO, based on the purchasing policy (e.g. category, supplier, value threshold, history et al)
- Autonomously aggregate spend across multiple invoices from the same supplier and compare to PO approval threshold
- Autonomously audit 100% of invoices proactively prior to payment and flag duplicates across both invoice and T&E receipts

6. Self Correcting AI

Solution requirements

Improves itself over time without much effort from the team.

Required capabilities

- Autonomously self-correct cross-customer AI models based on customer-specific history and user feedback loop

7. AI-first Process Orchestration

Solution requirements

Allow customers to tailor the process to their own business needs easily, efficiently, flexibly.

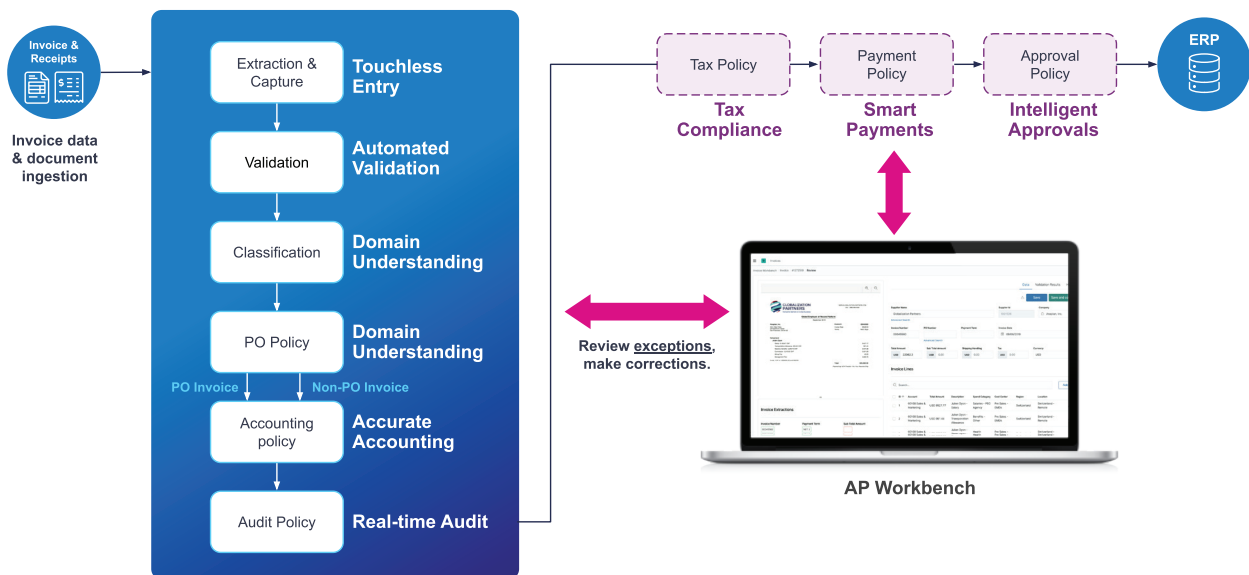
Required capabilities

- Automatically supplement predicted values with any special customer rules using the MasterMind IPA, e.g. classify invoices for immigration services to the cost center of the applicant

Overview of AppZen Autonomous AP

AppZen Autonomous AP is a complete, AI-first solution that provides autonomous processing for all stages of invoice processing, including invoice ingestion, data extraction, and capture, validation, classification, PO policy, accounting policy, audit policy leading through to posting to ERP.

OVERVIEW OF APPZEN AUTONOMOUS AP: AI-DRIVE INVOICE PROCESS



AppZen Autonomous AP is unique due to its focus on providing “fully autonomous” processing, computer vision and semantic understanding, non-compliance detection, and self-correction.

AppZen Autonomous AP differentiation

Fully autonomous

- AI-driven processing reviews and approves invoices, and human intervention is only needed to resolve exceptions
- Enable clients to get to a high touchless % (63%+) on manual invoices fast (3-6 months)

Computer vision and semantic understanding

- Purpose-built for reading, understanding, and classifying invoices, and predicting GL account segments - for all, but especially manual invoices for indirect spend

Non-compliance detection

- Compare invoice to purchasing policy and approval thresholds
- Works for all invoices but especially valuable for non-PO invoices
- Audits 100% of invoices prior to payment and flags duplicates across invoice and T&E receipts

Self-correction

- Cross-customer AI models based on customer-specific history and user feedback
- Works with Mastermind intelligent process automation platform to add special customer rules to predictions and extend any AP or Finance process

Case Study: Software Industry Customer

At a glance

- Provides software for finance teams to model complex scenarios and forecast continuously
- Processes 12,000 invoices yearly in Workday with 2 AP clerks

Challenge

90% of invoices get processed manually. Company attempted to automate end-to-end invoice processing automation with RPA vendors, but found it could not scale to every supplier and scenario

Solution

Autonomous AP extracts, codes, and validates invoices autonomously before handoff to P2P and ERP

Benefits

Autonomous AP gets most invoices from extraction to "ok-to-pay" with no human intervention, so the focus can be on the problematic exceptions

Achieved:

- 100% autonomous image upload
- 69% autonomous extraction
- 76% autonomous PO matching
- 90% autonomous policy validation
- 100% autonomous upload to ERP

AppZen Autonomous AP is helping leading finance organizations achieve AI-driven back-office processing, with 69% to 100% autonomous processing across stages.



About AppZen

AppZen is the leader in Finance AI software, empowering autonomous finance operations for modern finance teams. Our patented artificial intelligence software accurately and efficiently processes information from thousands of data sources so that organizations can better understand internal spend and make smarter business decisions. It seamlessly integrates with existing expense and accounts payable workflows to read, understand, and make real-time decisions based on your unique spend policies, leading to faster processing times and fewer instances of fraud or duplicate spend. Global enterprises, including one-third of the Fortune 500, use AppZen's Expense Audit and Autonomous AP products to replace manual finance processes and accelerate the speed and agility of their businesses. To learn more, visit us at www.appzen.com.

APPZEN.COM