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# SUPPLY CHAIN FINANCE IN THE TRENCHES

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# Safeguarding the Greater Good

Ethics is the compass that guides individuals and organizations toward responsible, morally upright conduct.

**By Richard T. Brady, CMA, CGFM, CDFM**

Enron, WorldCom, Lehman Brothers, Madoff Investment Securities, FTX—all famous names in business and all for the wrong reasons. To a greater or lesser extent, each of these businesses were failures due to some accounting and ethical component.

Ethics serves as the bedrock upon which every profession must be built. It's the compass that guides individuals and organizations toward responsible and morally upright conduct. In any field, be it medicine, law, education, finance, or accounting, ethics ensures that practitioners prioritize the well-being of the profession and society over personal gain.

Ethical standards foster trust among professionals, clients, and the public, leading to healthier and more sustainable professional relationships. Further, they help maintain integrity, promote fairness, and prevent exploitation or harm. Without a solid ethical foundation, professions risk eroding their credibility and damaging individuals and society at large. In essence, ethics isn't only the cornerstone of any profession but also a safeguard for the greater good while supporting sustainable business management.

The ethical foundations of accounting are rooted in principles that uphold transparency, integrity, and responsibility. At its core, accounting serves as a critical tool for financial reporting, guiding stakeholders' decisions and fostering trust in the business world. Ethical accountants are guided by key principles such as honesty, objectivity, and professional competence. They must provide accurate, complete, and unbiased information, ensuring that financial statements fairly represent a company's financial health.

All IMA® members are required to abide by the *IMA Statement of Ethical Professional Practice*. While specifically developed for IMA members to guide their conduct, the principles and standards outlined in the IMA Statement serve as a blueprint that all accountants can follow to maintain ethics in management accounting. IMA's ethical standards compel members to uphold the standards of competence, confidentiality, integrity, and credibility. Greater adherence to these standards can mitigate the risk of—or even outright prevent—accounting scandals.

To ensure that ethics remains at the forefront of our profession, IMA will be celebrating Global Ethics Day 2023 on October 18. This is an annual moment to empower ethics through the actions of individuals and organizations. In the run-up to and on October 18, schools, businesses, institutions, nonprofits, individuals, and IMA members are encouraged to share plans and activities celebrating Global Ethics Day on social media using #GlobalEthicsDay and #EthicsEmpowered.

The accounting profession is underpinned by a commitment to ethics and integrity. Accounting scandals serve as powerful cautionary tales, reminding us of the devastating consequences of ethical lapses in accounting practices. Upholding ethical principles and standards is not only a moral imperative but also crucial for maintaining the trust of stakeholders and the stability of the global economy. Ultimately, the importance of ethics in the accounting profession can't be overstated, as it serves as the foundation upon which financial trust and accountability rest.

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CMA®

IMA's Certification for Accountants and Financial Professionals in Business

# Welcome, New CMAs: August 2023

1,083 IMA members became CMAs between August 1 and August 31, 2023.

**By Ella Suponitskiy, CMA, CPA, CAE**

For more information on CMA certification, visit www.imanet.org/cma-certification.

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Xuemei Zhuo
Kartik Zibbu
Fangxing Zou
Qiong Zou
Qunying Zou
Wei Zou
Yong Zou
Shuyan Zuo

STRATEGICFINANCE

# What Young Workers Need Leaders to Hear

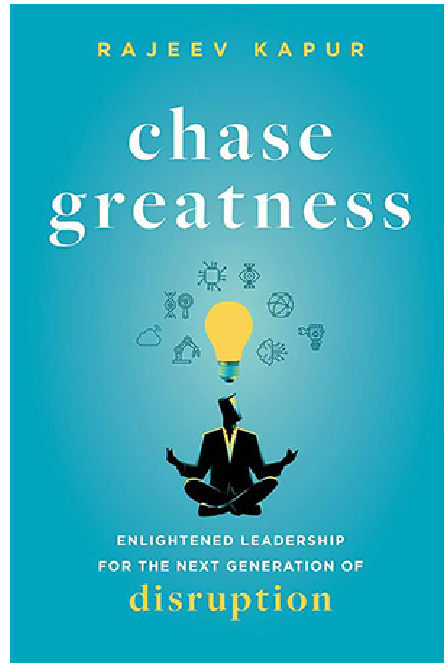
Early-career professionals have high expectations for their employers, and it requires leaders to refine their approach to succeed.

**By Lauren Robichaud, CMA**

We've all likely heard the well-worn sayings time and time again, "If it ain't broke, don't fix it," and, better yet, "Let's not reinvent the wheel." *In Chase Greatness: Enlightened Leadership for the Next Generation of Disruption*, author Rajeev Kapur seeks to dispel that type of mentality among business leaders and introduce them to the theory of enlightened leadership.

Kapur weaves current events, historical examples, statistics, and his own personal experiences to make and support the argument that the business environment is changing and leaders have the choice to adapt to it or remain stagnant. The premise of Kapur's book revolves around the growing influence of younger generations, most notably Millennials, who currently compose 39.4% of the workforce, and Gen Z, who will compose approximately 30% of the workforce by 2030 as more than 10,000 Baby Boomers are reaching the age of 65 per day, according to Johns Hopkins University.

With this transition will come a wave of changes, as younger generations possess values and expectations that are different in significant ways from workers of the past. Above all else, these generations expect equality of advancement opportunities, participation, transparency, diversity, equity, and inclusion from their leaders, and they won't hesitate to walk away from a company if their leaders don't communicate their values effectively and practice what they preach.




In the past, leaders may have been able to follow a profit-centric approach. However, younger generations require leaders to focus on the triple bottom line—profit, people, and the planet—being mindful of the environmental, social, and governance implications of the business in addition to the financial aspects. These generations who are students or in the early stages of their career cite "resistance to change" as a top reason why they don't have confidence in leadership figures, and therefore Kapur makes the argument that embracing change is without a doubt the most important leadership competency for an enlightened leader to possess.

The book offers thoughtful insights, highlighting the need for adaptation and the adoption of new styles of leadership within the C-Suite and across management teams. The different components of enlightened leadership are then broken down one by one, with suggestions for successful implementation and a discussion of potential workplace benefits. Each chapter ends with a succinct leadership lesson and thought-provoking questions, which can help leaders to drive action, efficiency, and improved morale within their organization. I view this book as valuable for aspiring and current leaders to read and reflect on to improve their leadership skills and determine whether they're doing enough to attract, retain, develop, and mentor young talent.

As a member of Gen Z and someone who recently began my own corporate accounting career, I found myself nodding my head in agreement with Kapur throughout the book as he mentioned what people of my generation are looking for in an employer. One point in the book that's crucial for leaders to recognize is that to younger generations, a job isn't merely a job. Most of us are purpose-driven individuals, energized by sustainability-focused organizations that adopt a mission beyond the profit motive and help employees to feel as though our work has a larger purpose and makes a positive impact on all stakeholders. To many of us, profits and purpose must move in tandem with one another, and if leaders embody this thinking and prove to us—not just with their words but also with their actions—that they're aligned with our vision for what a company and leaders should be, then they'll likely garner a long-term commitment from us for them and the organization as a whole.

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# Cultivate Diversity of Thought

Leaders must approach diversity from an ethical perspective and make efforts to attract and retain talent that thinks differently.

**By Passard Dean, DBA, CMA, CSCA, CFE, CIA; Tayhana Taylor; and Amanda Laura, CMA**

Age, race, ethnicity, culture, gender, and sexual orientation are only some of the types of diversity that exists in today's environment. There's also diversity in religion, disability, education, and socioeconomic background. If an organization's leaders genuinely desire diversity, equity, and inclusion (DE&I), they must scrutinize their approach to achieving DE&I goals from an ethical perspective. The efforts of ethical leaders include thinking about an organization not only from a bottom-line standpoint but also trying to maximize the success of each employee, the value it provides its customers and other stakeholders, and its responsibilities to the community.

## Diversity of Thought Challenges the Status Quo

Diversity is important: There's much to be gained from individuals from different backgrounds working together and sharing their various perspectives to accomplish an organization's desired goals. Generally, diversity can help teams glean insights by working through healthy conflicts that should result in new ideas and progress. Additionally, diversity of thought elevates teams by encouraging active communication based on individuals' different perspectives. Diversity of thinking also creates an attitude that goes beyond any individual to foster improvements in organizational culture. Encouraging diversity of thought is an ethical imperative that sparks honest conversations, leading to increased innovation and better strategy execution.

Often the types of diversity that get the most attention are racial, gender, or ethnic diversity. While it's essential to have these types of diversity, the optics often are more important to decision makers than the goal of having a truly diverse team. A team can be composed of an ethnically diverse group of individuals, but if all or most of them have similar opinions, it won't provide for healthy debate over conflict that leads to progress.

One way for organizations and teams to get the most benefits from diversity is to let go of the mindset that there's only one way to get things done. Forming teams and equipping organizations with individuals from different backgrounds who think diversely will help reveal novel insights that may only be generated by this type of diversity. For organizations to truly take advantage of the potential benefits from diversity of thought, leadership needs to create an inclusive culture and encourage workers with a range of perspectives to share their ideas. Leadership will also need to listen to these various ideas with a willingness to see what benefits may be attained by thinking differently.

If teams consist of individuals with similar points of view who tend to behave similarly, it could hinder their decision-making ability. They may arrive at a result or solution more quickly, but there may be better solutions given the lack of healthy disagreement, which diversity of thought infuses. Therefore, grouping individuals who think differently in these teams will fuel better decision making that should benefit the organization.

Diversity is much more than gender, race, or the color of a person's skin. It's more important to consider how team members think. When leaders realize that each individual brings different attributes and experiences to the table, and views and thinks about issues differently, it will be a tremendous asset to their organization.

## Diversity during the Hiring Process

When considering diversity during the hiring process, it's ethically imperative that hiring managers consider the underlying qualifications that will put individuals in the best position to succeed in the organization and contribute to its success. Therefore, while diversity is essential, hiring managers must remember that fundamental qualifications are imperative.

Given a pool of candidates with those qualifications, hiring managers should consider the best way to increase the organization's level of diversity. Hiring managers should be thinking about the following questions before targeting candidates from specific racial, gender, or ethnic groups.

Do we need someone with an undergraduate or graduate degree in accounting or a related discipline?

- Does the person need to have excellent communication and interpersonal skills?
- Does the person need to be adaptable and willing to embrace change?
- Is attention to detail an essential characteristic?
- Does the person need to have experience in data analysis and analytics?
- Is experience in the industry imperative, or can the person be trained or learn on the job?
- Does the individual need to be creative, a problem solver, or both?

After questions like these have been answered, the hiring manager can think about how diversity of thought and other forms of diversity will play a role in selecting which candidate should be extended an offer. Depending on the position's responsibilities, diversity of thought and all it entails can play a much more significant role than other forms of diversity. For certain departments such as marketing, the organization may want to prioritize candidates from diverse backgrounds who think differently from the current team, provided that each individual has most of the essential qualifications, such as relevant experience.

The hiring process should include an assessment to identify applicants' behavioral tendencies or inclinations to gauge whether they'll not only add diversity of thought to the team but also other forms of diversity that would enhance the quality of the team. For example, if the organization has a goal of establishing a presence in a new country, it would be wise to hire someone who has the fundamental qualifications in terms of skills and experience and who is also from that country or has lived in that country. There's a high probability that this individual's knowledge of that country's culture and customs will help team members to think about strategic and tactical planning differently.

## Think Differently

When organizations adopt a policy of cultivating diversity of thought, it will empower and motivate individuals, as they'll likely feel that they belong to a more inclusive environment, which may lead to them being more productive workers. Conversely, when organizations choose to refrain from factoring diversity of thought into their hiring process, it may result in a limitation of the organization's growth, as it won't have the benefit of a variety of perspectives, especially when creating strategic plans.

For an organization to continue to be impactful and profitable over the long term, it's imperative that leadership provide employees with opportunities to challenge the organization through diversity of thought, which should bring new ideas—and new ways of looking at old ideas—to the table.

Organizations that make diversity of thought a priority provide employees with opportunities to think about various perspectives and contribute to projects and the overall success of the organization in ways that couldn't happen otherwise. Tapping individuals who are more creative and imaginative to work with those who are more analytical and detail-oriented fosters cognitive diversity.

Other types of diversity heavily influence diversity of thought, and that's because people's thought processes are influenced by our cultures, ethnicity, education and training, socioeconomic status, age, political affiliation, religion, experiences, and skills. When all these factors are considered from an ethical perspective, management accountants and finance leaders can genuinely increase their organization's diversity, set an ethical tone at the top, and improve its strategic planning and execution.

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# Green Score and Corporate Sustainability

This new metric captures a company's investment in green human capital based on green skills required in its job postings.

**By Alper Darendeli, Ph.D.; Kelvin K.F. Law, Ph.D.; and Michael Shen, Ph.D.**

More companies than ever are now proudly announcing they're carbon neutral or net zero. Yet July 2023 marked the hottest month in the world's history. This disconnect between corporate claims and climate reality raises the unavoidable question: Are many corporate sustainability claims simply greenwashing?

For years, various types of environmental, social, and governance (ESG) ratings have been used to evaluate companies' environmental efforts. But these traditional ratings are known to result from subjectivity and are prone to corporate greenwashing, the practice of making unsubstantiated environmental claims, or even more recently, greenhushing, the practice of downplaying environmental claims for fear of being accused of greenwashing.

We conducted a study that recognized the limitations of traditional ESG ratings and introduced a novel measure, Green Score, to provide a more action-based, objective barometer to measure companies' environmental efforts. Green Score is a metric that leverages companies' demand for green skills in job advertisements to provide a more credible evaluation of companies' environmental efforts.

## What Is Green Score?

Green Score captures an organization's investment in green human capital, which is a set of employees' knowledge, skills, and abilities related to environmental protection and green innovation. It's computed based on the concentration of green skills—environmental-related skills (e.g., environmental science, hazardous waste handling, and water treatment skills)—required in companies' job advertisements. Using job advertisements to compute Green Score offers a dynamic way to capture companies' evolving investment in green human capital.

Organizations need people with green skills to execute environmental and sustainability initiatives. For each job advertisement, the Green Score per job is simply the percentage of the required skills classified as green skills. Averaging the Green Score of all of a company's green job advertisements results in the organization's overall Green Score. Green Score focuses on job skills rather than job titles because the former offer a more accurate evaluation of a company's true commitment to improving its environmental performance.

## Green Score and Profitability

Our study examined whether Green Score predicts organizations' future profitability, and analyses showed a clear connection between the two. The economic impact is also substantial: A one standard deviation increase in a company's Green Score is associated with a 3.8% rise in its median return on assets.

By using DuPont analyses, which breaks down a company's profitability into its constituent parts, allowing for a more comprehensive understanding of its financial performance, the study found that the improvement in profitability primarily comes from an increase in revenue and net profit margin among companies that invest more in green human capital. The increased investment helps organizations to develop more environmental-related products and services or even high-quality, well-cited green patents that eventually boost companies' competitiveness. These companies are better at meeting customer demands for sustainability and earn higher premiums for their products and services.

Traditional ESG ratings, unfortunately, don't necessarily predict future profitability like Green Score does. Only green new hiring through Green Score sufficiently captures companies' genuine environmental efforts that pay off in terms of product differentiation, innovation, and, ultimately, profitability.

## Green Score vs. ESG Ratings

Traditional ESG ratings typically rely on claims made by companies in their annual reports, press releases, or sustainability reports. Hence, it's no surprise that these types of voluntary disclosures are prone to greenwashing because companies can overclaim their environmental assertions through selective reporting. Green Score by design is less likely to be affected by these hurdles because what organizations do is more informative than what they say.

Green Score is computed based on an organization's numerous job advertisements across different job positions and functions. Because it's very difficult for companies to manipulate job advertisements, the measure provides an almost real-time, forward-looking indicator of corporate investment in green human capital. Unlike traditional ESG ratings that scrutinize past initiatives, Green Score signals whether companies are building environmental sustainability through strategic new hiring.

Green Score is a more transparent and dynamic metric than a traditional ESG rating, which is more susceptible to corporate greenwashing. Green Score is based on green human capital investment that traditional ESG ratings typically overlook.

## Practical Implications

Our study found that companies tend to be passive in their green human capital investment, and negative environmental incidents are the usual trigger for companies to improve their Green Score. This fact opens up several potential practical applications for practitioners. The standardized nature of Green Score allows companies in different industries to directly compare and benchmark their investment in green human capital. The gap between Green Score and traditional ESG ratings also reveals which companies are greenwashing instead of genuinely investing in environmental efforts.

Corporate managers should focus on creating green jobs with a higher concentration of green skills, instead of merely creating other green jobs. The fact that Green Score focuses on green skill concentration means that it can help managers better understand if their green new hiring is pumping up head count or genuinely boosting green human capital. Considering the gap of Green Score in companies' job positions provides valuable insights on their recruitment strategies, talent retention policies, and business strategies.

This research study introduced a novel, action-based metric that reveals a company's investment in green human capital generally overlooked in traditional ESG ratings. Green Score affirms again the conventional wisdom in ESG research: Companies could do good and do well at the same time because their environmental efforts are strongly linked to future profitability and corporate innovation.

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# Embracing the Flexible Staffing Model

Flexible staffing can help organizations gain access to specialized skills, save costs, and reduce burnout.

**By Steve Saah**

After a period of prolonged inflexibility—the result of the COVID-19 pandemic and its restrictions—we're seeing a new era of flexibility taking hold in the workplace. That isn't just due to the rise of flexible work arrangements like hybrid work. The embrace of a flexible staffing model by many employers is another factor.

During the pandemic, a flexible staffing strategy helped countless organizations pivot with agility whenever their talent needs turned on a dime. It allowed them to bring in contract talent for as long as needed to alleviate staffing and skills gaps and keep high-priority projects on track.

Now, organizations are realizing this strategy has staying power and can be used anytime to help ease the burden on their core teams. And for ongoing challenges and requirements, they can opt to engage contract professionals for full-time roles. In either case, flexible staffing creates many benefits for busy finance and accounting departments—especially those grappling with staffing and skills gaps.

Recent research from Robert Half found that two-thirds of hiring managers in finance and accounting seek to hire talent for new roles, while 32% are focused on staffing vacated roles. Yet 95% of these managers also said they face challenges finding skilled talent available for hire. So it's no surprise that other research found that 64% of hiring managers in finance and accounting expect to bring in more contract workers in the months ahead.

If you're considering bringing in highly skilled contract talent to work alongside your permanent staff, here's a look at some of the top advantages you can realize from this move.

**Increased access to in-demand talent and specialized skills.** One key benefit of using a flexible staffing approach is that it opens the door to connecting with skilled talent located anywhere.

Professionals who work on a contract basis often choose this path because they enjoy the challenge and opportunity of lending their abilities to diverse assignments for various employers. You can find professionals who can work remotely or on-site, and you can hire individuals or entire teams, depending on your business needs.

The array of skills and experience you can choose from when hiring finance and accounting talent on a contract basis is also deep and broad. For example, you can align specialized knowledge, such as in a particular area of accounting or an industry, for a new business initiative. You can also connect with professionals who have in-demand credentials such as the CMA® (Certified Management Accountant).

Depending on the talent resource you work with to secure contract talent, you might also have the option to bring in the same contract professionals on a recurring basis, such as for cyclical projects.

**Reducing costs.** There's a perception that hiring contract professionals is a luxury and only reserved for employers with big staffing budgets. But this talent is accessible to organizations of any size. Plus, hiring contract professionals allows you to turn some of your fixed personnel costs into variable expenses because you pay only for the talent you need—when your business truly needs it.

Additionally, when you use a flexible staffing model, it can help you to reduce the high costs associated with hiring and training new staff while also keeping your overtime expenses in check.

**Improved competitive position.** When you adhere to a rigid labor structure, it can make your business more vulnerable to economic highs and lows. Many employers discovered this the hard way during the pandemic. They were less agile, and thus, couldn't respond quickly to disruption.

A flexible talent model enables you to staff strategically as demands fluctuate, so your business can respond to change faster and more seamlessly. This can give you an advantage over competitors trying to stick with a more traditional staffing approach despite evidence that most work environments are in a period of transformation.

**Retaining valued talent.** In a recent Robert Half survey, 41% of finance and accounting professionals in the United States reported that they're either looking for a new job right now or planning to launch their search soon. So, if you're overloading your team, you could be at risk of hastening the departure of valued employees already contemplating making a move.

Bringing in contract professionals during high workload periods can help ease the burden on your team and stave off potential burnout. And if you engage interim talent to assist your staff with day-to-day responsibilities, your core team can focus their skills and attention on high-priority challenges. That can help them to feel more motivated and engaged on the job—and less likely to eye the exit door.

**Avoiding costly bad hires.** In a market where the unemployment rate for accountants and auditors is just 0.9%, according to recent figures from the Bureau of Labor Statistics, it's critical for employers in hiring mode to snap up in-demand candidates quickly. But moving too fast amid a talent crisis can result in bad hires. This can take a financial toll on your business, as well as dent your team's morale.

By supplementing your finance and accounting teams with contract talent, your business can maintain optimal productivity while you search for permanent hires. You might even discover that the contract professionals you've engaged are strong contenders for full-time roles you're trying to staff. The contract assignment provides an opportunity to "audition" a potential new hire, providing you with insight into how they work and mesh with your company's culture.

Maintaining flexibility in your staffing approach will allow you to scale your workforce elastically and cost-effectively meet the challenges of today's rapidly changing business landscape.

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# Accounting Ethics and Cybersecurity

Finance leaders who collaborate with cybersecurity personnel increase their organization's effectiveness in dealing with cyber threats.

**By Daniel Butcher**

Management accounting and finance professionals have a role to play in establishing agile cybersecurity response plans that effectively balance the need for transparent communication with shareholders, customers, regulators, and law enforcement while adequately protecting the company. These plans need to explicitly consider responses to cyber threats such as password sharing, phishing, social engineering, malware, and ransomware. In the case of the latter, senior leaders must weigh the pros and cons of paying a ransom to attackers, both the immediate impact and long-term consequences, according to Nick Seaver, cyber risk partner at Deloitte.

A related ethical issue is collecting and analyzing personal and sensitive information only to the necessary extent and where there's a legitimate purpose for the benefit of the company. This includes considering how to protect the collected data, manage it with third parties, and protect individuals' rights to be forgotten and to privacy in some jurisdictions, Seaver notes.

Ensuring that network monitoring activities are proportional to the risks and are conducted with a well-defined and legitimate purpose, such as detecting insider security threats or ensuring policy compliance, has an ethical component to it as well. Seaver says to consider whether you need to communicate the purpose and extent of monitoring to employees, how to monitor computer usage in a fair and unbiased manner, how to avoid practices that could lead to discrimination or unjust treatment of individuals, and how to balance the need to monitor network activity to protect the company with respect for employees' privacy rights.

It's important to conduct responsible ethical hacking assessments to identify and address potential weaknesses in information systems and networks with the appropriate consents and in compliance with relevant laws and regulations. In addition, it's vital to notify affected parties of any vulnerabilities in a timely and responsible manner and consider how long they need to address the issue before public disclosure for the greater good.

It's often necessary to make ethical decisions when responding to cyberattacks, such as whether to engage in active defense measures, share information with law enforcement, or negotiate with attackers about ransom payments. The potential consequences and legal implications of each decision should always be considered.

"Research vulnerabilities and develop exploits, ensuring that the discovery and development are conducted ethically, with a focus on enhancing security and minimizing potential harm to individuals, organizations, and critical infrastructure," Seaver says. "Balance the need for sharing knowledge to improve security while avoiding intentionally or inadvertently allowing malicious attackers access to high-risk exploits."

## Ethics and Cybersecurity Go Hand in Hand

Addressing potential security risks posed by employees or contractors, aka insider threats, in an ethical manner, respecting privacy rights while implementing necessary controls, and monitoring measures should all be on a professional's checklist. Other considerations include balancing network monitoring so activities are proportionate to the risks to the company and deciding whether employees need to be informed of the monitoring, Seaver says.

"Conduct authorized security assessments and penetration tests, ensuring that these activities don't inadvertently cause harm, violate legal guidelines, or infringe upon the rights of system owners and users," he says. "Decide when and how to disclose discovered security vulnerabilities while considering the potential risks and benefits, such as providing affected parties time to patch [them] before public disclosure and the possibility of malicious hackers exploiting the vulnerability once disclosed."

Cyber incidents and responses can have severe financial implications, including operational disruption, regulatory fines, and reputational damage. The ethical challenges faced by cybersecurity professionals in managing incident response and disclosure are also relevant to finance teams, which need to consider the financial impact of a cyberattack and make difficult decisions around uncomfortable aspects of cyberattacks such as ransomware payments, Seaver notes.

"The finance function typically handles sensitive financial information and needs to work with cybersecurity professionals to ensure it's adequately protected, including personal data privacy considerations and regulatory compliance," he says. "The finance function is particularly susceptible to insider threats and fraud, which could lead to significant financial losses or reputational damage."

Finance and cybersecurity professionals need to work together to address these risks ethically and effectively, aligning with the CFO's responsibility to maintain financial integrity and safeguard the company's assets. CFOs are responsible for managing financial risks, which includes agreeing on resources for cybersecurity investments. Cybersecurity professionals need to work with the CFO and other accounting and finance professionals in prioritizing risk mitigation investment decisions that balance security, risk reduction, and budgetary constraints.

## Professionals' Ethical Obligations

Adhering to the highest standards of professional integrity and honesty, avoiding conflicts of interest, and reporting any unethical activities or security breaches promptly and accurately form an ethical foundation for management accountants and cybersecurity professionals alike, Seaver says. Be transparent with senior management about potential risks and vulnerabilities within the organization.

Another important obligation is helping to safeguard sensitive information, including client data, and ensuring that the organization has controls to prevent unauthorized disclosure, modification, or access. Organizations must respect the privacy rights of colleagues, clients, and the public, and adhere to industry-specific regulations and standards.

"Foster a secure environment within the organization by implementing robust security measures, learning from cyber incidents or near misses, and promoting a culture of security awareness and ethical behavior among colleagues," Seaver says.

Companies should continuously develop and maintain professional cybersecurity expertise and stay informed about emerging threats, vulnerabilities, and best practices specific to the industry, he says. It's also important to share this knowledge with colleagues as appropriate to help strengthen the organization's security posture.

"Act responsibly when discovering security vulnerabilities, adhering to responsible disclosure guidelines, and work with affected parties to address an issue before publicizing it," Seaver says. "Balance the need for strong security measures with the ethical obligation to respect individual privacy rights, avoiding overly invasive surveillance or monitoring practices."

## Cultivating an Ethical Culture

Finance leaders can set the right tone by emphasizing the importance of ethics and cybersecurity and demonstrating commitment through their actions and decisions. This includes allocating appropriate resources to cybersecurity initiatives and adhering to cybersecurity policies.

"Visibly participate in organizational cyber training and education, encouraging collaboration between accounting/finance and cybersecurity professionals, and foster a cross-functional understanding of ethical challenges, cybersecurity risks, and cyber budget challenges," Seaver says. "Foster an environment of open communication where employees feel comfortable discussing ethical dilemmas, reporting potential security incidents, and sharing ideas for improvement."

A key part of cyber training and education is encouraging employees to report cybersecurity concerns and ensuring that reports are taken seriously and addressed promptly. Also, rewarding employees who exemplify ethical behavior and contribute to the organization's cybersecurity efforts can strengthen an ethical culture.

"A strong culture of ethics as it relates to cyber can absolutely increase an organization's level of cybersecurity," Seaver says. "While having robust technical defenses in place is essential, in cybersecurity, more often than not, humans are the weakest link."

When employees are committed to ethical behavior, they're more likely to follow good cybersecurity practices such as not sharing passwords and spotting phishing emails, report potential security concerns, and take a proactive approach to protecting the organization's assets and reputation. This, in turn, can help to reduce the likelihood of security incidents and minimize the potential impact of any breaches that do occur.

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STRATEGIC FINANCE


# Reaping AI Benefits on a Budget

Even small businesses can leverage AI tools to augment what their staff accomplishes, cut costs, and achieve strategic objectives.

**By Ahmad H. Juma'h, Ph.D., CMA, CPA, and Logan Arumugam, CMA, CSCA, CFM, CPA, ACMA**

Growth and profitability opportunities for small and medium-size enterprises (SMEs) using AI far exceed the challenges. According to a recent Constant Contact survey, 91% of SME respondents using AI said it has made their business more successful and 28% said they expect it to save them $5,000 or more in the coming year. The business environment is technologically growth-oriented, as the performances of the AI giants have shown via the recent stock market moves and valuation increases. SMEs play a vital role in the global supply chain and need to take advantage of AI to achieve return on investment (ROI) and their business goals.

Programmers and developers use various tools like machine learning models, natural language processing, computer vision, and neural networks to create AI algorithms. Today, generative AI systems respond to user queries by generating content. AI impacts SMEs' productivity and efficiency by enabling automation and enhancing the workforce's speed and decision-making processes. SMEs' most common uses of AI are in data analytics tools, automating tasks and creating content using generative AI applications such as ChatGPT and Bard.

The aspects of SMEs' business processes that can benefit from AI are growing as the technology continues to evolve. Additionally, SMEs that have adopted AI can respond more quickly than competitors to take advantage of strategic opportunities and avoid or mitigate potential risks.

## Educating Employees

Before AI adoption, SMEs should educate employees on its capabilities, limitations, accuracy, and potential biases in workflow integration. Defining the role of AI tools within team tasks is essential. In manufacturing, when AI-powered robots are installed, employees should understand how to collaborate with them effectively, focusing on tasks that play to human strengths while leveraging robotic process automation for routine jobs.

Employees using AI tools must familiarize themselves with data security and privacy concerns. In healthcare, where AI aids in diagnosing medical conditions, employees must be aware of privacy regulations and the importance of safeguarding patient data during the AI-enabled diagnostic process.

Having a contingency plan is necessary in case AI tools don't meet expectations. For example, a logistics company adopts AI for route optimization; if the AI's recommendations consistently lead to delays, employees should be prepared to revert to conventional routing strategies as needed.

Also, implementing AI tools necessitates ongoing training and skills development. Effective communication within the organization is essential when incorporating AI tools, e.g., when a financial services company introduces AI-driven portfolio management, employees need to communicate transparently with clients about the uses of AI in investment decisions and the continued presence of human expertise.

AI used in HR functions must comply with employment laws; other statutory and regulatory requirements; and diversity, equity, and inclusion issues. Communicate clearly during the implementation that this will help employees optimize routine tasks and allow them to focus on nonrepetitive tasks.

## Communication with Customers

Websites can be built with AI chatbots and virtual assistants to communicate with customers via email, social media posts, press releases and media announcements, product data research, pricing requests for vendor selection, automated resolutions of requests or complaints, and order updates. SMEs can use such tools to personalize their marketing and customer service with customized content creation.

A recent example of the use of AI is a huge safety measure in the swimming pool at the Ann Arbor, Mich., YMCA. AI technology integrated with the YMCA's existing closed-circuit TV cameras to alert the lifeguards on their smartwatches when a distress signal is observed.

## Suppliers and Data

AI is often applied to supply chain management. When executives use AI to research and communicate with suppliers, they should be transparent about data collection and usage, obtain explicit consent and explain benefits, collect only necessary data, ensure accuracy, provide easy access to tools, and implement proper controls.

Also, management should implement strong data security and privacy protection measures, use encryption for data protection, control access to authorized personnel, prepare for cyber incidents, and train employees tasked with supply chain management. Another factor to consider in using AI is applicable regulations related to suppliers, so a company should stay compliant with industry regulations, seek legal advice, maintain records, and sustain customer and supplier rights and privacy policies.

## Management Processes

Managers can employ AI in various activities, e.g., automated routine processing in accounting. Managers implement AI-driven cybersecurity solutions to monitor data and network activities in a digital era with a huge variety of cyber threats. Through AI, they can detect unusual activity in information systems, issue early warnings of breaches, and signal new opportunities.

Also, managers can use predictive modeling for planning. Companies can improve labor and support efficiencies using predictive maintenance (PM), prepare for weathering uncertainties, and build a resilient business model. A polyvinyl chloride company in southern Ohio faced the prohibitive cost of a factory line shutdown and start-up for reactive machine breakdowns. Managers installed machine learning-based control systems to alert and coordinate their PM program.

## Environmental, Social, and Governance

The use of AI has implications for companies' environmental, social, and governance activities. For example, AI can optimize energy consumption in various sectors, such as manufacturing, transportation, and buildings. Smart systems can adjust energy usage based on real-time data, leading to reduced waste and costs. Conversely, AI model training and operations can be computationally intensive, consuming significant energy, but advancements in energy-efficient hardware and algorithms are mitigating this concern.

AI-powered sensors and data analytics can enhance resource management in agriculture and water distribution, leading to reduced waste, improved yields, and sustainable practices. However, the production of AI hardware can contribute to electronic waste if not managed properly. AI can analyze large data sets to predict and manage natural disasters, helping small businesses' early warning systems and response coordination.

An example of social impact is when AI aids in medical diagnoses, drug discovery, and personalized medicine. It can improve patient outcomes, especially in remote areas with limited medical resources. That said, concerns arise regarding privacy, data security, and potential biases in AI algorithms used for healthcare decisions.

## Weigh the Pros and Cons

AI can automate repetitive tasks, increasing efficiency and allowing humans to focus on creative tasks and strategic planning. The downside is that job displacement can occur in specific sectors, requiring reskilling efforts to avoid potential societal disruption.

SMEs must evaluate familiar challenges. Most notably, AI prompts questions related to data quality, biases, the ROI of any significant investments, a shortage of financial and human resources, integration with existing systems, ease of scalability, security and privacy concerns, ethical and legal issues, social acceptance, and organizational culture as resistance to change or fear of job elimination. Despite risks and challenges, AI is here to stay. To be part of the technological revolution sparked by global integration of AI tools, it's paramount that SMEs conduct cost-benefit analyses and strive to take advantage of the strategic use cases of AI tools to spur growth and outmaneuver their competition.

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# Ethics-Driven Risk Governance

CFOs can align and integrate ERM, cybersecurity, sustainability, and ESG with ethics to create long-term organizational value.

**By Mark L. Frigo, Ph.D., CMA, CPA, and Christopher A. Geiger**

Continuing research by the Strategic Risk Management Lab at DePaul University's Kellstadt Graduate School of Business studies how companies develop strategies to create long-term sustainable value based on positive risk governance focused on creating and protecting value. This research includes studying leading practices in risk governance, such as Lockheed Martin's coordinated governance of enterprise risk management (ERM) and sustainability, and its focus on ethics for positive risk management. Lockheed Martin practices have evolved the governance of ERM and sustainability with an ethics-oriented mindset.

Mark L. Frigo and Christopher A. Geiger, Lockheed Martin's vice president of internal audit and ERM, discuss how CFOs, finance organizations, and boards can take a leadership role in establishing and supporting ethics-driven risk governance focused on creating and protecting long-term value.

## Evolution of Ethics and Enterprise Assurance

Lockheed Martin's Ethics and Enterprise Assurance (EEA) division started from Ethics and Business Conduct, which administers a long-standing ethics program based on the company's core values: Do what's right, respect others, and perform with excellence. In 2011, a sustainability organization was formalized to develop Lockheed Martin's sustainability strategy and conduct related reporting. This new sustainability organization joined Ethics and Business Conduct to create Ethics and Sustainability. In 2017, internal audit and ERM were incorporated to create Internal Audit, Ethics, and Sustainability. In 2018, environment, safety, and health (ESH) and health and wellness joined the organization, and a new overarching and succinct name was required for the combined organization (see Figure 1).

### FIGURE 1: EEA ORGANIZATIONAL EVOLUTION


Ethics and Enterprise Assurance has been the name of the department ever since. It relays the centrality of ethics and the role that all of the subfunctions play in assuring the corporation addresses relevant risks. It also serves to reinforce the commitment to integrity and a speak-up culture.

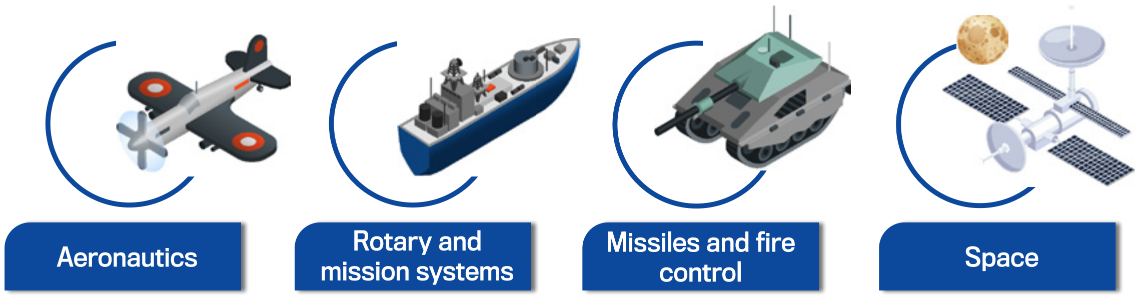
## Part 1: Ethics-Driven Risk Governance

Research on high-performance companies shows a distinct focus on being ethics-driven. High performance companies adhere to Tenet 1, "Ethically Maximize Wealth," in the Return Driven Strategy framework, creating long-term sustainable value in the process. "Ethically" means closely adhering to the ethical values of the stakeholders of a company as the stakeholders define them and awareness of how the ethical values of stakeholders are changing.

**Mark L. Frigo:** One of the distinguishing features of the Lockheed Martin EEA organization's risk governance is its focus on ethics. Please describe how ethics became a driving force for risk governance at Lockheed Martin.

**Christopher A. Geiger:** Lockheed Martin is a mission-oriented global security and aerospace company focused on ensuring those we serve always stay ahead of ready (as described in Figure 2).

## FIGURE 2: ABOUT LOCKHEED MARTIN




- Global security and aerospace company engaged in research, design, development, manufacture, integration, and sustainment of advanced technology systems, products, and services
- 114,000+ employees
- $66 billion 2022 net sales

- Dow Jones Sustainability Indices World Index and North American Index Ranking
- Energy Star 2021 Partner of the Year Sustained Excellence Award
- Gold Brandon Hall Human Capital Management Excellence Award for Excellence in Human Resources
- JUST Capital: First of Aerospace and defense companies included in the JUST 100 for third consecutive year
- National Organization on Disability 2021 Leading Disability Employer

Lockheed Martin's ethics program and training support this mission through our values-based principles governing employee behaviors, conduct, and decision making. When business operations are built on a foundation of integrity, employees rely on trust and transparency to speak up and help identify and address risks. Our ERM supports the mission by identifying and treating potential material issues to the company's strategy. Essentially ethics is values risk governance, and ERM is strategy risk governance. They're both required for the long-term, purpose-driven sustainability of the company.

When seen in this light, ethics is a natural foundation for overall corporate risk governance. Over the past 12 years, our EEA organization developed from an ethics and business conduct foundation to an expanded assurance function that also encompasses internal audit, ERM, environment, safety, health, and sustainability. Maintaining ethics at the core of EEA keeps the risk governance processes grounded. From the perspective of internal audit and ERM, I can vouch for the benefits of operating in an explicitly ethics-based function as it provides a clear focus on long-term corporate value rather than purely near-term financial goals.

In addition to our company's ethics foundation, there's the wider mandate from the COSO (Committee of Sponsoring Organizations of the Treadway Commission) ERM framework's number-one principle, "The organization demonstrates commitment to integrity and ethical values." An ERM or compliance program that isn't rooted in ethics is likely to miss some of the most important potential issues. Similarly, a rules-based ERM program likely devolves into a box-checking exercise. The COSO ERM framework advocates a long-term-value-focused ERM program with a principles-based approach and a clear connection to the purpose of the organization.

A practical example of the benefits of EEA collaboration is the ongoing partnership between ethics and internal audit on special projects. Internal audit contributes technical subject-matter expertise—such as accounting—and ethics contributes investigative and employee conduct expertise. Together we're able to best adjudicate potential corporate risks that entwine ethical and technical aspects.

**MLF:** Lockheed Martin's clear focus on "long-term corporate value rather than purely near-term financial goals" is representative of high-performance companies that create superior and sustainable value creation. The view of ethics as "values risk governance" and ERM as "strategy risk governance" is a useful way to communicate the relationship between ethics and ERM toward achieving long-term, purpose-driven sustainability.

## Part 2: Sustainability and ESG

Continuing research on high-performance companies in the Return Driven Strategy initiative shows a "vigilance to forces of change and an ability to manage both the risks and opportunities driven by those forces of change better than other companies. Today, sustainability and environmental, social, and governance (ESG) represent significant forces of change that need to be integrated into companies' risk governance."

**MLF:** Please describe how sustainability and ESG are integrated in risk governance at Lockheed Martin.

**CAG:** In 2017, Lockheed Martin integrated our sustainability and ERM functions. This benefited the operations of both disciplines and also enhanced related communication with management and the board of directors. Sustainability incorporated some of ERM's process rigor in analyses such as the climate work that evolved into our Task Force for Climate-related Financial Disclosures reporting. ERM moved to link enterprise risks and compliance risks to associated sustainability issues to ensure action plans were aligned and nonduplicative.

On the governance front, we've also strengthened the connection between ERM and sustainability. We leveraged our risk and compliance committee (RCC) to serve as a forum for business area and corporate functional representatives to review and guide enterprise sustainability initiatives and provide input to related plans. This facilitates the RCC having a greater time horizon beyond the short and medium term. Another way sustainability governance is integrated into wider corporate governance is using the same corporate disclosures and control committee (DCC) to review public sustainability disclosures as we do for public financial disclosures. Figure 3 shows an example of ESG risk and SEC [U.S. Securities & Exchange Commission] disclosure coverage.

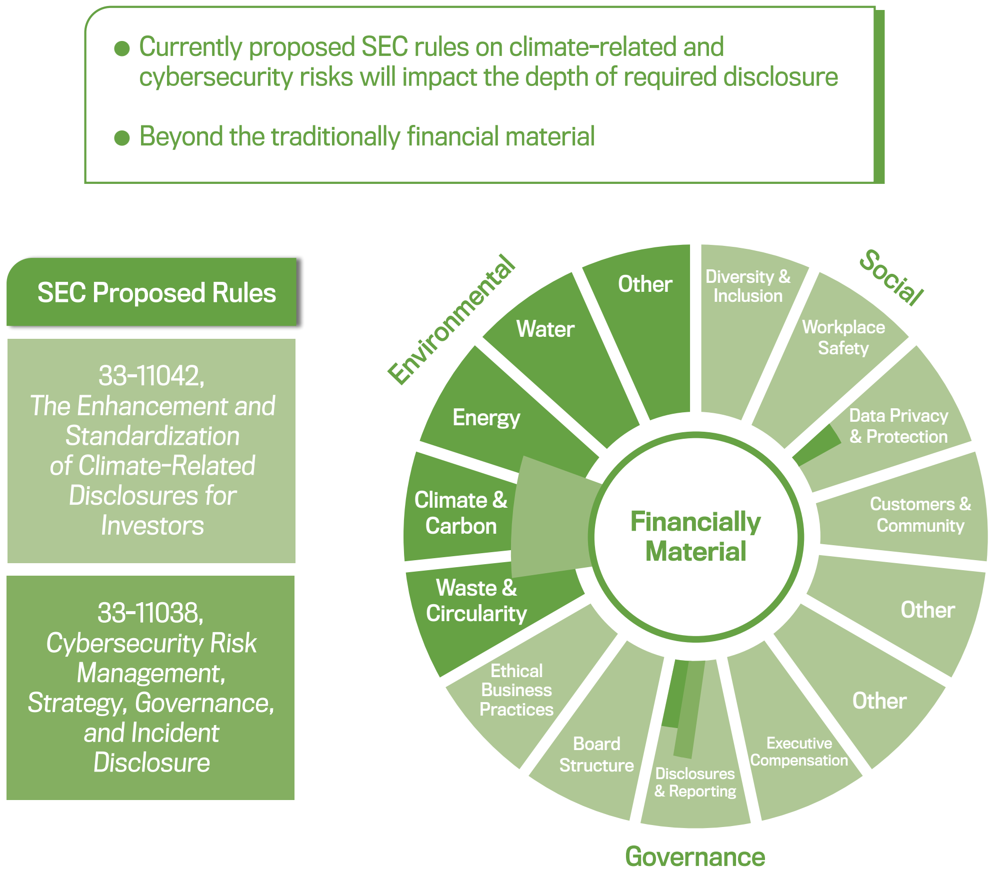
**MLF:** Integrating sustainability in ERM and leveraging the RCC provide a useful way to review and guide enterprise sustainability initiatives and guide actions toward long-term value creation. Integrating sustainability governance using the corporate DCC to review public sustainability disclosures and public financial disclosures is another leading practice other companies can adopt.

A recent SEC disclosure requirement for SEC cybersecurity risk disclosures starts on December 18, 2023. The approach used at Lockheed Martin provides a proactive and strategic way for these public disclosures on cybersecurity risks.

## Part 3: Cybersecurity and ESG

At Lockheed Martin, cybersecurity is considered in an ESG context. This is done by viewing cybersecurity as an element of ESG, referred to as "digital responsibility," which includes AI, data privacy and protection, and intellectual property rights.

## FIGURE 3: ESG RISK AND SEC DISCLOSURE COVERAGE




**MLF:** A previous article in this series, Strategic Management of Cybersecurity Risks, discussed how to use the COSO Strategic Risk Assessment process for assessing and managing cybersecurity risks. The Lockheed Martin EEA program for risk governance integrates sustainability and ESG into the program. Please describe how cybersecurity as an element of ESG is integrated in risk governance at Lockheed Martin.

**CAG:** Lockheed Martin develops our sustainability management plan and associated goals from a periodic core issues assessment. When we conduct our assessment, we include internal and external stakeholders and consider potential issues that may affect Lockheed Martin's long-term sustainability, including issues that extend beyond traditional ESG elements.

During our most recent core issues assessment, we developed "elevating digital responsibility" as one of the four priority areas with issues including AI, data privacy and protection, and intellectual property rights. We release public goals to advance progress in these areas.

The sustainability core issues assessment results, goals, and progress are all inputs to our EEA comprehensive risk universe. Internal audit and ERM use this information to inform the internal audit plan, compliance risk assessments, and the emerging risk program. A good example of how this work relates to ethics in AI: Our "elevating digital responsibility" priority area includes ethics in AI as one of 13 core issues. The public goal associated with this issue relates to training developers in ethical AI system engineering approaches. In addition, internal risk governance actions included the release of an ethical AI policy and ERM including AI governance in their next compliance risk assessment.

**MLF:** The consideration of potential issues that may affect Lockheed Martin's long-term sustainability, including issues that extend beyond traditional ESG elements, as one of the four priority areas is a useful way to elevate cybersecurity as a core strategic issue.

## Part 4: Sustainability and ERM

In this section, we discuss the relationship between sustainability and ERM at Lockheed Martin.

**MLF:** A previous article in this series, Sustainability for Long-Term Value Creation, discussed how to use the COSO Strategic Risk Assessment process for assessing and managing sustainability risks and opportunities. The Lockheed Martin EEA program for risk governance integrates sustainability into the program. Please describe how Lockheed Martin reflects the COSO Strategic Risk Assessment process in its risk governance.

This article is part of the Creating Greater Long-Term Sustainable Value series in *Strategic Finance* launched by the October 2018 article Creating Greater Long-Term Sustainable Value, by Mark L. Frigo, with Dominic Barton.

**CAG:** The COSO internal control components of the Strategic Risk Assessment process—control environment, risk assessment, control activities, information and communication, and monitoring activities—are a structured way to mainstream risk governance into normal business operations. I find COSO helps to maintain risk governance's focus on the organizational strategy.

Similarly, our sustainability programs have benefited from the continual evolution of our risk-based approach. Lockheed Martin's early sustainability efforts were governed by a bespoke governance structure at the executive leadership level. As our sustainability programs and focus evolved, we now incorporate sustainability into the overall strategic and risk management focus of our executive leadership team. In addition, we continue to mature the alignment of our sustainability and ERM management processes such as through the risk and compliance committee where all enterprise risk topics are regularly monitored.

Taking a wider view, both sustainability and ERM rely on a foundation of ethics. At Lockheed Martin, we've coalesced many risk, compliance, and assurance functions in an organization founded on ethics. This organizational structure may not be traditional in corporate America, but COSO includes "commitment to integrity and ethical values" as Principle #1 falls under the internal controls component. We've proven that maintaining focus on COSO Principle #1 aligns risk management and sustainability with organizational long-term value and growth.

**MLF:** The focus on COSO Principle #1 is a useful way to align risk management with long-term value creation, an approach that other companies can adopt.

CFOs and finance organizations can take a leadership role in developing ethics-driven risk governance focused on creating and protecting long-term value by adapting the leading practices described in this article. This can include aligning and integrating your ethics and corporate purpose with ERM, cybersecurity, sustainability, and ESG; taking a strategic view of sustainability, ESG, and cybersecurity as long-term value creators; using a strategic risk-assessment process for sustainability and cybersecurity risks; and establishing ethics as a foundation for positive risk governance.

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# Supply Chain Finance in the Trenches

CFOs can manage supply chain disruption and improve operations by effectively partnering with cross-functional colleagues.

**By J. Stephen McNally, CMA, CPA**

The *Strategic Finance* article The CFO as Supply Chain Manager notes, “Recent supply chain disruptions have impacted both the top line and the bottom line” and that “such vulnerabilities have placed a spotlight on the CFO to help navigate these challenges with actionable solutions.” The authors further observe that “the need for the CFO to work as a collaborative business partner is even more urgent in a disrupted supply chain as operational managers need data to drive deeper insight and support decision making.”

Many global supply chains, due to the lingering impact of COVID-19, energy crises, the war in Ukraine, and other disruptions, are indeed on the verge of breaking (if they aren’t broken already). And these challenges are likely to continue well into the foreseeable future. In this ominous environment, what is the role of the CFO and the management accounting and finance team? On what should you focus to help your organization effectively face current—and prepare for future—supply chain challenges?

Having spent many years at a *Fortune* 500 consumer goods company—including my last role at Campbell Soup Company as the finance executive for our largest supply chain operation, accounting for approximately 20% of the company's global sales at the time—I believe the CFO's team is ideally positioned to support cross-functional supply chain partners.

Leveraging our strategic agility, general business acumen, risk management, technical and analytical skills, and overall leadership ability, as well as our business partnership mentality, curiosity, and drive to deliver results, management accounting and finance professionals are uniquely qualified to tackle today's supply chain challenges and create opportunities for building a stronger supply chain for tomorrow.

## Setting the Stage

The world has undergone a seismic shift during our lifetime, including dramatic changes in the business and operating environments. Markets have steadily globalized. Business models have rapidly evolved, including greater use of internal shared services teams, as well as outsourcing and offshoring of such services to third-party service providers. Manufacturing companies increasingly source raw materials and assemble products from multiple locations. At the same time, they're tightly managing inventories to minimize carrying costs. Even small and midsize enterprises (SMEs) can gain a global presence by leveraging new technologies and cheaper, faster logistics.

This globalization trend was unstoppable until 2020, when the global supply chain was severely tested by the pandemic. Ever since, we've been facing unprecedented business disruption and uncertainty, including COVID-19 lockdowns, energy shortfalls, geopolitical tensions, armed conflicts, soaring inflation, and, more recently, increasing interest rates, bank failures, and threats of recession. Disruption has impacted every link in the supply chain, from parts and labor shortages, factory shutdowns, port congestion, and increasing delivery delays and costs to trade conflicts, tariffs, and extreme weather events.

These challenges are, unfortunately, still unfolding. In the years ahead, when the dust finally settles, we're likely to see a very different world with a very different global supply chain. As such, companies will change their approach to globalization. For example, many manufacturers will strive to diminish supplier dependence and supply risk by diversifying their sourcing, bringing production back onshore, and/or moving it to other, more dependable offshore locations. And to the extent that countries continue to increase their import tax rates and duties, impacting the total cost of ownership of goods, business owners will be forced to rethink their supply chain network.

## Supply Chain Management

Supply chain leaders, including CFOs and their teams, are accountable for organizing and overseeing their company's supply chain. For a global manufacturer, this encompasses the end-to-end process of acquiring raw materials, manufacturing products, and distributing these goods to customers. Supply chains—from procurement, vendor oversight, and inventory management to coordination of freight companies and distributors—are complex.

To anticipate and proactively address issues and to manage customer expectations, especially when facing gaps, supply chain leaders need transparency into each step of the supply chain. Proactively and creatively overcoming challenges is a business imperative. To strengthen your supply chain, carefully analyze it end to end, identifying potential weaknesses and looking for opportunities (see "Supply Chain Analysis" for examples).

## Stories from the Trenches

The following are just a few stories "from the trenches" of how CFOs and their teams can effectively partner with their cross-functional colleagues in supply chain management to mitigate disruption and build stronger operations:

**Inventory management.** For a food and beverage manufacturer, having the right inventory at the right place at the right time is critical. To keep production lines running, you need to have all the required ingredients and packaging materials available for the scheduled item to run. If you're missing or run short of just one ingredient (a spice, for example), production will stop. Or, if you experience equipment failure and there are no on-site spare parts to fix the problem, you may face significant downtime or loss. Likewise, if you reject a large order with same-day shipment because your inventory system inaccurately showed no in-hand stock, you'll lose the sale and may alienate the customer.

Thus, tightly managing inventory, whether it's raw materials, finished product, or storeroom parts, is a business imperative. But doing so efficiently and effectively can be challenging. Imagine you store nearly 10 million cases of finished product across hundreds of product codes in your on-site warehouse. Historically, you conducted annual wall-to-wall physical inventories to verify inventory counts. To conduct this inventory required approximately 150 cross-functional associates working over a long weekend. After the annual physical, the inventory system reflected accurate counts, but this accuracy invariably deteriorated over the next 364 days. Then, when the site began using SAP software for its enterprise resource planning needs and managing inventory at the lot level, conducting wall-to-wall inventories became totally infeasible.

To address this challenge, the finance inventory control team recommended implementation of a new cycle count program whereby each raw material, finished product, and spare part item was counted at least quarterly.

## Supply Chain Analysis

- **Demand planning.** Can you project future customer demand, then leverage these projections to prioritize and customize your company's delivery of these products or services? Engage key customers in joint demand planning sessions to develop directional long-term forecasts and more precise short-term production requirements.
- **Sourcing materials.** Do you understand the impact on production if a supplier can't deliver key materials, especially those used in top-performing products? Carefully assess all critical suppliers to ensure they have scale, identifying alternatives where needed. Then build and strengthen relationships with these suppliers, increasing the probability you'll receive preference if there's a disruption.
- **Manufacturing downtime.** Can you meet demand if certain production facilities aren't operating or are operating below full capacity? Implement preventive maintenance programs and proactively monitor equipment health to minimize unplanned downtime. In addition, identify potential co-manufacturing partners, whether internal or third party, as backup.
- **Inventory management.** Do you have complete visibility into your inventory, including raw materials and finished products, to facilitate making informed decisions? Ensure operational discipline in reporting materials usage and daily production, and consider implementing a cycle count program to augment or replace the traditional wall-to-wall physical inventory.
- **Freight and distribution.** Do you have a reliable network of freight companies and distributors to ensure raw materials are received and customer shipments are delivered on time? Analyze pallet configuration, truck weights, and trucking lanes to optimize cost. Assess your shipping network to ensure freight and distribution partners are providing reliable, timely, and cost-effective services. And discuss risks with your insurance broker to ensure appropriate coverage is in place to mitigate them.
- **The day-to-day.** Are there opportunities to run the operation more efficiently and/or effectively? Adopt a continuous improvement mindset, proactively identifying cost reduction opportunities, improving culture, managing risk, and otherwise enhancing business sustainability.

Leveraging its inventory control expertise and knowledge of SAP, the team defined the cycle count procedures, developed SAP reporting, and trained the operations teams on how to implement the cycle count program.

Then, on a quarterly basis, the finance inventory control team audited the cycle count documentation prepared by the operations teams and conducted test counts. The team formally documented its quarterly reviews, including recommendations for continuous improvement, which proved invaluable over the first year. Effective inventory management via cycle counting enabled the site to consistently deliver a high level of customer service, which kept customers smiling.

**Materials sourcing.** As noted previously, a food manufacturer must have the right ingredients and packaging materials at the right place and time. The complexity of manufacturing several hundred different soup, sauce, and beverage products, each with unique formulas and packaging requirements, can't be overstated. The following are two examples with creative solutions enabled by the finance team.

**1.** At Campbell Soup, some of our products used watercress, a delicate leafy vegetable that grows best in shady areas like water gardens and stream banks. We sourced beets, carrots, celery, lettuce, spinach, and other vegetables, including watercress, from local farmers. Due to the challenges of growing, harvesting, and transporting fresh watercress, the number of farmers locally offering it over the years dwindled to one.

Even that one farmer started having second thoughts, indeed contacting us just before planting time to say he wouldn't be offering watercress during the upcoming season. Through negotiation, the farmer agreed to produce watercress for one more season, giving us the opportunity to meet current year demand and identify new sources for this key but elusive ingredient for the future.

**2.** Over the years, many beverage manufacturers have replaced traditionally glass bottles with plastic ones. Many plastic bottles are produced in a two-step process, whereby a preform is injection-molded and then this preform is blow-molded into the final bottle.

The plastic bottles are then shipped to the beverage manufacturer where they're filled, packaged, and shipped to retailers for sale to the ultimate consumer. Because blow-molded bottles are so light, manufacturers are essentially paying to transport air. At one point, our bottle partner noted they needed to invest in additional blow-molding capacity to meet our steadily increasing demand for plastic bottles. We negotiated with the company to place its new equipment on-site at our beverage facility.

Specifically, we built an addition to the beverage facility so that the bottle partner could increase its blow-molding capacity by placing its new equipment in it. Once the addition was in place, our bottle partner could ship preforms (vs. blown bottles) to our site and blow the bottles based on our demand (aka Just-in-Time), with the bottles traveling along a conveyor belt from our bottling partner's building to our beverage lines as needed. We justified both parties' investments by analyzing the savings of shipping preforms vs. bottles (essentially air) relative to the cost of building an on-site facility for them.

**Business transformation.** Business transformation is all about trying to change the way you do business, whether globally, enterprise-wide, or on a more limited scale, such as within a specific team, function, or location. Unfortunately, though, a high percentage of transformations fail. Management accounting and finance professionals, leveraging our project management skills, general business acumen, and attention to detail, can make all the difference in enabling success.

Implementing SAP enterprise wide, including the retirement of hundreds of legacy systems, can be daunting. During my time at Campbell Soup, the corporate strategy was to implement SAP at our sister operations first, knowing we could provide manufacturing and distribution support as needed if there were glitches, and then leverage lessons learned to ensure our SAP transition was smooth (i.e., being the largest operation and offering several unique products, no other site could effectively and fully back us up). That said, the corporate SAP project team had a standard formula on when and how to engage a given operation in advance of its proposed go-live date, so it initially pushed back when we requested to start our prework much earlier than the team's proposed timeline. But after providing the team with analysis and insight showing that our operation truly was unique and that we couldn't afford a glitch, the team agreed to our revised timeline. In the end, our site's SAP transition was completely uneventful, and we were recognized accordingly.

Another corporate initiative was to transform supply chain finance by outsourcing and offshoring routine roles and responsibilities. The call came on a Monday morning. Our site would be the pilot, the initiative would be publicly announced in two weeks, on-site transfer of knowledge to the third-party provider would begin in three weeks, and go-live would be in six months.

By carefully analyzing and clarifying the initiative's scope, we gained alignment that the originally expected reduction in head count was too high. By identifying potential risks during the planning phase, we were able to mitigate them as appropriate. By clearly defining the processes to be transitioned and specifying that these were to be captured in desktop procedure documents and approved by the existing team during the on-site knowledge transfer phase, we ensured a timely and successful go-live. Indeed, much more quickly than anticipated, the transition moved into a successful, steady "future state," and the local team began focusing on providing decision support and otherwise supporting its cross-functional business partners.

**Sustainability.** When I was the finance executive for Campbell's premier operation in Northwest Ohio, our site was named *Food Processing* magazine's 2014 Green Plant of the Year. This recognition underscored our success in implementing sustainable manufacturing practices. Our goal, though, wasn't sustainability at any cost, but rather to manufacture high-quality products at the lowest possible cost. Thus, we scrutinized every investment proposal, whether sustainability-related or not, to ensure the reasonability of underlying assumptions and the acceptability of the anticipated return on investment.

During our journey, we considered several high-profile investments, including a solar field, a wind farm, and a biogas facility. In the end, we partnered with a third party that built a 24,000-panel solar array on 60 acres adjacent to Campbell's operations. Based on estimates at the time, this solar array would reduce the site's electricity costs by $4 million and eliminate 250,000 metric tons of greenhouse gas over the 20-year agreement period. In addition, we prioritized identifying and addressing old, inefficient, and environmentally unfriendly equipment. For example, we gained corporate alignment to retire the site's coal- and oil-fired boilers (historically a competitive advantage relative to other operations in the network), replacing them with natural gas boilers after analyzing the likely investment required to upgrade and maintain them.

Although high-profile investments generate buzz, smaller investments and process changes, collectively, may represent a greater opportunity to increase an organization's sustainability. For example, we replaced fluorescent light fixtures with more efficient LED lighting products, including motion-activated lighting where appropriate. We converted to high-efficiency motors with variable-frequency drive technology, invested in preventive maintenance programs to improve equipment reliability, incentivized solid waste recycling, and invested in water recycling technology. And we leveraged stock-keeping unit rationalization to reduce warehousing costs, packaging costs, and inventory obsolescence. In short, we sought out the low-hanging fruit.

Over the years, the drumbeat for change has been growing louder and more urgent. Management accounting and finance professionals, by embracing and prioritizing sustainability initiatives, can create economic value for their organization. That is, investment in sustainability can be an investment in the bottom line.

**Risk management.** Some argue that only the most clairvoyant supply chain risk management professionals would have considered a virus outbreak in their assessment. Here's the story of one such team.

Each year, the executive leadership team of a large food and beverage supply chain operation conducted a tabletop exercise to ensure each cross-functional partner understood their role regarding crisis management and business continuity. During a typical tabletop exercise, the cross-functional team received limited information about an issue, discussed and aligned on appropriate actions, and then, in an iterative process, received additional information and refined its plan accordingly.

As a follow-up to the exercise, our team formalized a business continuity plan for the given scenario. Each year, the team faced a different challenge, including a workforce strike, a massive fire at the plant, and, in 2017, an avian flu outbreak threatening to shut down operations during the height of busy season. Although none of the tabletop exercises specifically considered a global pandemic, the lessons learned during the 2017 avian flu exercise proved invaluable when COVID-19 struck in 2020.

**Earning your seat.** Leveraging the ability to think strategically, analyze complex business issues, and solve problems, along with access to organizational performance data and insights regarding key drivers underlying the business, CFOs and their teams are ideally suited to support their partners in supply chain management. But to drive and make strategic decisions, you need to be "at the table" every day, and, to be at the table, you need to "earn your seat."

Soon after arriving at Campbell's largest supply chain operation, the plant manager decided to implement daily direction setting (DDS) teams to engage and support the various production teams more effectively. The Sauce

## Finance Professionals' Perspective on Supply Chains

**VISION**
Establish shared challenges and future vision that support the purpose of the entity and align to the strategic objectives in delivering products and services to the customer in an effective and efficient manner.

**TRUSTED FINANCE BUSINESS PARTNER**
Provide relevant, accurate, and informed advice to support decision making, including understanding the cost base and cost to serve, thereby strengthening the relationship between supply chains and finance.

**PLANNING AND FORECASTING**
Change planning, budgeting, and forecasting horizons in response to the evolving nature of the entity and the environment in which it operates, accepting that traditional cycles may no longer apply.

**DATA AND TECHNOLOGY**
Work together to ensure that technology and data developments address collective requirements. Appreciating the importance of predictive analytics and ensuring that the relevant data is available; understand how digital supply chains are making business models evolve.

**ESG AGENDA**
Recognize the importance of the environmental, social, and governance (ESG) agenda, ethical supply chains, and nonfinancial reporting, especially as regards suppliers across the supply chain network relationships and how these can be understood.

**MANAGING DISRUPTION**
Prepare the entity to weather the next round of disruption and ensure that the modeling capabilities are available to allow understanding of the opportunities that appear.

**COLLABORATIVE MINDSET**
Recognize that collaboration is key-respecting the differences, maximizing the commonality; approaching with a project-centric and collaborative mindset.

**VISIBILITY**
End-to-end visibility is key across supply chains as entities look to enact strategies that will drive sustainability goals. Understanding the full nature of supply chains is essential in this.

**ETHICAL LENS**
Use the ethical lens in common to assess the challenges in supply chains and the behaviors of entities, especially as these lead to regulatory challenges.

**RISK AND DUE DILIGENCE**
Jointly engage in risk management and supplier due diligence activities as the challenges continue to evolve.

**Source:** Association of Chartered Certified Accountants, IMA® (Institute of Management Accountants), and Chartered Institute of Procurement & Supply, *Supply Chains: A Finance Professional's Perspective*, March 2022.

DDS Team, for example, consisted of representatives from Sauce production, maintenance, procurement, quality assurance, and industrial engineering. The typical agenda was to discuss safety, quality, and production trends along with any specific issues or concerns, then define follow-up action items and assign accountability and timing accordingly. Joining this DDS team was a great opportunity to hear firsthand the team's challenges and the resources needed to overcome them, enabling more timely and effective budget allocation. Ultimately, once the plant manager saw the benefits of having finance at the table, we agreed to assign a finance associate to each of the DDS teams.

## Call to Action

CFOs and their teams are ideally suited to overcome challenges that impact demand planning, materials sourcing, inventory management, and distribution; lead risk management; champion business transformation; and achieve sustainability goals. By effectively partnering with cross-functional colleagues in supply chain management, you can manage disruption and build stronger operations.

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# Innovative Processes in Finance and Accounting

Adopting innovative technologies can lead to streamlined processes, real-time insights, and increased focus on strategic planning.

By Vineet Jain, CA

In recent years, innovations in finance and accounting have revolutionized operations, and significant trends are reshaping the entire finance function. In all finance and accounting processes, whether bookkeeping, accounts payable, accounts receivable, or even complex analytics, a notable trend is the adoption of automation and AI. These innovative technologies have the unwavering potential to revolutionize finance and accounting.

There's hardly any counterargument regarding the benefits of these technologies to streamline processes, reduce errors, and enhance decision making, and they also provide real-time insights into financial data. This departure from manual, time-consuming tasks has allowed finance professionals to focus on higher-value activities such as strategic planning and risk management.

In comparison to other methods, the use of innovative technologies in finance and accounting provides efficiency and precision in outcomes. For instance, machine learning algorithms can analyze large data sets and identify patterns, enhancing fraud detection and risk assessment at the same time. Moreover, blockchain technology has revolutionized how transactions are recorded, resulting in transparency and security in financial dealings. These advancements empower companies to make informed decisions while ensuring compliance with regulations. Conversely, conventional practices often involve data entry that's prone to errors and time-consuming, leading to delays and potential discrepancies in financial reporting.

Innovative processes cover a range of activities including robotic process automation (RPA), predictive analytics, cloud-based accounting software, and digital auditing tools (see "Highly Impacted Activities"). RPA uses software robots to handle repetitive tasks such as data extraction and invoice processing, freeing up human resources for judgment-based strategic analysis. In the same way, predictive analytics leverages historical data, statistics, and algorithms to forecast future trends and patterns that can aid in processes such as budgeting and financial planning. Cloud-based accounting software enables real-time collaboration and data access, facilitating remote work and reducing the need for physical infrastructure, thus allowing the reduction of tasks and consolidation of work performed by several individuals on a team. Digital auditing tools enhance audit

## Highly Impacted Activities

- **AI-driven optical character recognition (OCR) and automation tools can accurately extract and process data.** OCR enables AI systems to scan and accurately input data from documents such as invoices and receipts. This minimizes the chances of errors and allows finance professionals to allocate their time more effectively toward strategic tasks, such as data analysis and decision making.

- **AI algorithms can analyze historical data to identify trends and patterns.** Predictive analytics powered by AI has revolutionized the profession and brought many changes. With the help of machine learning algorithms, vast amounts of data can be analyzed in intricate patterns and precise predictions made. This capability is invaluable in many scenarios, such as risk assessment, optimizing portfolios, and detecting extraordinary activities. For example, AI can accurately evaluate credit risk by examining a borrower's credit history, transaction records, and even unconventional factors. As a result, lending decisions are improved while default rates decrease. Predictive analytics equips finance professionals with insights that enable them to make decisions based on data and stay ahead in an ever-evolving market.

- **Large data sets can detect anomalies and unusual patterns, aiding in early fraud detection and prevention.** The finance and accounting profession has experienced a decrease in fraud-related activities due to the implementation of AI-powered systems. These advanced algorithms constantly monitor and analyze transactions in real time to identify unusual or suspicious patterns. Whenever any irregularities are detected, alerts are generated to initiate an investigation. The remarkable speed at which AI processes volumes of transaction data makes it an effective tool in preventing fraud. By automating the detection process, AI saves organizations money and contributes to maintaining their reputation, thereby earning more customer trust.

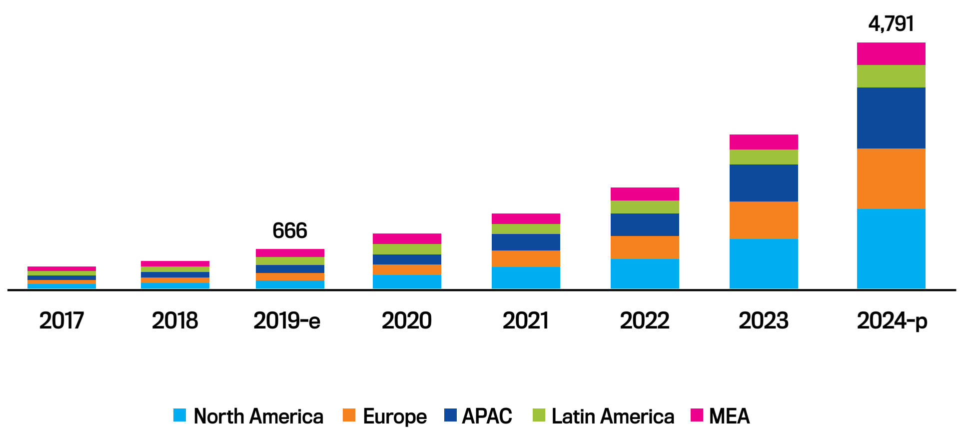
- **RPA can handle routine tasks.** RPA is extensively employed to handle tasks such as processing invoices, generating purchase orders, and conducting reconciliations. RPA bots can carry out these tasks swiftly, thereby reducing the need for labor and minimizing errors. This automation enhances efficiency and guarantees that processes are consistently executed, thereby improving financial accuracy and adherence to compliance standards.

- **AI can identify subtle patterns and correlations for decision making.** Using AI enables the uncovering of anomalies in data that could easily escape human analysts' attention. For example, AI can analyze market data to offer insights into investment strategies or detect irregularities in financial statements. This data-centric decision-making process empowers finance professionals to make informed choices, optimize their investments, and effectively manage risks.

efficiency by automating testing procedures and improving accuracy in financial statements. These activities have advanced underlying processes such as journal entry, month-end close, accounts payable, purchase orders, invoicing, and vendor payments.

The adoption of innovative processes is impacting the way finance and accounting now operate, and it's reshaping organizational, cultural, and work dynamics. Finance teams are transitioning from reactive postmortems to proactive analysis by leveraging data-driven insights that drive strategic decision making. With the advent of new technologies, the emphasis on continuous learning and upskilling has also become paramount. According to MarketsandMarkets, the market size of AI in accounting was $666 million in 2019 and is expected to grow to $4.7 billion by 2024 (see Figure 1). The shift toward remote work and digital collaboration has necessitated a more agile and adaptable work culture. Overall, these processes are improving the efficiency of accounting and finance functions, transforming how businesses approach financial management and cultivating a culture of innovation and adaptability.

## FIGURE 1: AI IN ACCOUNTING MARKET, BY REGION (USD MILLION)




Source: MarketsandMarkets, *Artificial Intelligence in Accounting Market by Component, Deployment Mode, Technology, Enterprise Size, Application (Automated Bookkeeping, Fraud and Risk Management, and Invoice Classification and Approvals), and Region – Global Forecast to 2024*.

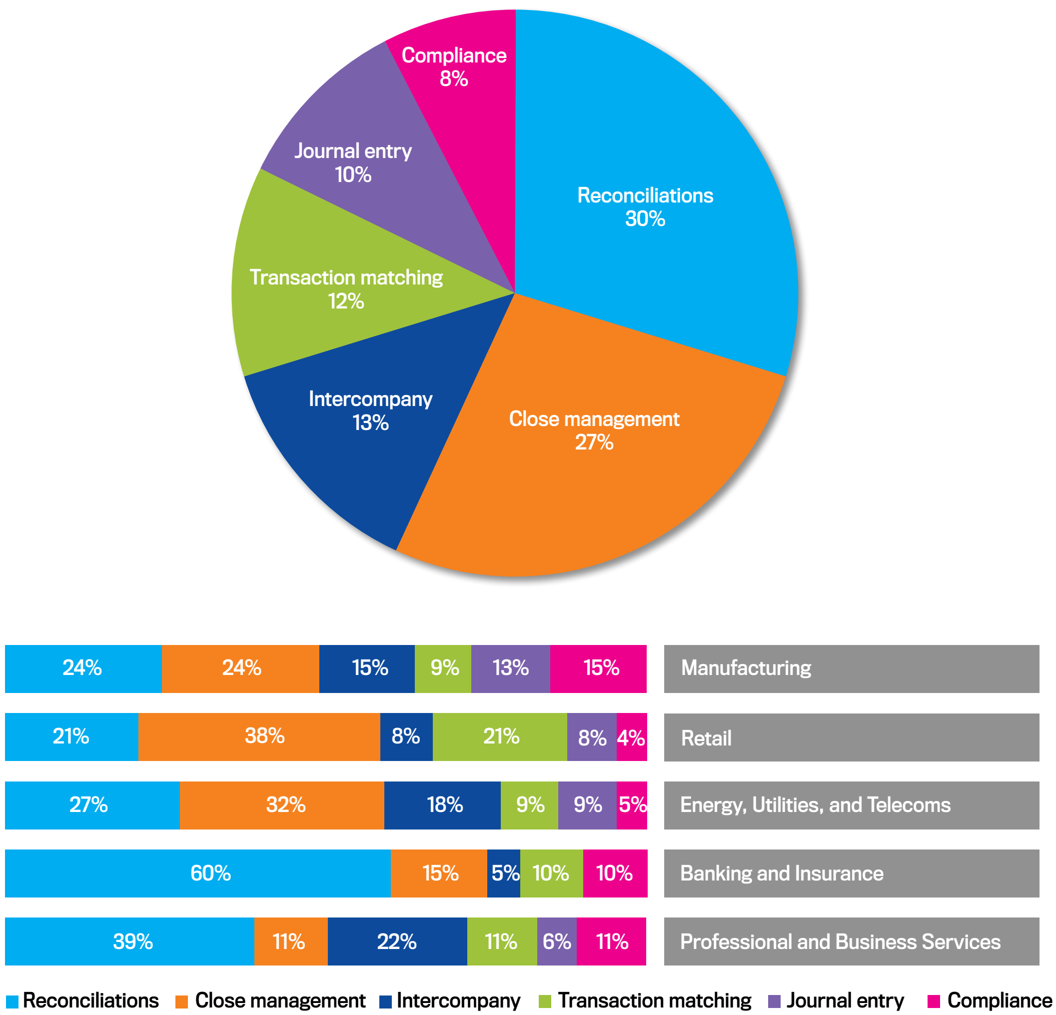
## Innovation in the Record-to-Report Process

Innovation in the record-to-report (R2R) process enhances operational efficiency. With routine and manual tasks being automated, finance teams can allocate more time to strategic analysis, data interpretation, and decision support. This transformation fosters a culture of continuous improvement and empowers finance professionals to provide valuable insights that drive business growth. This also helps organizations reap the benefits of streamlined operations, reduced costs, improved data accuracy, and a more agile approach to financial management.

Innovation in this area encompasses activities such as journal entry, reconciliation, and month-end close. It has become a driving force behind increased efficiency, accuracy, and agility in accounting and finance functions. Traditional manual handling of these tasks has often been time-consuming, error-prone, and resource-intensive. Technological advancements, particularly automation and data analytics, have revolutionized how these processes are executed, leading to significant improvements in the day-to-day management of financials.

According to a survey by Trintech, the reconciliation process is the most formidable hurdle in the month-end process, making it the natural choice for initial automation efforts. The survey reveals that 27% of respondents consider the management of the closing process as their biggest challenge during month-end activities (see Figure 2). Further, 60% of those respondents from the banking and insurance sector identified reconciliation as their most significant hurdle during the financial close process. In most other industries, the issue of transaction matching remains relatively consistent, with 9% to 11% of respondents encountering this challenge. In the retail sector, however, this percentage doubles, highlighting the unique complexities faced by retailers in transaction matching.

## FIGURE 2: WHICH SUBPROCESS POSES THE GREATEST CHALLENGES?




Source: Trintech, *Global Record to Report Benchmark Report*, 2020.

**Journal entry process.** As technology advances, there's a potential opportunity to increasingly build software solutions that allow for the automatic generation, approval, and posting of journal entries. This eliminates the need for manual data entry and ensures consistent application of accounting rules and standards.

AI-powered algorithms can analyze historical data and patterns to suggest appropriate journal entries, streamlining the process and reducing the risk of errors. Furthermore, automation can expedite the approval workflow and get input for journal entries from stakeholders, thereby enhancing collaboration among finance teams and providing real-time visibility into the status of entries. AI is capable of reading from requests that need a journal entry, analyzing transaction nature, identifying accounting heads, preparing entries, and posting them per the defined approval process.

Traditionally, journal entries involved manual data entry and validation, which were time-consuming and prone to errors. With advanced technologies like RPA and AI, journal entry processes have become more efficient and accurate. For example, AI has inbuilt logic that can automatically categorize and validate financial transactions based on historical data patterns. RPA bots are capable of executing these entries that not only reduce the risk of human error but also accelerate the process. This automation saves time and ensures that financial records are consistently accurate.

**Balance sheet account reconciliation.** The reconciliation process involves comparing two sets of records to ensure they match. This process has benefited immensely from technological innovation. Previously, reconciliations were often done manually, which required significant effort and time. Today, automated reconciliation tools leverage AI and machine learning to match and compare large volumes of transactions, accounts, and balances across multiple systems and to quickly identify discrepancies, exceptions, or anomalies, thus enabling finance professionals to focus on resolving complex issues rather than manually reconciling routine items. By reducing manual effort, organizations can achieve faster reconciliation cycles, improve data accuracy, and enhance overall financial transparency. These tools can import data automatically from banks and perform reconciliations. They can easily handle complex reconciliations, such as bank statement reconciliations and intercompany transactions. Unusual patterns identified in data by AI can be helpful for fraud detection and risk management as well.

**Month-end close.** The month-end close has the potential for significant transformation through innovative processes due to advancements in cloud-based accounting platforms and enterprise-wide integrated software applications that enable real-time collaboration and data sharing among cross-functional teams. This eliminates the need for physical proximity, increases productivity, and allows for simultaneous processing, review, and approval of month-end activities, ultimately shortening the amount of time to close. Automation of routine tasks, such as accrual calculations and variance analysis, helps expedite the month-end close and improves its accuracy. AI-driven predictive analytics can also anticipate potential bottlenecks or issues in the close process, allowing finance leaders to proactively allocate resources and address challenges before they impact the timeline. This automation also allows all the scheduled activities to be monitored, provides insights into the progress of the close, and analyzes the issues that might delay the close, allowing teams to proactively address these challenges.

## Innovation in the Accounts Payable Process

The field of accounts payable has undergone a significant transformation with the integration of innovative technologies, particularly in automated purchase orders, invoicing, and vendor payment processing. Traditional manual processes in accounts payable often involved paper-based documentation, manual data entry, and lengthy approval workflows. Automation, AI, and digital platforms have revolutionized how businesses manage their payables, enhancing efficiency, accuracy, and cost savings; automated and streamlined the payable process; and enabled a more strategic approach to financial management. The future of accounts payable with innovative technologies supports efficiency gains, enhanced vendor relationships, and opportunities for more proactive, strategic roles for finance professionals.

**Purchase orders.** Automated purchase orders have streamlined the procurement process by digitizing and automating the creation, approval, and systematic tracking of these documents. This eliminates the need for manual paperwork and speeds up the procurement cycle. AI algorithms can analyze historical purchasing data and patterns to optimize inventory levels, anticipate demand, and suggest the most cost-effective suppliers. Additionally, automated purchase orders facilitate better communication with vendors, ensuring accurate order fulfillment and reducing the likelihood of errors or discrepancies.

**Invoicing.** Paper invoices were traditionally prone to errors, delays, and lost documents. With automated invoicing, businesses can electronically receive and process invoices, reducing manual data entry and improving accuracy. AI-powered optical character recognition (OCR) technology can extract relevant information from invoices, such as invoice numbers, amounts, and due dates.

For example, if an invoice doesn't match due to price variation, AI will detect the price difference and automatically correct it. After the defined approvals on the price change, the invoice is routed out for payment. Lastly, automated workflows can route invoices for approval based on predefined rules. These innovations accelerate the approval process, ensure timely payments, and enhance vendor relationships, which may enable organizations to take advantage of early payment discounts.

**Vendor payments.** Automated payment platforms enable electronic fund transfers, eliminating the need for physical checks and manual signatures. This results in faster and more secure transactions, reducing the risk of fraud or payment errors. Payment automation can also integrate with enterprise resource planning (ERP) systems, providing real-time visibility into cash flow and financial obligations. Also, advancement in blockchain technology is being explored to enhance transparency and traceability of cross-border payments, which also ensures compliance with regulations and lowers transaction costs.

## Innovation in the Procure-to-Pay Process

Innovation in the procure-to-pay (P2P) process is reshaping how organizations manage every step, from approving vendors to paying invoices. The P2P process traditionally involved a lot of manual paperwork, communication issues, and a lengthy approval cycle. With the adoption of automation and AI, there's more efficiency, visibility, and collaboration across the entire supply chain in the P2P process.

**Vendor approvals.** There are dramatic changes in the vendor approval process due to the implementation of advanced vendor management systems. These platforms use AI and data analytics to assess vendor performance, financial stability, and compliance history. This is a data-driven approach that helps organizations make informed decisions when onboarding new vendors. It reduces the risk of fraud and ensures alignment with business objectives. Additionally, automated workflows are used to route vendor approvals to the appropriate stakeholders, speeding up the approval process and providing a clear audit trail.

**Purchase order management.** With automated solutions, issuing purchase orders has become more streamlined and error resistant. Instead of manually generating and circulating paper-based purchase orders, organizations can leverage digital procurement platforms. These AI-powered systems can suggest optimal suppliers based on their history and negotiated terms, making purchasing decisions cost-effective. These automated purchase orders reduce data-entry errors and enable real-time tracking of orders, ultimately ensuring the timely delivery of goods and services.

**Goods receipt process.** The way goods are received has also been transformed. In the supply chain, advanced tracking systems and connected Internet of Things (IoT) devices allow organizations to monitor the movement of goods at any point in time. There are also possibilities for real-time visibility into shipments, ensuring accurate and timely delivery. AI algorithms can predict potential delays and simultaneously provide insights required for proactive management. Also, using automated alerts and notifications enhances communication, which enables quick resolution of any issues arising during the goods receipt process. Some technologies involve connected devices that have transformed goods receipt processes, including radio frequency identification (RFID) for automated wireless technology, gate cameras that record goods receipts automatically, and barcode scanners that digitize labels, ensuring correct accounting records.

## Challenges of AI and Innovative Technologies

There's no doubt that AI and other innovative technologies have brought significant advancements to finance and accounting processes. Still, they also present many challenges that organizations need to address, which depend on the selected technology and its implementation. The following are some important challenges associated with AI and other innovative technologies in finance and accounting.

**Data quality and integration.** Predictive analytics that uses AI algorithms analyzes historical financial data to identify patterns and trends, which allows organizations to make more accurate automation results, forecasts for budgeting, cash flow projections, and financial planning. These tools consider a wide range of variables and market factors that provide insights for informed strategic decision making. Yet AI and automation heavily rely on high-quality data. An inaccurate or incomplete data set can lead to flawed insights and biased decisions. AI systems can consume biases present in historical data, leading to biased outcomes in decision making. This can be due to onetime transactions required for correct accounting applicable to a specific time. Mitigating bias and ensuring ethical AI usage require ongoing monitoring and refinement of algorithms. Also, integrating data from disparate sources can be complex and time-consuming tasks that require careful data governance.

**Adoption and change management.** Automation in finance processes involves AI systems that can understand, interpret, and process unstructured data from various sources, such as invoices, contracts, and emails. This technology can automatically extract relevant information, classify documents, initiate workflows, reduce manual data entry, and improve accuracy. Implementing these new technologies, however, often requires changes to established processes and workflows, and employees may resist implementing them. This resistance to change will require extensive training for employees to fully realize the benefits.

**Cybersecurity and data privacy.** AI algorithms can analyze vast amounts of transaction data to detect irregular patterns and anomalies indicative of fraudulent activities. Machine learning models continuously learn from new data and improve their ability to identify emerging fraud trends or prevent potential financial losses. As more data is processed and stored digitally, however, there's an increasing risk of data breaches and cyberattacks. Organizations need to implement a strategy for the robust protection of sensitive financial information and ensure compliance with data privacy regulations.

**High upfront cost.** While innovative technologies can lead to cost savings in the long run, the initial investment in acquiring and implementing these technologies can be significant. Organizations that focus more on the return on investment and payback will need to allocate resources effectively and carefully.

**Complexity and technical expertise.** Technology such as natural language processing (NLP) enables computers to understand and process human language, which is particularly useful for tasks like contract analysis and due diligence. NLP-powered tools have the ability to review contracts, extract key terms, and assess compliance with legal, regulatory, and financial standards. Integrating AI and other innovative technologies requires specialized technical expertise, however. Finding and retaining such skilled professionals can be a challenging task.

**Incorrect outcomes.** These innovative AI models have the ability to analyze complex risk scenarios by considering multiple variables and historical data that help finance teams assess and mitigate risks more effectively. But, as mentioned previously, AI systems can present biases in historical data that lead to incorrect outcomes. AI systems perpetuate biases present in historical data, and biases can emerge from the data itself or be introduced by underlying algorithms that can lead to unfair decisions. Finance and accounting professionals must take steps to audit AI systems for biases and errors regularly. This requires them to use diverse and representative data for training, promote transparency, and adhere to ethical frameworks. By addressing these concerns, finance and accounting professionals can harness the benefits of AI while ensuring ethical standards and fairness in their financial processes and data analytics. Therefore, ensuring ethical AI usage and minimizing bias is a critical challenge that needs to be addressed.

## Developing the Next Generation of Finance and Accounting Professionals

Due to the faster adoption of innovative processes such as automation, forward-thinking finance and accounting professionals are proactively preparing to minimize the negative impact on their career. Finance teams are recognizing the importance of acquiring new skills and taking steps to adapt to emerging trends. The following are some skills that will help to make the best use of AI and other innovations in accounting and finance.

**Acquiring data analytics skills.** Gaining data analytics skills is becoming a cornerstone for finance and accounting professionals, enabling them to analyze and interpret large data sets to extract meaningful insights that help inform decisions. In addition, acquiring proficiency in data visualization tools and techniques enhances their ability to communicate faster insights. A recent LinkedIn poll of finance professionals showed that 86% of respondents agree that Excel-based visualizations are still preferred due to their flexibility and features. This preference for Microsoft Excel over specialized data visualization tools such as Power BI and Tableau is possibly due to its familiarity, accessibility, ease of use, and flexibility for ad hoc reporting. The interface of Excel is user-friendly, and extensive customization options make it a go-to choice for creating quick reports and conducting fast analyses. It can also be accessed offline, which most likely contributes to its popularity. Organizations often adopt a hybrid approach to harness long-term benefits in complex data analytics and visualization, combining Excel for ad hoc tasks with specialized tools such as Power BI and Tableau for comprehensive data management, automation, and visualization. This will achieve a balance between flexibility and advanced capabilities.

**Learning structured query language (SQL) and coding.** Finance professionals are required to extract data from a database to perform analysis. This requires an understanding of SQL and primary coding languages such as Python and R. These skills are available because they allow finance professionals to manipulate data, automate processes, and develop custom solutions for their required analytical needs.

**Embracing AI and machine learning.** Future finance professionals are taking courses to familiarize themselves with AI and machine learning concepts. They don't need to become experts in developing AI algorithms, but they do need to understand how AI works. It can also position them to collaborate effectively with data scientists and IT teams.

**Adopting automation tools.** The finance team is learning to use RPA tools to streamline repetitive tasks, reduce errors, and increase efficiency. Some familiarity with automation platforms helps them to deal with automated processes and also to identify processes that can be automated and implemented with RPA solutions.

**Enhancing communication and collaboration.** These technologies facilitate real-time collaboration, and professionals are honing their communication and teamwork skills. This will help them work seamlessly across departments and collaborate with cross-functional teams.

**Staying current with regulatory changes.** Professionals must continuously update their knowledge of industry regulations and compliance requirements. They must understand innovation-related legal and ethical standards to ensure accurate financial reporting and risk management.

**Developing a leadership and innovation mindset.** To prepare for the future, finance and accounting professionals are developing leadership skills and an innovation mindset. This will allow them to embrace change and seek opportunities to drive innovation within their organizations and position themselves as forward-thinking strategists.

## Activities Not Impacted by AI

There are certain areas in finance and accounting that are less impacted by AI due to the nature of the tasks involved. These areas include strategic decision making, relationship management, complex financial analysis, regulatory compliance, and innovative problem solving (see "Least-Impacted Activities"). While AI can provide valuable data-driven insights, strategic decision making relies on human judgment because of contextual understanding and the ability to evaluate nonquantitative considerations. Relationship management is also critical for client and stakeholder interactions that hinge on interpersonal skills and human empathy that AI can't replicate. Similarly, complex financial analysis demands in-depth expertise and interpretation, and, even with AI assistance, the human touch remains indispensable. Also, regulatory compliance requires the correct interpretation of complex regulations, which goes beyond AI's capabilities right now. Finally, innovative problem solving often involves creative thinking, considering unconventional solutions, and adapting to dynamic situations.

In this fast-moving, dynamic environment, future finance and accounting professionals are actively preparing for the impact of innovative processes by acquiring diverse skills, from data analytics and coding to leadership strategies and an innovation mindset. Finance and accounting professionals must position themselves to make the best use of AI and other innovations in accounting and finance. Therefore, by combining technical expertise, a strategic mindset, and strong interpersonal skills, they'll be poised to excel in this landscape.

AI and other innovative technologies have the unwavering potential to revolutionize finance and accounting. They automate routine tasks, enhance analysis, and improve decision making. Yet some challenges and impacts aren't uniform across all aspects of the field. This will require agility to present themselves as flexible enough to surmount these challenges. The successful integration of AI requires a comprehensive approach, a broader understanding that addresses several considerations around technical tasks, ethical

## Least-Impacted Activities

- Strategic decisions often require different perspectives, human judgment, and contextual understanding.
- Building and maintaining relationships with stakeholders remain largely human-centric.
- Financial analysis that requires interpretation will rely heavily on human expertise.
- Understanding complex regulations will require academic knowledge and human involvement.
- Creative and innovative problem solving often comes from creativity and ingenuity limited to humans.

## Further Reading


Cameron Putty, Automating Data Entry with AI, Thoughtful, August 22, 2023.

Trintech, *Global Record to Report Benchmark Report*, 2020.

Gary Waylett, Is It Possible to Achieve Fully Automated Bank Reconciliations? *BlackLine Magazine*, January 17, 2021.

MarketsandMarkets, *Artificial Intelligence in Accounting Market by Component, Deployment Mode, Technology, Enterprise Size, Application (Automated Bookkeeping, Fraud and Risk Management, and Invoice Classification and Approvals), and Region – Global Forecast to 2024*.

Marco Porru, Implement SAP S/4HANA Quality Control of Goods Receipt with SAP Internet of Things, Smart Sensing, SAP, October 18, 2021.

Transformative technologies (AI) challenges and principles of regulation, Digital Regulation Platform, August 9, 2023.

Neil Perry, Top 10: Generative AI platforms in procurement, Procurement, August 1, 2023.

standards, and organizational culture, and simultaneously capitalizing on the strengths of technology and human expertise.

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STRATEGIC FINANCE

# Accounting in the Age of Generative AI

Accounting and finance professionals can benefit from ChatGPT, but they must take steps to mitigate the risks.

**By Tala Khalifeh, CMA**

Although we might not realize it, AI has been around for decades. It started with basic systems such as machine learning capable of following instructions and storing commands to assist humans with their tasks. AI has developed so much that it now simulates the thought processes, creativity, and intelligence of real people (see "Timeline of AI"). With the rise of ChatGPT, among other new software/applications related to this field, a lot of attention is being focused on generative AI and its impact on jobs. There are also serious implications for the finance function and the management accounting profession.

According to OpenAI, the company that developed ChatGPT, "ChatGPT is a sibling model to InstructGPT, which is trained to follow an instruction in a prompt and provide a detailed response." It's a natural language processing tool that allows us to have human-like conversations, like answering questions, and assists with tasks, such as composing emails, essays, and writing codes.

# TIMELINE OF AI

## 1950s

The terms “artificial intelligence” and “machine learning” emerge.

## 1960s

Eliza, the chatbot with cognitive abilities, and Shakey, the first mobile intelligent robot, are created.

## 1970s and 1980s

Symbolics Lisp machines are commercialized, signaling an AI renaissance.

## 1989

Convolutional neural networks (CNNs) prove AI can be used to recognize handwritten characters, implying that neural networks could be applied to real-world problems.

## 1997

Recurrent neural networks, which could process entire sequences of data such as speech or video, are proposed.

## 2013

Tianhe-2, the world’s fastest system for the third consecutive time, doubles the world’s top supercomputing speed at 33.86 petaflops.

DeepMind introduces deep reinforcement learning, a CNN that learned based on rewards and learned to play games through repetition, surpassing human expert levels.

Word2vec automatically identifies semantic relationships between words.

## 2014

Generative adversarial networks, a class of machine learning frameworks used to generate photos, transform images, and create deepfakes, is invented. Facebook develops DeepFace, the deep-learning facial recognition system.

## 2018

Cimon is the first robot sent into space to assist astronauts. It was developed by IBM, Airbus, and the German Aerospace Center DLR.

OpenAI releases GPT (Generative Pre-trained Transformer).

**2019**

Microsoft launches the Turing Natural Language Generation generative language model.

**2020**

Open AI releases the GPT-3 LLM, consisting of 175 billion parameters to generate humanlike text models.

**2022**

OpenAI releases ChatGPT.

**2023**

OpenAI announces ChatGPT-4.

Source: Ron Karjian, The history of artificial intelligence: Complete AI timeline, TechTarget, August 16, 2023.

Some perceive ChatGPT as a positive emerging technology that can be beneficial to humans in many ways. Others still consider it a threat that might take away jobs. The positive opinions focus on the fact that AI makes work more efficient since it enhances automation, speeds up work as it frees up employees from automated and redundant tasks, improves data analyses, spots trend and outliers in data, enhances communication with customers and stakeholders while also increasing credibility and trust, and helps to brainstorm and generate new ideas (see "Top 10 Use Cases of ChatGPT for CFOs").

Perhaps the biggest criticism of this new technology is that ChatGPT gives false answers and lacks common sense (see "Downsides of AI"). Another downside in relation to finance is that ChatGPT lacks the vision and mission of

## Top 10 Use Cases of ChatGPT for CFOs

**1.** Analyze historical data for better financial decision making.

**2.** Identify and forecast financial trends.

**3.** Conduct financial analysis.

**4.** Ensure compliance with different types of rules and regulations.

**5.** Write source code.

**6.** Assist in tax preparation: provide guidance on new tax laws and regulations, identify deductions, and calculate preliminary tax liability.

**7.** Take on repetitive, time-consuming tasks.

**8.** Assist in preparing reports and related footnotes: income statements, cash flow reports, and balance sheets.

**9.** Assist in bookkeeping: data entry, invoice processing, and accounts reconciliation.

**10.** Assist in client communication to enhance customer relationships.

the organization that's using the technology, which can greatly impact decision making as well as financial analyses.

The challenge faced by users, especially when asking ChatGPT to answer exam questions, for example, is the format or approach. Users are required to introduce information, and some of the formats (especially tables) can be misinterpreted by ChatGPT or read incorrectly. As a result, ChatGPT gives wrong answers. The first condition to get an accurate response is to send the data and instructions in a way that the software can easily read. We tried to give the software accounting exercises with tables that contain data, but apparently, they weren't correctly read and understood. On the other hand, when we changed the format and introduced the information in text, the answers were much more accurate. (See "Tips and Tricks to Use to Enhance the Accuracy of ChatGPT's Answers.")

Given all of the above, can accounting and finance professionals benefit from ChatGPT in a way that limits the impact of the downsides? Yes.

## How Can ChatGPT Be Used in Accounting?

I conducted an interview with ChatGPT out of curiosity—before its May 2023 update—to see what it had to say and to test its accuracy regarding accounting. I conducted another interview after the update and noticed a difference in the answer. The first question I had in mind was "How can ChatGPT assist accountants?" The answer I received was accurate yet incomplete (see Figure 1).

The updated version of ChatGPT gave a clearer and more complete and concise answer (see Figure 2). However, this technology is still a work in progress, which is why critics say we can't rely on it solely.

## Downsides of AI

- AI provides an answer every time, even when it isn't sure of the answer. For instance, if you submit an accounting exercise containing data in tables, ChatGPT provides an incorrect answer because it can't understand data presented in a table format.AI lacks common sense. This affects the way accountants work. This criterion can't be dismissed.
- AI lacks emotional intelligence. This can't currently be tested or taught. Lack of emotional intelligence may render some AI answers unreliable.

## Tips and Tricks to Use to Enhance the Accuracy of ChatGPT's Answers

**1.** Submit information in an easily readable format, such as a paragraph, and avoid tables or any graphical representation.

**2.** Use simple, clear, and concise language.

**3.** Use proper grammar and punctuation.

**4.** Use specific keywords.

**5.** Provide details as much as possible.

**6.** Use correct spelling.

**7.** Divide tasks into simple, smaller tasks.

**8.** Ensure you have high-quality data by:

  **a.** Removing irrelevant information.

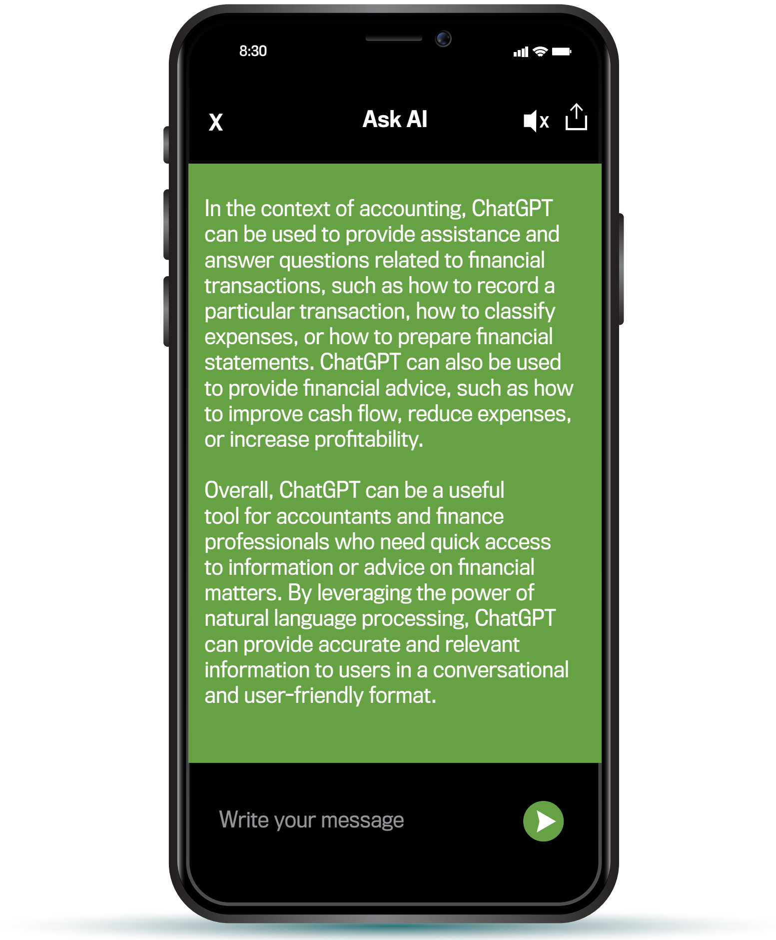
  **b.** Removing duplicate entries.

  **c.** Standardizing the format.

**9.** Define the evaluation metrics to be used to assess the accuracy of the results.

**10.** Assess the results' accuracy. If you have a big data set, test ChatGPT's results with a small data set first.

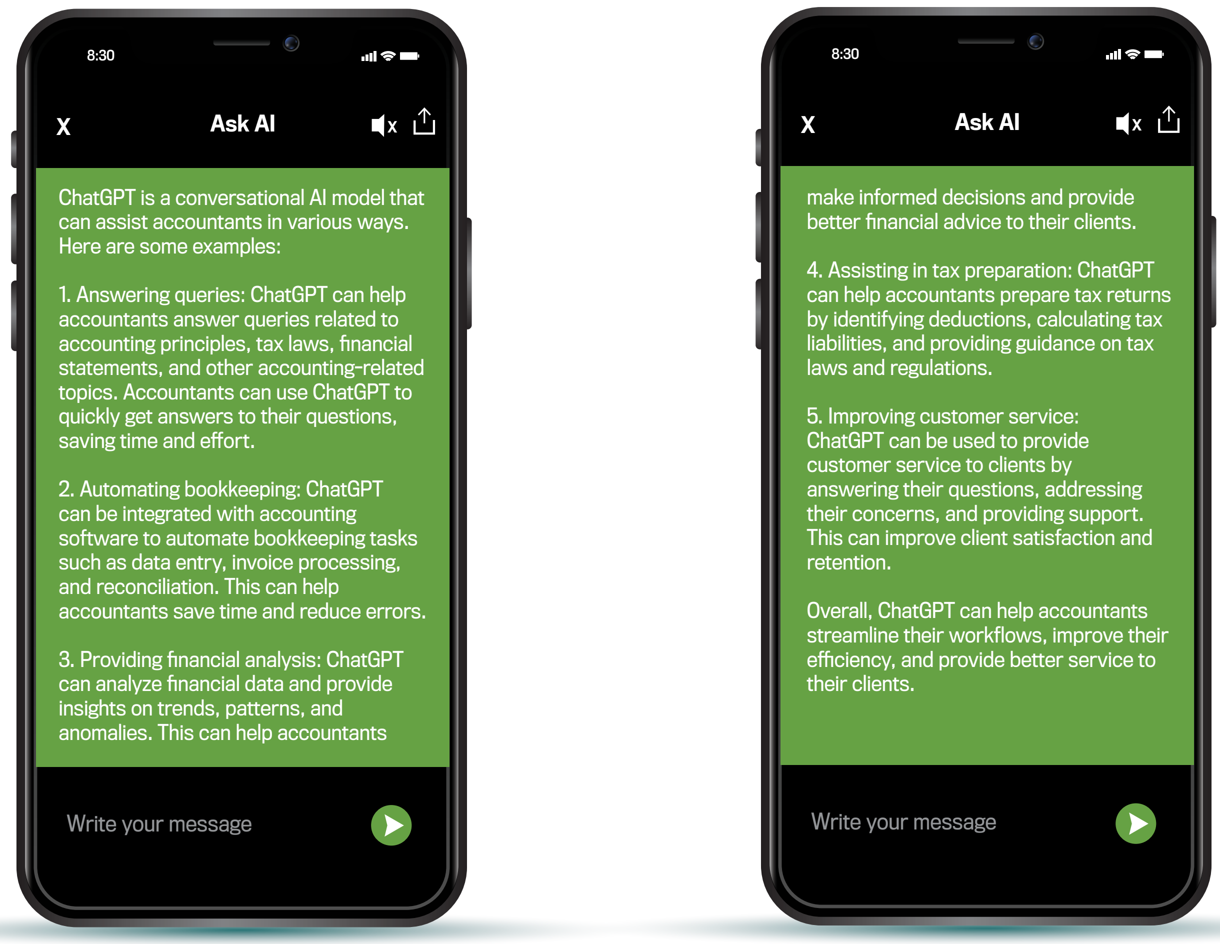
## FIGURE 1: ANSWERS ON MAY 14, 2023




According to ChatGPT, its competitive advantage is that it provides relevant information in a conversational and user-friendly format. Studies have already shown that ChatGPT can take on time-consuming and repetitive tasks, such as processing invoices, reconciling accounts, creating financial reports, extracting data from financial documents, categorizing transactions, generating financial projections, and composing audit reports. By handling these tasks, ChatGPT gives accountants more time to spend on more valuable tasks to enhance their efficiency and boost their productivity. AI can also enhance footnotes and comments sections in financial reports, making them more readable for stakeholders and third parties.

ChatGPT said it can help identify potential risks and opportunities as well as provide risk analysis in financial markets by analyzing market trends and economic indicators. It can also provide decision-making support through analyzing financial data and provide insights that can help businesses make informed decisions. ChatGPT is also being promoted for its ability to provide analysis of investment opportunities, including evaluating the financial performance of companies, assessing the risks associated with investment options, and identifying potential investment opportunities. These tasks can directly impact CFOs, controllers, management accountants, and other finance professionals in their decision making, since getting information related to financial markets, trends, financial analysis, and competitors in the industry takes

## FIGURE 2: ANSWERS ON JUNE 18, 2023




considerable time to gather or might be incomplete. Therefore, ChatGPT saves time by helping finance professionals focus more on analysis and evaluation related to decision making rather than data generation. This will positively impact the quality and accuracy of decisions made.

## ChatGPT and the CPA Exam

In early 2023, ChatGPT 3.5 failed the CPA (Certified Public Accountant) exam. This led accountants to believe the technology couldn't interpret information vital to an accountant's job. ChatGPT retook the CPA exam in May 2023 and passed it with a score of 85.1 compared to 53.1 out of 100. The second attempt was run by ChatGPT 4.0, which was provided with examples. This newer version of ChatGPT was better equipped with training and reasoning capabilities even though it performed worst in the "financial accounting and reporting" section.

This result provides some insights into what makes ChatGPT most successful. You can't rely on ChatGPT's answers without first providing the software with information it can understand and making sure it's well equipped with the right learning tools and clear instructions in order for it to generate an accurate and credible response. As much as this technology is helpful, it still needs human intervention and support to be used properly.

I have asked ChatGPT, "Why did you fail the CPA exam?" ChatGPT stated that it can only provide answers to CPA questions to the best of its ability and that it depends on the information learned from its training data set. ChatGPT also listed some of the possible causes of failure (see "Why Did ChatGPT Fail the CPA Exam?"). This answer was convincing, which made me believe that the enhancements in the newest version greatly upgraded the abilities of the software (ChatGPT 4.0).

I also asked ChatGPT about its limitations related to accounting tasks. Although AI can generate responses based on patterns, it may lack the specialized knowledge and expertise required to answer complex accounting questions due to accounting's many specific rules, regulations, and principles that govern how financial transactions should be recorded, reported, and analyzed. These rules and principles may be complex and may vary, especially if they're country- or industry-specific. Therefore, ChatGPT might not have the domain-specific knowledge needed to answer questions or perform tasks correctly. Also keep in mind that accounting involves the use of specialized software and tools such as spreadsheets and accounting software. AI might not be able to interact with these tools properly, which will eventually limit its ability to perform accounting tasks.

ChatGPT ended the conversation by stating that it's an AI language model and should be used as a tool to supplement human decision making and not replace it.

## Why Did ChapGPT Fail the CPA Exam?

ChatGPT listed the possible reasons it failed the CPA exam:

- Lack of context: ChatGPT may not have had enough context to fully understand a question. This could also be related to the format of the information provided.
- Limitations in training data: While ChatGPT has been well trained, it still may not have been exposed to all the possible variations and complexities of CPA questions.
- Incomplete or inaccurate information: Instructions ChatGPT received could have been incomplete. The format also plays a significant role in its ability to understand the content.
- Human error: Errors such as typos can occur in the input.

## What People Are Saying about ChatGPT

Opinions on ChatGPT vary, even among financial experts. "ChatGPT is a great productivity enhancer. It can speed up any task that requires research and analysis or content creation," says Aaron Harris, chief technology officer of Sage, which provides businesses with payroll, HR, and finance software and services.

Harris says this technology's greatest power is its ability to convert complex instructions into a set of tasks. On the other hand, he said that even if ChatGPT has what it takes to execute accounting and finance tasks, human review is still needed. "[ChatGPT] will enable professionals to create more and more valuable reports," Harris says. "It will increase the quality of data analysis. However, human accountability is still central to credibility. AI won't be signing audit reports any time soon."

Jason Averbook, senior partner and global leader of digital HR strategy at Mercer, which provides human resources and financial consulting services, has a different take on ChatGPT. He questions the benefits of ChatGPT on the work of CFOs and says that CFOs who implement an autonomous finance function will significantly be impacted by ChatGPT. "CFOs should use their unique risk-focused perspective to push for, and help, shape a policy at the organizational level that mitigates the risks posed by unrestricted use of ChatGPT, including output quality risks, data security and regulatory risks, as well as their downstream implications," Averbook says. In other words, CFOs can add prerequisites to use ChatGPT within the finance function depending on the risks the software can pose and try to mitigate them while still benefiting from this technology.

Even though Averbook considers this technology to be of great added value, he says he sees some limitations related to the finance unit. For example, ChatGPT can help generate software code or structured query language statements but can't answer questions about financials because it can only answer questions it was trained to answer; it can't provide accurate feedback to answer financial questions or give any financial advice due to a lack of insight into the vision and mission of a given organization as well as other necessary components needed for accurate decision making.

Averbook says leaders should focus on transitioning culture and skills toward using this advanced technology and training their team members to acquire the skills to use this technology the right way. "Finance is just about keeping pace with the bare minimum of running the business and meeting regulatory requirements," he says. AI, on the other hand, can raise that bar and enhance human productivity to help employees work more on strategic tasks in the company. This shows how roles might be shifting due to AI assigning humans better things to do. Leveraging AI is becoming a very important skill that employees need in order to establish a competitive advantage in the market and stand out to employers. So, AI won't replace people but might cause a threat to those who don't use and learn it as it's becoming the more efficient and productive way to conduct business. This technology shouldn't replace people but rather should increase the scope of work accomplished by them.

Averbook says the best way to work with any AI tool or machine is by not expecting too much from it and to not give it too much control. Unfortunately, finance leaders tend to expect more from AI than they do from humans. This might create risk due to insufficient oversight and control. Instead, finance leaders shouldn't expect perfection or too much from a machine and assign specific tasks to AI, then check the outcome in order to enhance AI-related processes.

Neil Taurins, general manager of community brands for MIP Fund Accounting, assists nonprofit organizations and has been incorporating AI into MIP's accounting software to help accountants become more efficient. Taurins says accountants should be excited about the potential of this technology for their day-to-day functions. He also says even though this technology can streamline some accounting tasks, human accountants will remain indispensable due to their specialized knowledge, vision, discernment, and contextual comprehension that AI lacks. Accountants might just need to adjust their skills and embrace AI tools to expedite their daily repetitive and redundant work. ChatGPT might also be helpful in fraud detection and forecasting.

Anders Fohlin, CFO of Medius, which develops accounts payable automation and global payment software, says ChatGPT and other large language models (LLMs) have the potential to revolutionize accounting and all the other functions of a company. LLMs can alleviate time-consuming and outdated processes such as invoice analysis, inventory data, account coding, and manual data entry into systems (e.g., enterprise resource planning systems and Excel spreadsheets) and take over repetitive and manual tasks more accurately and more quickly compared to humans. Fohlin also says ChatGPT can help in data analysis (e.g., decoding statistics, crunching numbers, and flagging key paradigms), but it won't be able to take over abstract problem solving unless it's rule-based. The recent Medius report *The Financial Professional Census* found that 62% of 2,750 senior finance executives believe that the technology they currently use is outdated, while ChatGPT can be useful.

Fohlin says the idea that ChatGPT poses a threat to jobs within the tech industry isn't founded on anything concrete. The Medius research found that 24% of financial professionals were at risk of leaving their jobs because of a workload primarily dominated by monotonous, boring tasks that are simply demotivating and not challenging enough.

Ultimately, every organization is responsible for keeping within legal boundaries, a responsibility that can't be outsourced. Fohlin also considers data privacy to be paramount. Those using AI software must understand that while humans know they're sharing information with third parties and the agreed-upon terms and conditions, ChatGPT lacks that ability, which is a clear limitation. "AI models like ChatGPT are complex, and in many cases often referred to as 'black boxes' because their decision-making process can be so challenging to understand," Fohlin says. "To avoid ethical dilemmas from the onset, companies need to ensure AI-generated outputs are auditable, justifiable, and understandable to maintain trust."

Gerald Ratigan, senior vice president of accounting and controls of The Gearbox Entertainment Company, points out that companies must take ethics into consideration when implementing AI. "ChatGPT offers the ability to achieve increases in efficiency and effectiveness across many processes. It could even replace people in certain use cases. Therefore, it is paramount to perform a risk assessment to address growing ethical considerations during implementation. With the increasing usage of ChatGPT, companies must act now to implement strong governance to maintain an appropriate level of risk management. First steps should be to establish clear policies and procedures to mitigate growing bias and safety risks. Forward-thinking companies have even created committees to continuously monitor inputs and outputs of ChatGPT."

## Looking toward the Future

The world evolves daily at a fast pace, and we should be quickly adapting with it. Google launched its own AI software: Palm 2, a generative AI chatbot similar to ChatGPT; Med-PaLM, which can answer medical questions and has an accuracy rating of around 85%; and advancements to Bard and Search, which are used for coding, math, and logic, and are also expanding to Japanese and Korean languages. Microsoft is also working to enhance its search engine, Bing, by incorporating a generative AI chatbot technology into its products. (See "AI in the Future.")

Like any other new skill or technology, ChatGPT provides us with another opportunity to think outside the box. Finance professionals have the opportunity to work proactively with AI to optimize benefits and minimize the harm associated with it. Humans and machines can complement each other to achieve better outcomes.

It should be apparent that this technology can impact workers' daily lives and skill sets and improve the overall economy. AI is being used more widely each day to enhance existing applications, software, and search engines in increasingly sophisticated ways.

## AI in the Future

Katta Andersson, vice president of data capture at Medius, provides some insights regarding what to expect from AI in the future. Andersson says AI helps Medius ensure that businesses receive market-leading intelligent automation today and for the foreseeable future without the need to maintain configurations or templates.

AI enhances the detection of anomalies in the accounting process to figure out the necessary safeguards to ensure time and money are effectively and wisely spent, Andersson says. AI helps to protect businesses against external and internal frauds due to its ability to identify changes in behavior and abnormal activities. All of this will eventually lead organizations to become more strategic instead of reactive in their accounting approach, which will help in removing mundane and repetitive tasks.

Andersson says that AI "will help Medius make businesses and accounts payable departments in particular become more intelligently automated every day."

AI's support also extends to helping employees in the strategic decision-making process through the usage of chatbots, which can aid businesses in analyzing all financial data.

## Alternatives to ChatGPT

- Google Bard
- Anthropic's Claude 2
- GitHub's CoPilot
- Adobe's Firefly
- Otter AI Chat
- Jasper.ai
- Meta's Llama 2
- HeyPi

But finance professionals and management accountants have nothing to worry about: They're already seizing the opportunity to allocate more room for financial analysis and decisions, process improvement, working capital management enhancement, costing accuracy enhancement, profitability measurement, and much more.

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**Tala Khalifeh**, CMA, is an accountant, vice chair of IMA's Committee on Ethics, and a member of IMA's Lebanon Chapter. You can reach her at khalife.tala@gmail.com.


# Stale Value Formatting in Excel

Manual calculation mode in Excel hasn't changed in 44 years. A new formatting feature shows which cells need to recalculate.

By Bill Jelen

Manual calculation mode debuted in VisiCalc in 1979 and hasn't been changed in 44 years. When you change the calculation mode to Manual, Excel will stop calculating. This can be useful to allow you to perform data entry without having a long delay to calculate cells after each entry.

When you're in Manual calculation mode, Excel keeps track of which cells are out of date and need to be recalculated. These cells are called "stale" by Microsoft. With the new feature, you can choose to format stale values. Excel will add strikethrough to all cells that need to be recalculated.

There are two places to choose the calculation mode. You can either use the Calculation Options drop-down menu on the Formulas tab (Figure 1) or select File, Options, Formulas. In Figure 1, the calculation mode is changed to Manual and the new Format Stale Values option is enabled.

**Note:** The calculation mode formerly called "Automatic Except Tables" is being renamed to "Partial." This mode is used to pause calculation in Data Tables created using What-If tools. The

Python programming language is being added to Excel. Microsoft needed a method to pause Python calculations so it changed the meaning of "Automatic Except Tables" to "Automatic Except Tables and Python." But this was deemed too wordy, so the option is now called Partial.

**Caution:** Calculation mode is a global setting. If you have several workbooks open and change one workbook from Automatic to Manual, that setting will be applied to all open workbooks.

To illustrate the Format Stale Values feature, I've built a simple forecasting worksheet as shown in Figure 2. Enter predicted sales in the January column, and the model will calculate future sales by adding 10% each month. A Total row, Running Total row, and Total column are included to help illustrate which values are stale.

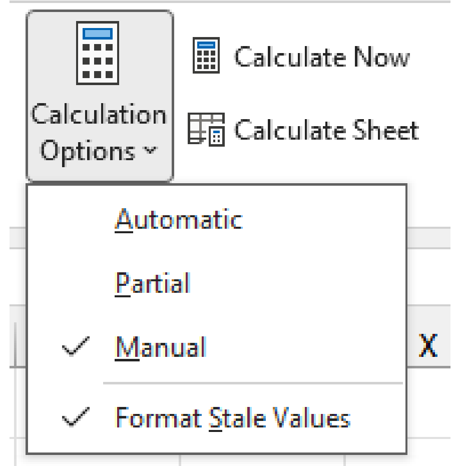



***Figure 1***

D4 =ROUND(C4*1.1,-1)

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | Manual Calculation Mode & Stale Value Formatting | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | |
| 3 | | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
| 4 | | Andy | 300 | 330 | 360 | 400 | 440 | 480 | 530 | 580 | 640 | 700 | 770 | 850 | 6380 |
| 5 | | Barb | 900 | 990 | 1090 | 1200 | 1320 | 1450 | 1600 | 1760 | 1940 | 2130 | 2340 | 2570 | 19290 |
| 6 | | Chris | 650 | 720 | 790 | 870 | 960 | 1060 | 1170 | 1290 | 1420 | 1560 | 1720 | 1890 | 14100 |
| 7 | | Diane | 270 | 300 | 330 | 360 | 400 | 440 | 480 | 530 | 580 | 640 | 700 | 770 | 5800 |
| 8 | | Ed | 900 | 990 | 1090 | 1200 | 1320 | 1450 | 1600 | 1760 | 1940 | 2130 | 2340 | 2570 | 19290 |
| 9 | | Flo | 180 | 200 | 220 | 240 | 260 | 290 | 320 | 350 | 390 | 430 | 470 | 520 | 3870 |
| 10 | | Gary | 555 | 610 | 670 | 740 | 810 | 890 | 980 | 1080 | 1190 | 1310 | 1440 | 1580 | 11855 |
| 11 | | Hank | 190 | 210 | 230 | 250 | 280 | 310 | 340 | 370 | 410 | 450 | 500 | 550 | 4090 |
| 12 | | Ike | 250 | 280 | 310 | 340 | 370 | 410 | 450 | 500 | 550 | 610 | 670 | 740 | 5480 |
| 13 | | Jake | 500 | 550 | 610 | 670 | 740 | 810 | 890 | 980 | 1080 | 1190 | 1310 | 1440 | 10770 |
| 14 | | Total | 4695 | 5180 | 5700 | 6270 | 6900 | 7590 | 8360 | 9200 | 10140 | 11150 | 12260 | 13480 | 100925 |
| 15 | | Running Total | 4695 | 9875 | 15575 | 21845 | 28745 | 36335 | 44695 | 53895 | 64035 | 75185 | 87445 | 100925 | |
| 16 | | | | | | | | | | | | | | | |

***Figure 2***

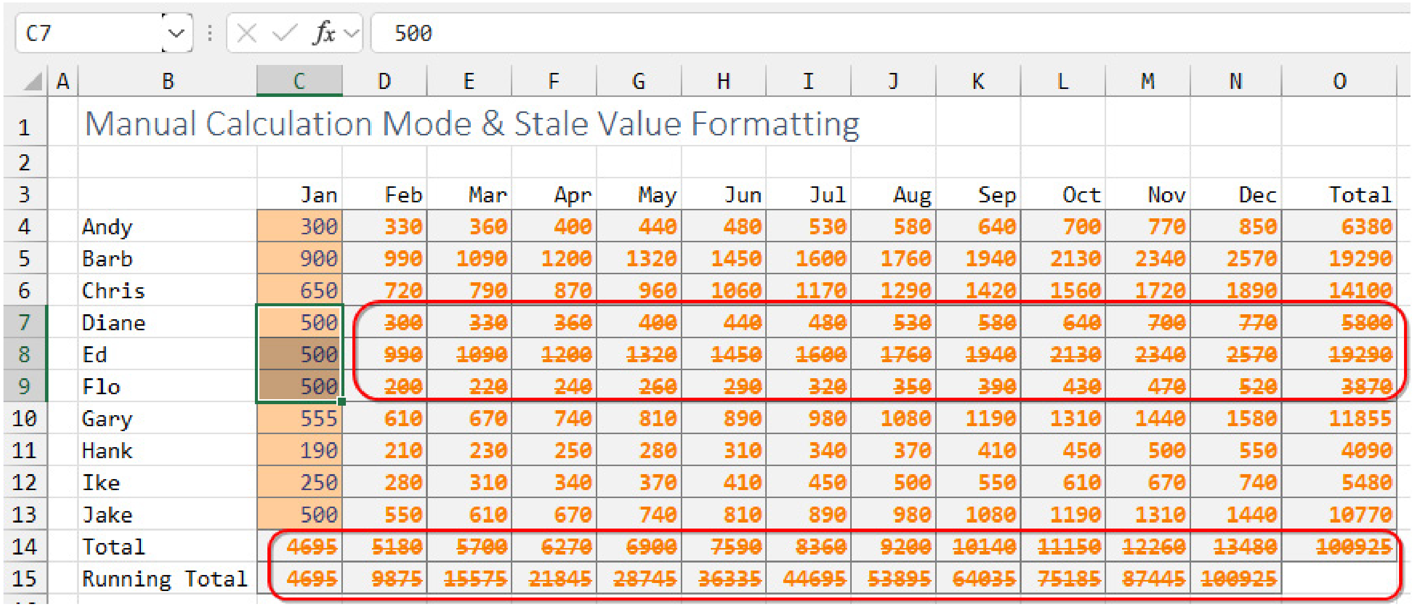
In Figure 3, I've changed the January sales for Diane, Ed, and Flo to 500. Excel applies strikethrough to D7:O9 and also to the Totals and Running Totals in rows 14 and 15.

**Note:** I'm a frequent user of the Ctrl+5 shortcut to apply strikethrough to a cell. As someone who frequently uses strikethrough, I don't particularly like that Microsoft chose strikethrough as the indicator for stale values. I've requested an option to change how Excel formats stale values. But for this current version of the feature, there's no way to choose which formatting is applied to stale values. We're stuck with strikethrough.

If you select a cell that contains a stale value, a yellow triangle symbol appears next to the cell. Open the drop-down menu, and you have choices to Calculate Now, Switch to Automatic Calculation, Disable Format Stale Cells, or Ignore Error for this cell (see Figure 4).

## Stale Values in Automatic Calculation Mode

There can be cases where you'll see stale values even if you're using Automatic calculation mode. To test this, I built a worksheet with 20 RANDBETWEEN functions and 20 million formulas based on those 20 random cells. If you press F9 to generate new random numbers, the Excel status bar will show the progress of the calculation. Figure 5 shows the spreadsheet is 24% complete with the calculation.



C7 | 500

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | Manual Calculation Mode & Stale Value Formatting | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | |
| 3 | | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
| 4 | | Andy | 300 | 330 | 360 | 400 | 440 | 480 | 530 | 580 | 640 | 700 | 770 | 850 | 6380 |
| 5 | | Barb | 900 | 990 | 1090 | 1200 | 1320 | 1450 | 1600 | 1760 | 1940 | 2130 | 2340 | 2570 | 19290 |
| 6 | | Chris | 650 | 720 | 790 | 870 | 960 | 1060 | 1170 | 1290 | 1420 | 1560 | 1720 | 1890 | 14100 |
| 7 | | Diane | 500 | ~~300~~ | ~~330~~ | ~~360~~ | ~~400~~ | ~~440~~ | ~~480~~ | ~~530~~ | ~~580~~ | ~~640~~ | ~~700~~ | ~~770~~ | ~~5800~~ |
| 8 | | Ed | 500 | ~~990~~ | ~~1090~~ | ~~1200~~ | ~~1320~~ | ~~1450~~ | ~~1600~~ | ~~1760~~ | ~~1940~~ | ~~2130~~ | ~~2340~~ | ~~2570~~ | ~~19290~~ |
| 9 | | Flo | 500 | ~~200~~ | ~~220~~ | ~~240~~ | ~~260~~ | ~~290~~ | ~~320~~ | ~~350~~ | ~~390~~ | ~~430~~ | ~~470~~ | ~~520~~ | ~~3870~~ |
| 10 | | Gary | 555 | 610 | 670 | 740 | 810 | 890 | 980 | 1080 | 1190 | 1310 | 1440 | 1580 | 11855 |
| 11 | | Hank | 190 | 210 | 230 | 250 | 280 | 310 | 340 | 370 | 410 | 450 | 500 | 550 | 4090 |
| 12 | | Ike | 250 | 280 | 310 | 340 | 370 | 410 | 450 | 500 | 550 | 610 | 670 | 740 | 5480 |
| 13 | | Jake | 500 | 550 | 610 | 670 | 740 | 810 | 890 | 980 | 1080 | 1190 | 1310 | 1440 | 10770 |
| 14 | | Total | ~~4695~~ | ~~5180~~ | ~~5700~~ | ~~6270~~ | ~~6900~~ | ~~7590~~ | ~~8360~~ | ~~9200~~ | ~~10140~~ | ~~11150~~ | ~~12260~~ | ~~13480~~ | ~~100925~~ |
| 15 | | Running Total | ~~4695~~ | ~~9875~~ | ~~15575~~ | ~~21845~~ | ~~28745~~ | ~~36335~~ | ~~44695~~ | ~~53895~~ | ~~64035~~ | ~~75185~~ | ~~87445~~ | ~~100925~~ | |

*Figure 3*

If you press the Esc key, Excel will temporarily pause the calculation, and all of the uncalculated cells will show the stale value formatting, as shown in Figure 6.

After pressing the Esc key, you can prevent Excel from calculating by rapidly entering values in new cells. But as soon as you pause your data entry for a few seconds, Excel will automatically begin calculating.

## Python, Data Tables, and Partial Calculation Mode

There is a What-If Analysis drop-down on the Data tab in the Excel ribbon. As shown in Figure 7, the third choice in this drop-down menu is called Data Table, which allows you to perform sensitivity analyses.

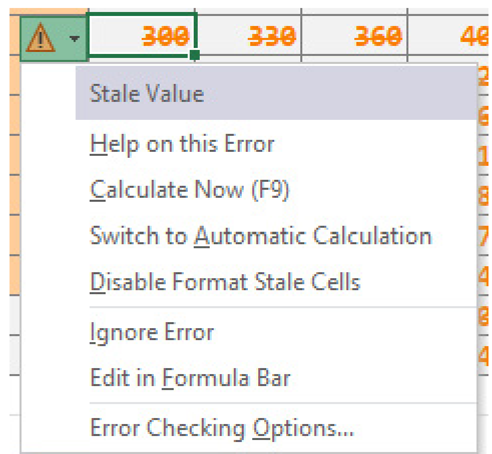



*Figure 4*

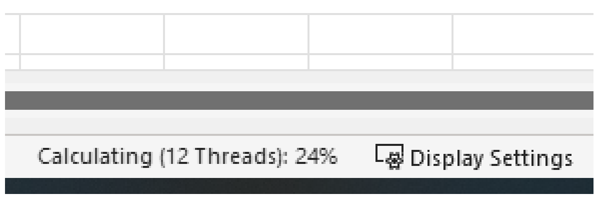
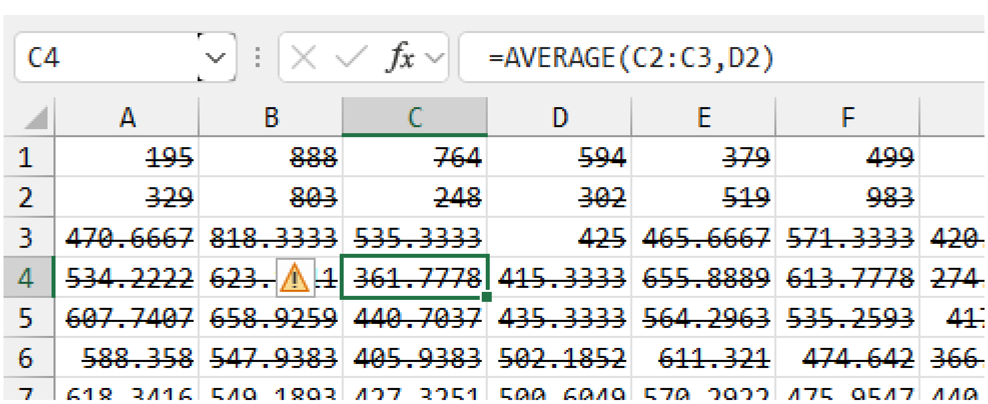



*Figure 5*



C4 | =AVERAGE(C2:C3,D2)

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | ~~195~~ | ~~888~~ | ~~764~~ | ~~594~~ | ~~379~~ | ~~499~~ |
| 2 | ~~329~~ | ~~803~~ | ~~248~~ | ~~302~~ | ~~519~~ | ~~983~~ |
| 3 | ~~470.6667~~ | ~~818.3333~~ | ~~535.3333~~ | ~~425~~ | ~~465.6667~~ | ~~571.3333~~ |
| 4 | ~~534.2222~~ | ~~623.~~ [illegible] ~~1~~ | ~~361.7778~~ | ~~415.3333~~ | ~~655.8889~~ | ~~613.7778~~ |
| 5 | ~~607.7407~~ | ~~658.9259~~ | ~~440.7037~~ | ~~435.3333~~ | ~~564.2963~~ | ~~535.2593~~ |
| 6 | ~~588.358~~ | ~~547.9383~~ | ~~405.9383~~ | ~~502.1852~~ | ~~611.321~~ | ~~474.642~~ |
| 7 | ~~618.3416~~ | ~~549.1893~~ | ~~427.3251~~ | ~~500.6049~~ | ~~570.2922~~ | ~~475.9547~~ |

*Figure 6*

In Figure 8, a simple model in C18:C21 accepts input values for Loan Amount, Term, and Interest Rate. A formula in C21 calculates the monthly payment.

To use the Data Table functionality, you'd enter various values for one input cell to the right of the monthly payment formula. These are the values shaded in blue in Figure 8. Below the monthly payment formula, enter various values for second input cells. These are shaded in green in Figure 8.

Select C21:J27 and then Formulas, What-If Analysis, Data Table. In the Data Table dialog box, you would specify that Excel should iterate through the values in the top row and place them in cell C18. The items along the left column would be placed in C19.

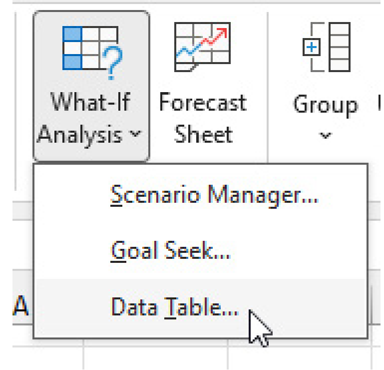



*Figure 7*

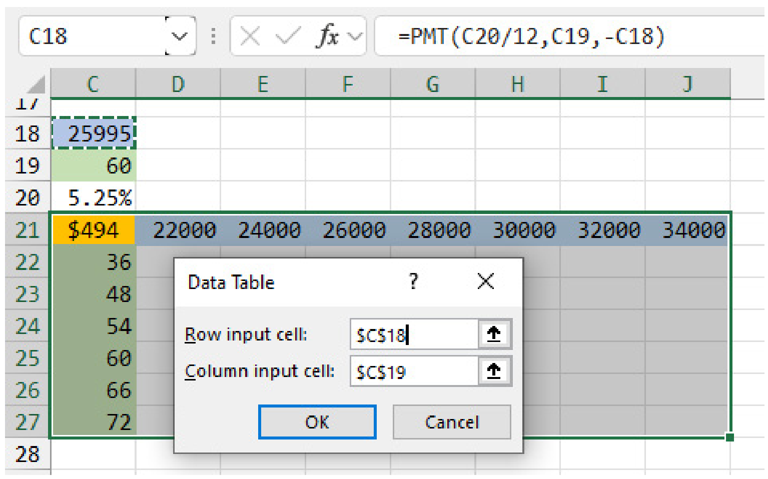
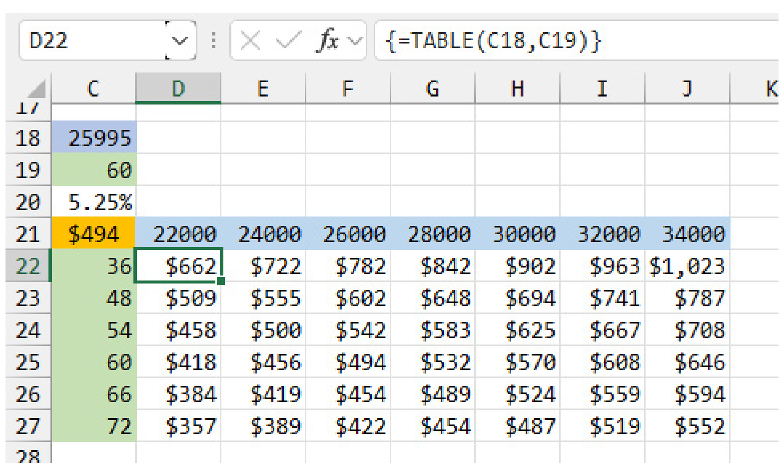



*Figure 8*

When you press OK, Excel will run this simple model with each combination of the six input cells along the left and the seven input cells across the top. This means the model will be calculated 42 times.

The result, shown in Figure 9, is a Table function that generates the monthly payment for various combinations of the two input cells.

Set the calculation mode to Partial. Type a new interest rate in cell C20. The formula in C21 is updated, but all of the results of the Table function are marked as stale values (see Figure 10). You can press F9 or click Calculate Now on the Formulas tab to calculate the table.




| | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|
| 18 | 25995 | | | | | | | |
| 19 | 60 | | | | | | | |
| 20 | 5.25% | | | | | | | |
| 21 | $494 | 22000 | 24000 | 26000 | 28000 | 30000 | 32000 | 34000 |
| 22 | 36 | $662 | $722 | $782 | $842 | $902 | $963 | $1,023 |
| 23 | 48 | $509 | $555 | $602 | $648 | $694 | $741 | $787 |
| 24 | 54 | $458 | $500 | $542 | $583 | $625 | $667 | $708 |
| 25 | 60 | $418 | $456 | $494 | $532 | $570 | $608 | $646 |
| 26 | 66 | $384 | $419 | $454 | $489 | $524 | $559 | $594 |
| 27 | 72 | $357 | $389 | $422 | $454 | $487 | $519 | $552 |

*Figure 9*

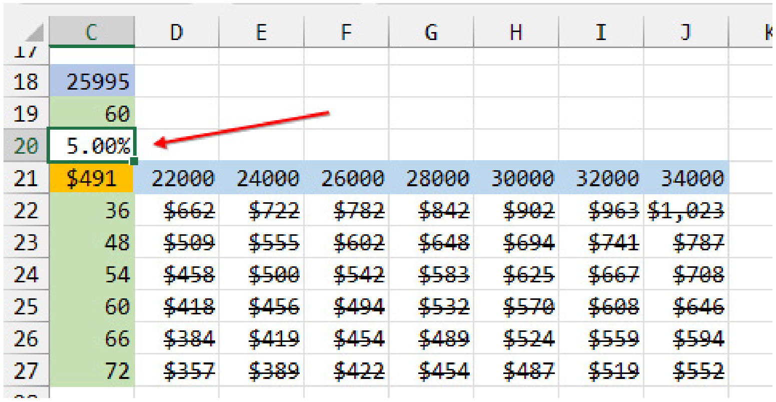



*Figure 10*

Note that the simple model shown above would normally calculate in less than a second. But it's possible to build complex models with thousands of formulas and then to build a table that runs thousands of formulas hundreds of times. The Partial calculation mode is particularly useful for these larger models.

Microsoft began rolling out a preview of Python built in to Excel in late August 2023. The Partial calculation mode will also pause calculation of any Python code in the workbook. Watch for an article about the Python preview in Excel in a future issue of *Strategic Finance*.

## Should These Really Be Stale?

Figure 11 shows a very simple scenario. Cell C38 has the value of 100. Select cells D38:K38. Type a formula to add 10 to the cell to the left. Fill the entire selection by pressing Ctrl+Enter.

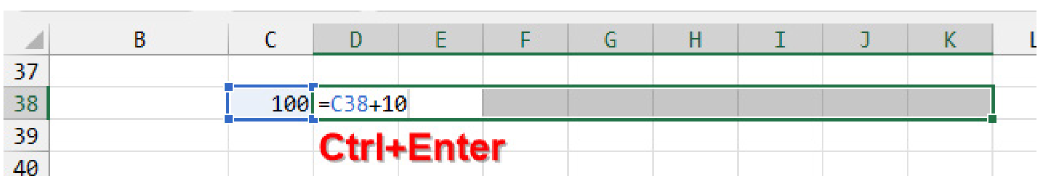



*Figure 11*

In my experience, the active cell of D10 will always be correct after this sequence. In Figure 12, it's easy to see that the values in E38:K38 are also correct. But they're marked as stale values. Microsoft says that depending on the complexity of the worksheet, the values in E38:K38 may not always be correctly calculated at this point. To be overly cautious, Excel will mark these values as stale even though they happen to be correct in this case.

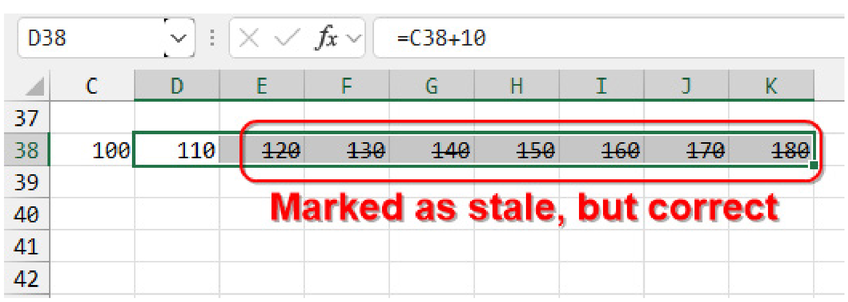



*Figure 12*

## Excel Options and Calculation Mode

The calculation options from Figure 1 are also available in Excel Options, as shown in Figure 13. Note the "Partial" at the top and "Cells containing stale values" near the bottom.

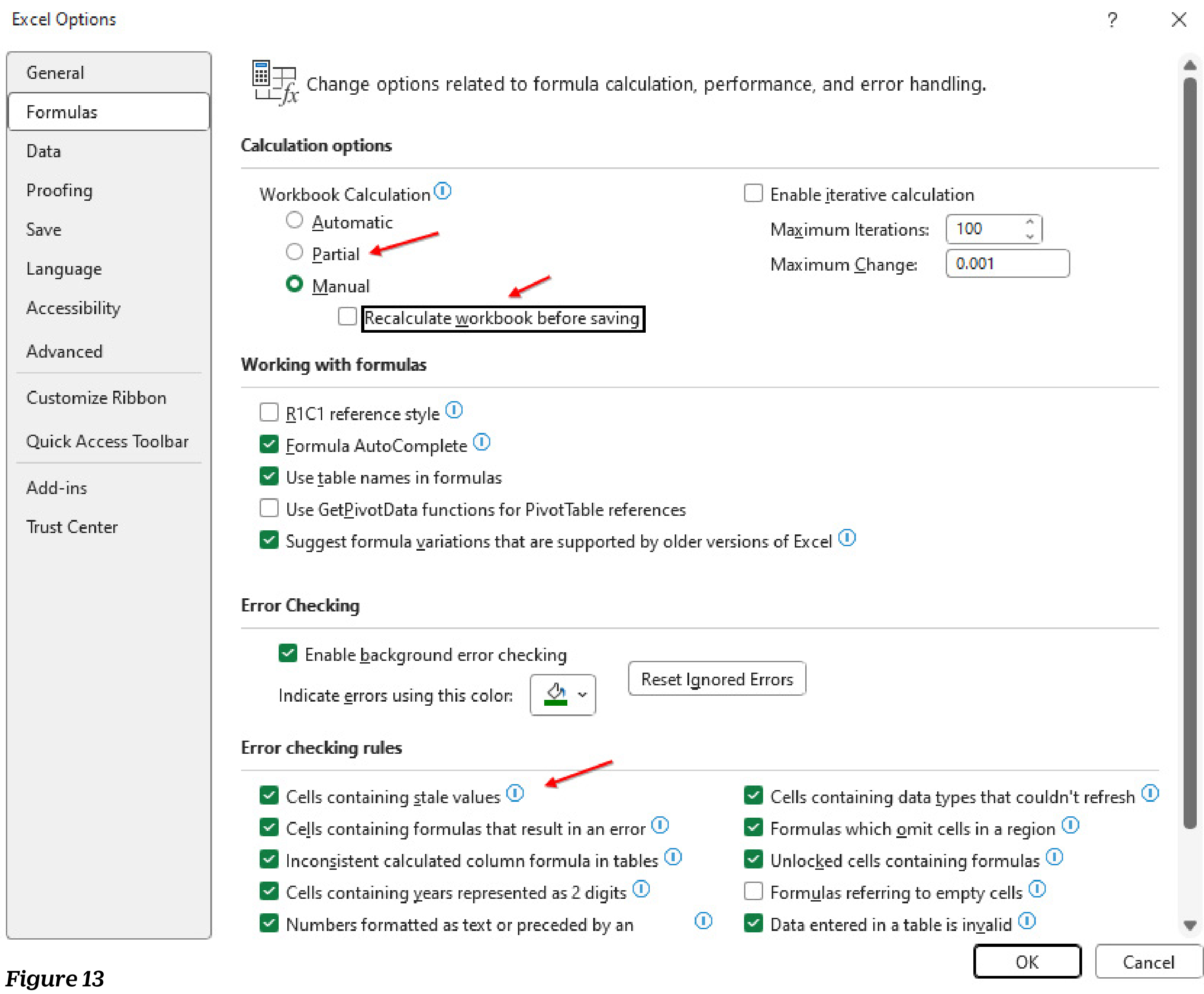



***Figure 13***

Also in Figure 13, there's an option to prevent the workbook from being recalculated before saving. This option is important for people who have workbooks that take hours to calculate.

The new stale value formatting provides an extra visual indicator that the entire workbook hasn't been calculated.

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# Cross-Border Bitcoin

Recent developments in digital payment technology create new possibilities for cross-border, digital payment transactions.

**By Mann Matharu and Monomita Nandy, Ph.D.**

Over time, changes in consumer behavior have driven changes in the payment ecosystem. Vendors and merchants work continually to align their needs with those of the consumer. In one subcategory of this ecosystem, cross-border digital payments, there's currently a focus on reliability, speed, and efficiency. Technology developers seeking to streamline the cross-border digital payment process are facing challenges including, but not limited to, exchange-rate volatility, noncompetitive international payment fees, long delays in payment approval, and lack of trust in the digital payment ecosystem. To overcome such challenges, these technology developers are busy developing a single-connection digital framework that will capture some of the features of embedded finance and open banking. It's worthwhile to evaluate the opportunities and challenges relative to implementing this technology with cross-border digital payments.

Since 2022, there's been an increasing demand for swift, cost-effective, and trustworthy cross-border payments. In response to this demand, several financial institutions started supplying cryptocurrency-based, borderless digital payment in the payment ecosystem. In order to develop an agile system based on cryptocurrency, developers needed to focus on solutions that would drive more knowledge about the reliability of the underlying technology, higher transparency, and higher trust.

## BLN Technology Overview

Bitcoin Lightning Network (BLN) is a second-layer solution built on top of the bitcoin blockchain for the establishment of decentralized and potentially centralized, cross-border payments and other money movement services. It was conceived as a response to the scalability and transaction cost issues faced by the original bitcoin network. While bitcoin's underlying blockchain provides a secure and immutable ledger, its ability to process transactions at scale while keeping fees reasonable has been a point of contention. The BLN is positioned atop the bitcoin blockchain to address these concerns.

At its core, the BLN functions as a system of payment channels, enabling participants to engage in rapid, low-cost transactions without needing to record every single transaction on the main blockchain. This approach reduces congestion on the primary blockchain, resulting in faster transactions and lower fees. By harnessing the BLN, scalability, low fees, and instant settlement capabilities, traditional financial and payment institutions can leverage the power of bitcoin while maintaining their centralized operations, such as governance, consumer protection, and other regulatory obligations.

## Technology Opportunities

The integration of this technology into a centralized banking network has significant potential to impact the way financial transactions are conducted. The benefits are multifaceted, catering to both the institutions themselves and their clientele.

**Scalability.** The off-chain nature allows banking networks to process a multitude of transactions without clogging the main blockchain. As a result, centralized banks can accommodate a larger customer base without compromising transaction speeds or experiencing network congestion. This improves scalability.

**Instant settlements.** The conventional interbank settlement process can take days to finalize, which, in turn, affects cross-border transactions and liquidity management. With this type of technology, centralized banks can introduce near-instantaneous settlement times. The ability to settle transactions in real time could benefit sectors such as international payments. It could eliminate the need for intermediaries and reduce the risk associated with processing delays.

**Low fees.** International transaction fees in traditional banking systems can be substantial. In a recent report, Cointelegraph stated that transaction fees on the BLN technology are 1,000 times cheaper than that of Visa and Mastercard. These two aren't banks, but they're the world's largest payment processors. This technology could enable centralized banks and payment processors to provide more economical transaction fees, optimize operating costs, and potentially attract more clients.

**Enhanced privacy.** Privacy is a significant concern in the financial sector, and the design of this technology aligns well with the need for confidentiality. While the bitcoin blockchain offers transparency and immutability, it also broadcasts transaction details publicly. Conversely, the BLN conducts transactions privately between participants, shielding sensitive financial information from the public eye and preserving traditional banking norms of confidentiality.

**Seamless cross-border transactions.** Cross-border transactions are notorious for their complexities, often involving multiple intermediaries and days of processing time. With technology like BLN, centralized banks could establish interconnected channels to enable instantaneous cross-border transfers. Such a system helps to mitigate some of the uncertainty associated with international transactions.

**Financial inclusion**. A significant proportion of the global population remains unbanked or underbanked due to limited access to traditional financial services. This technology has high accessibility and low entry barriers, which can help to promote financial inclusion. Centralized banks could leverage this technology to offer basic banking and payment services to populations that previously lacked access, thereby contributing to broader financial stability and economic growth.

**Innovation and adaptability.** Integrating with this technology introduces a layer of innovation to centralized banking systems. It encourages financial institutions to rethink their operational models, customer engagement strategies, and product offerings. This innovation could extend to the development of new financial products and services that capitalize on the new capabilities, further enhancing the competitive edge of centralized banks in the Digital Age.

## Current Challenges

While the integration of this technology into centralized banking networks offers remarkable advantages, it also presents certain challenges that need careful consideration. Challenges include, but are not limited to, regulatory oversight, fraud prevention, education, research and development, and user experience.

While bitcoin and other cryptocurrencies have been available for trading via blockchain for several years now, governments and banks are slow to embrace bitcoin and other crypto because they're still relatively unknown. For many banks and financial institutions, the volatility of cryptocurrencies such as bitcoin can prove slightly unnerving. But the emergence of the BLN could help traditional banks and operators start using blockchain for the better. With new developments in digital payment technology, such as BLN, there's reason for hope relative to the future of cross-border, digital payment transactions.

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# Double Gold Triumph

Seeing his students' success inspired this professor to pursue his CMA and CSCA—and win a gold medal for both.

**By Prasart Jongjaroenkamol, Ph.D., CMA, CSCA**

As an assistant professor of accounting and the co-director of the Master of Professional Accounting program at Singapore Management University (SMU), my passion for providing students with a top-notch education and preparing them for careers in the accounting and finance profession has always been my driving force. This commitment recently led me on a transformative journey to pursue both the CMA® (Certified Management Accountant) and CSCA® (Certified in Strategy and Competitive Analysis) certifications.

The catalyst for my pursuit was witnessing the positive impact and value of the CMA Scholarship on my students, thanks to my role as the IMA campus advocate at SMU. Inspired, I decided to lead by example and obtain the CMA certification, enriching my knowledge and gaining practical insights to share with my students.

Upon achieving my CMA, I became aware of the valuable CSCA certification also offered by IMA. The content of the exam perfectly aligned with my teaching objectives, making it an obvious choice for me to pursue. The knowledge I acquired through the CSCA proved invaluable, particularly in understanding business strategies, which is a crucial aspect for financial planning and analysis as well as business valuation. This knowledge empowers me to guide my students in comprehending how the business landscape influences financial decision-making processes.

Both the CMA and CSCA certifications have been pivotal in my professional growth. They equipped me with specific skills and knowledge that have enhanced my role as an educator, ensuring the content I deliver remains relevant and up to date with industry practices. Moreover, they embody my commitment to lifelong learning and serve as a constant reminder to my students of the importance of continuous professional development in our ever-changing field.

As the winner of two gold awards for achieving the highest score on the CMA exam in September 2022 and the CSCA exam in March 2023, I strive to support and inspire others within the accounting and finance community, especially my students. I lead by example, showcasing the value and benefit of professional certifications.

To those currently preparing for these exams, I advise embracing the challenge and recognizing the immense value of the knowledge gained throughout the process. Stay consistent and maintain a steady pace, knowing that your efforts will be rewarded in the end. I acknowledge that managing time between exam preparations and other commitments can be demanding, but with a well-defined plan outlining weekly objectives and dedicated study hours, everything becomes more manageable.

During my CMA exam preparation, I relied on comprehensive practice questions to reinforce my knowledge effectively. To excel in the CSCA exam, I enrolled in the IMA Strategy and Competitive Analysis Learning Series®, which equipped me with the necessary skills and insights.

To my fellow academic professors considering these certifications, I strongly encourage you to seize the opportunity to become students once again. These certifications offer firsthand insight into the challenges and dedication required for effective learning, and they keep us abreast of industry trends, enriching our teaching and research.

Looking back on my journey, I'm grateful for the opportunities provided by the CMA and CSCA certifications. They have not only enriched my teaching but also empowered me to contribute more effectively to the accounting and finance community. These certifications are a testament to my dedication and passion for my profession, and I'm thrilled to inspire others to follow a similar path of professional growth and success.

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