



Potential Ethics Impact on the Behavior of Professional Accountants: Competence and Due Care

Introduction

This publication forms part of the [IESBA's Technology Working Group's Phase 2 Report](#), which documents the impacts of disruptive and transformative technologies on the work of professional accountants, and provides extensive analysis and insights into the ethics dimension of those developments.

Specifically, this publication explores the implications of innovative technologies such as artificial intelligence, blockchain, and cloud computing, as well as related issues such as data governance including cybersecurity, through an ethics lens with a focus on matters in relation to Competence and Due Care, and provides insights into those issues and the questions they raise..

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The full [Phase 2 Report](#) also discusses the relevance and importance of the overarching principles and specific provisions in the [International Code of Ethics for Professional Accountants \(including International Independence Standards\)](#) (the Code) in laying out the ethics guardrails for professional accountants as they face opportunities and challenges in their work as a result of rapid digitalization.

This publication does not amend or override the Code, the text of which alone is authoritative and reading it is not a substitute for reading the Code and is not intended to be exhaustive and reference to the Code itself should always be made. This publication does not constitute an authoritative or official pronouncement of the IESBA.

Potential Ethics Impact on the Behavior of PAs

The following sections of the report focus on the potential ethics impacts of technology on the behavior of PAs: competence and due care, objectivity, transparency and confidentiality, and independence. The Working Group acknowledges that many of the impacts raised by stakeholders during Phase 2 of fact-finding both reaffirm and underscore the outcomes from [Phase 1](#), thereby supporting the IESBA's [Technology ED](#). Other foreseeable impacts or concerns raised by stakeholders are new or extend the Phase 1 findings. These further impacts or concerns form the basis of the Working Group's insights and recommendations, detailed in [Section III: Insights and Recommendations](#), with respect to areas of potential enhancement to the Code and topics for non-authoritative guidance for the IESBA's consideration.¹

Competence and Due Care

Need for Competence in the Digital Age

1. The business world today is dynamic, complex,² and broad, with many grey areas. The vast amount of data that is available far exceeds the human mind's ability to process and understand it.³ There continue to be significant changes and developments in technological innovation, as well as in standards and regulations. Against this backdrop, the Working Group notes that the competence of PAs needs to adapt to meet the profession's responsibility to act in the public interest and to rise to opportunities. This competence gap is not limited to PAs, of course, but rather is also relevant for all actors in the business and finance ecosystem, including regulators.
2. Stakeholders stressed that PAs have a great deal to keep up with and there is a growing need to use technology to manage complexity and leverage opportunities arising from emerging technology and the availability of data. In particular, it is also noted that SMPs (who make up a large proportion of PAPPs), and particularly sole practitioners, have significant time and resource constraints, which makes "keeping up" more challenging and potentially creates a bigger competency gap risk. However, PAs might still be drawn to the allure of leveraging the opportunities and efficiencies of technology despite lacking the requisite competence.
3. Stakeholders further reported that investment in, and accessibility of, online training has exponentially exploded across organizations. However, they also indicated that training junior staff (i.e., candidates to the accountancy profession) to apply professional judgment is becoming more challenging as automation and AI take over more tasks and processes that junior staff were once completing as part of their qualifying period of practical experience. This potentially creates a gap in understanding the "basics" and being ready to effectively oversee the work of autonomous and intelligent agents. It was suggested that the application of VR and other immersive platforms might assist in mitigating these sorts of issues by providing or supplementing such experience through simulations.
4. On a related note, concerns were also raised by stakeholders that junior staff might be considered more technology-literate than they really are, resulting in an over-reliance on such staff when using certain technologies. Despite junior staff growing up in an environment where "technology is everywhere," they often do not have specific experience with some of the key transformational technologies being developed and implemented by organizations (e.g., machine learning, blockchain, and data analytics tools).
5. Specific to PAs, stakeholders viewed traditional accountancy skills as core "table stakes," whereas more breadth in both technology upskilling and enhancing professional skills is seen as being a priority.⁴ Stakeholders also noted that it is important for PAs to recognize that developing, implementing or using technology is not just an IT department issue – PAs need to have sufficient competence to enhance their opportunity to be part of the decision-making process and address potential issues arising from technology. For example, managing financial and related systems, business processes, policies, and controls is traditionally the domain of PAs (and not IT professionals). PAs, however, need to have sufficient competence in emerging and transformative technology and data literacy to adapt these traditional skills to the new context. Therefore, the application of professional skills as necessary for managing multidisciplinary teams that consist of IT and other professionals, and cross training between IT and accounting, is increasingly critical and of significant benefit and value for organizations and firms.
6. There is general acknowledgement from stakeholders that whereas PAs do not need to be the "experts" in technology, they



nevertheless need sufficient competence in the area. Naturally, this raises questions about what is considered “sufficient” competence and how this changes depending on the PA’s position and role within the organization. This is particularly important as typically senior-level PAIBs⁵ are responsible for signing off on IT controls over financial systems. These PAs must therefore understand the risks and processes, and what should be done to mitigate those risks. In addition, a few stakeholders wondered whether there should be guidelines on sufficient professional competence for PAPPs in relation to technologies implemented by their clients, as this would better help firms determine whether to accept or decline professional engagements on this basis and where to allocate training resources.

7. Stakeholders generally describe “sufficient” competence as knowing enough about how the technology works in order to:
 - (a) Ask IT professionals appropriate questions and *understand* their responses in the context of the system or tools being assessed;
 - (b) Have *confidence* in what is happening with the system or tool; and
 - (c) Be able to *justify* the use and outputs of the tool.

In this regard, the subsection below on [Technology Upskilling Needed](#) describes in detail what stakeholders believe this entails in a practical sense. However, stakeholders acknowledged that it is impractical to define specific thresholds for “sufficient” competence for technology overall, given its broad and dynamic nature, varied applicability, the range of PA roles interacting with different technologies, and the need for contextual professional judgment. It was also observed that because of the complex business environment, the focus has shifted from achieving a certain depth of knowledge at a point in time, to continuously keeping up with what is going on in a broader context – what some stakeholders referred to as “life-long learning.”

8. As a result, initial and continuing professional development (IPD and CPD) must continue to evolve to ensure, among other matters, that the necessary technologies (i.e., basic computing, data analytics, AI, blockchain, and other related concepts/skills, such as the difference between structured and unstructured data) are integrated into training and professional development programs. Already, significant changes are being made to numerous accounting curricula at universities and through PAOs and in CPD programs.⁶



Technology Upskilling Needed

9. The Working Group observes that deeper technology-related skills will enable PAs to leverage the tremendous opportunities and benefits offered by technology, as well as to enhance the opportunity for PAs to be at the technology decision-making table and help serve as ethical stewards by asking the right questions, explaining the potential ethics implications of decisions, and assisting in choosing appropriate technology solutions. However, as also noted in the discussions on [Ethical Leadership](#) and [Need for Competence in the Digital Age](#), stakeholders repeatedly emphasized the broad perception that there might not be enough trust in PAs to be at the table because PAs are not seen to have mastered the “language” and fundamentals of innovative and disruptive technologies. For example, stakeholders observed that:
 - PAs often lack relevant practical experience and knowledge about AI, blockchain (including cryptocurrencies⁷), and data governance to know what type of questions to ask, how to identify specific risks and errors and the related mitigation remedy, and how to assess the reliability of these transformational technologies. There is a further concern around the

consequences of PAs being the end users of such technology and relying on the outputs relative to a lack of sufficient competence.

- PAs tend to have insufficient knowledge about cybersecurity, which is key to safeguarding the data under their charge and upon which they rely to support decision-making. In fact, it was suggested that most individuals, including PAs, do not know how to protect themselves and their own devices from cyberattacks.

10. Stakeholders outlined five key areas of technology upskilling they believe are necessary as digital transformation changes the profession. This upskilling will permit PAs to not only uphold their professional obligations of professional competence and due care, but also earn their place at the decision-making table to advise strategically and knowledgeably on the risks and benefits of technology development, implementation, and use in organizations and firms. Unsurprisingly, due to the volume of, and reliance on, data, the most cited area of upskilling is data-related skills and concepts. For example, PAs need to be able to determine that data used for data analytics, RPA, or AI is high quality and fit-for-purpose (see discussion on [Focus on Data Governance](#)).

11. Stakeholders also provided specific examples of skills they believe are important in each of these five key areas. These examples largely relate again to the key upskilling area of data-related skills and concepts:

Upskilling Area	Specific Examples Highlighted by Stakeholders as Important
Data-related skills and concepts	<ul style="list-style-type: none"> • How to classify data (critical vs non-critical) • What is confidential and “how” confidential • Determining the quality of data • Consequences (intended and unintended) of data collection, use, storage and destruction across the stages in the data value chain • Data analytics (incl. for forecasting and strategy) • Data visualization • Auditing data sets • Ensuring data completeness
Technology Capability	<ul style="list-style-type: none"> • Effectiveness of control environment • Identification of risks • How technology is used to manipulate results (fraud)
Cybersecurity	<ul style="list-style-type: none"> • Cyber-attack techniques • Cyber-regulations • Maintaining privacy, incl. potential liability if privacy regulations are breached
Foundational IT	<ul style="list-style-type: none"> • Source code understanding • Basic level of programming
AI	<ul style="list-style-type: none"> • Assessment of intelligent agents

12. Stakeholders noted that PAs should be encouraged to recognize the relevance of technology to the performance of their professional activities and develop the appropriate competence to use technology. In addition, a few stakeholders suggested that more technology-savvy PAs could also perform third-party certifications to ensure that technology is operating as intended. This is seen as a good fit because PAs can apply their traditional skillset of identifying the risks and controls pertaining to business processes to a technology implementation context, coupled with the application of ethics.
13. Finally, stakeholders observed that firms and organizations have moved to hiring individuals into their accounting or audit teams with wider or different, but complementary skillsets than a traditional accounting and auditing background. Commonly sought-after skills include transformational technologies, data governance and analytics, and cybersecurity.⁸ This largely matches the areas of proposed upskilling, further underscoring the demand for competence in these areas and the perceived gap in the existing PA space. Note that although IPD can be changed relatively quickly in many jurisdictions and institutions (perhaps 12-24 months), upskilling existing PAs through CPD is normally much more challenging and time consuming (even if introducing the courses themselves might be faster than through IPD).

Application of Core Accounting-related Skills Integrated with Professional Skills, Values, Ethics, and Attitudes

14. Stakeholders view that many of a PAs current core accounting skills are particularly valuable and transferable when applied appropriately in the context of emerging and transformative technology. For example, PAs have significant business intelligence and regularly establish business cases, optimize business processes, and establish control frameworks. These are important aspects to apply in activities such as considering a potential investment in new technology, identifying relevant risks, and implementing and documenting effective processes and controls. In particular, stakeholders commented that PAs, such as CFOs and their finance and accounting, planning, and analysis teams, traditionally play a central role in times of business or financial crisis to help organizations navigate and mitigate shock and disruption to the business eco-system. PAs are considered well positioned to deal with such complexities due to their professional training and broad problem-solving skillsets.⁹

15. Complex circumstances¹⁰ are exacerbated in today's digital age by the ongoing rapid confluence of advancing technologies; increasing data creation, availability, and its interconnectedness; and emerging laws, regulations, and public expectations around novel approaches to transactions, finance, business models, tax planning, and sustainability. PAs need to recognize the significant digital transformation that is happening and understand its broader implications to compliance with the Code's fundamental principles and approaches to the professional activities they perform. PAs also need to complement their existing skillsets and behavior with the relevant upskilling and competence required for the profession to remain relevant.

16. Specifically, stakeholders emphasized that having the right mindset and applying professional skills, values, ethics, and attitudes¹¹ are essential for PAs to continue to serve as trusted advisors. This, in particular, continues to differentiate humans and machines and echoes the theme documented as part of the Working Group's thought leadership work.¹² In addition, the Working Group notes that although some PAs shy away from embracing the use of technology, it is critical that PAs leverage technology so that it complements, supplements, and elevates human judgment, rather than trying to replace it.

17. For example, some stakeholders observed that companies sometimes make decisions purely based on data, neglecting the



value of human input in terms of professional judgment considering the facts and circumstances at hand. Significant negative consequences can be expected where humans are not kept in the loop (i.e., human involvement) of automated processes or decision-making, for example, to perform reasonableness checks and to bring an element of alertness for issues with data integrity and bias.¹³

18. The important non-technical skills that stakeholders highlighted as differentiators between PAs and autonomous and intelligent systems include:

(a) Professional skills: PAs should be encouraged to think broader than their functional role, adopt enterprise-wide thinking, and be more well-rounded. Applying professional skills helps to facilitate effective oversight of teams (including the use of technology), strategy creation, and decision-making, as more routine and mechanical tasks are being automated. Professional skills include:

- Communication skills to build strong and collaborative teams.
- Entrepreneurial skills that support innovation, creativity, disruption, and thinking outside of the box.
- Emotional intelligence, such as negotiation, influencing, persuading, and conflict management.

All PAs are expected to have technical skills. As mentioned in the discussion on [Need for Competence in the Digital Age](#), such skills are now being deemed as table stakes. However, professional skills are becoming regarded as important, if not more so, in some situations.¹⁴

(b) Professional judgment and an inquiring mind: Part of a PA's value proposition is their training and experience to exercise professional judgment and be inquisitive, i.e., have an inquiring mind. Whereas there is a risk that machines will overtake human decision-making in the future, PAs are still well positioned to exercise their core skills of professional or business judgment. At the same time, PAs can resist undue influence from, or overreliance on, technology. They can also remain aware of and mitigate the effect of bias.

Stakeholders noted that these core judgment skills are particularly critical when procuring and using or relying on AI. For example, PAs in charge of such functions can behave ethically by exercising professional judgment and having an inquiring mind to ask questions to ensure that the AI under consideration is fit for purpose, that the data inputs are fair and "free" from bias (i.e., that at least the bias is acknowledged and accounted for when evaluating the outputs), and that the information or output generated by the AI system makes sense.

(c) Mindset and attitude: The complexity of today's digital world – where, among other factors, technology, laws and regulations, and socially responsible and acceptable good practices and public expectations are constantly evolving – means that having the right mindset and attitude is important to stay current. Stakeholders described the right mindset in this context as proactively seeking out new learning opportunities, which some referred to as a "growth mindset," to promote life-long learning. In addition, because the world is not typically a binary delineation between "right" and "wrong," but rather is increasingly about managing uncertainty and complexity, having the right attitude, such as being accountable for one's own actions as part of a larger team, is key. This is seen as being well aligned with a PA's acceptance of their professional responsibility to act in the public interest.

Need for Diligence/Due Care

19. As documented in the Working Group's thought leadership work,¹⁵ diligence and due care are needed to enable competent decision-making and service to clients and employers around transformational technology. Such transformational technology often present circumstances with increased complexity, dynamism and automation bias, increasingly sophisticated mis- and disinformation, and security threats (internal and external). However, it is important to recognize practical limitations, including being intimidated or overwhelmed by technology and the pace of technological and regulatory change. PAs must

also recognize that one cannot have access to all relevant information in real-time when decisions need to be made, and that the information available might well be the best that exists at that time. The consequences of decisions should, therefore, be monitored, and actions adapted, as additional data or information becomes available. This is the essence of managing complex circumstances.

20. In particular, stakeholders stressed that higher levels of due care are needed to ensure that:

- Technology used is fit-for-purpose. It is observed that it will become incumbent on technology providers to prove that the technology is doing what it is supposed to; make AI systems interpretable so that PAs and others are able to understand the system's decision-making process and be able to assess the reasonableness of its outputs; and ensure appropriate data governance practices are applied to enhance trust. These are seen as key areas where PAs should challenge technology providers.¹⁶
- Data created, collected, or acquired and used is secure and handled appropriately. The stewardship and security of data are important. PAs must recognize the need for cyber-vigilance in light of threats to help ensure breaches do not occur with respect to the data flowing through their systems and processes. See discussion on [Focus on Data Governance](#).



Endnotes

- ¹ In considering the Working Group's recommendations detailed in Section III of this report, the IESBA will, when prioritizing future projects and initiatives, also take into account and balance other considerations such as responses from the 2022 Strategy Survey, findings from its recently completed benchmarking initiative, its pre-commitments, and resources available.
- ² "Complexity and the professional accountant: Practical guidance for ethical decision-making." *CPA Canada, ICAS, IFAC and IESBA*, June 2021, <https://www.cpacanada.ca/en/foresight-initiative/trust-and-ethics/complexity-guidance-ethical-decision-making>.
- ³ Maughan, Tim. "The Modern World Has Finally Become Too Complex for Any of Us to Understand." *OneZero*, 30 November 2020, <https://onezero.medium.com/the-modern-world-has-finally-become-too-complex-for-any-of-us-to-understand-1a0b46fbc292>.
- ⁴ See, for example, "Mindset and enabling skills of professional accountants – a competence paradigm shift." *CPA Canada, ICAS, IFAC and IESBA*, April 2022, <https://www.cpacanada.ca/en/foresight-initiative/trust-and-ethics/mindsets-professional-accountants>.
- ⁵ In some instances, stakeholders reported observing that organizations are folding the role of Chief Information Officer/Chief Technology Officer (CIO/CTO) with that of the Chief Financial Officer (CFO) role given that enterprise resource planning systems used for accounting and finance are "overseen" by internal control processes and might be the largest IT package that a company maintains.
- ⁶ For example, CA ANZ's qualification program now includes some technology and ethics-related modules, including Ethics and Business, Risk and Technology, Data Analytics and Insights: "CPA Program Overview." *CA ANZ*, <https://www.charteredaccountantsanz.com/become-a-member/apply-for-the-ca-program/ca-program-overview>; CPA Evolution Model Curriculum developed by NASBA and AICPA to assist faculty who want to prepare their students for the CPA profession, and which has considered the need for newly licensed CPAs to have deeper skill sets, more competencies and greater knowledge of emerging technologies: "CPA Evolution Model Curriculum." *NASBA*, https://nasba.org/wp-content/uploads/2021/06/Model-curriculum_web_6.11.21.pdf; CPA Canada's Competency Map 2.0, which significantly reimagines the skills and competencies required by future accountants in the context of emerging opportunities, the influence of automation, and increased interconnectedness: "Competency Map 2.0: Learn today. Lead tomorrow." *CPA Canada*, <https://www.cpacanada.ca/en/become-a-cpa/why-become-a-cpa/the-cpa-certification-program/the-cpa-competency-map/competency-map-2-0>.
- ⁷ See, for example, Sharma, Sonia. "Advisers must deepen understanding of cryptoassets as client demand increases, industry figures say." *AccountancyAge*, 10 August 2022, <https://www.accountancyage.com/2022/08/10/advisers-must-deepen-understanding-of-cryptoassets-as-client-demand-increases-industry-figures-say/> and Choo, Lindsey. "You might be evading crypto taxes and not even know it." *Protocol*, 10 April 2022, <https://www.protocol.com/fintech/crypto-taxes-staking-mining-airdrops>.
- ⁸ Note, for example, that some post-secondary institutions are seeking to fill such perceived skill gaps through the development of new graduate-level programs, such as York University's Master of Financial Accountability. This program promotes the acquisition of "strong critical knowledge and practical skills from across the areas of accountability, assurance, climate change, compensation, cyber security, ethics, governance, law and risk management" and does not lead to professional accounting credential – see "Discover the Master of Financial Accountability (MFAc) Program at York University." *York University*, <https://mfac.gradstudies.yorku.ca/about/>. These are important matters to consider as PAOs evolve their competency frameworks for IPD and CPD.
- ⁹ For examples of how AI and big data analysis can augment the work of PAs in addressing complex issues, such as supply chain disruptions in times of crisis, see Heaven, Will Douglas. "How AI digital twins help weather the world's supply chain nightmare." *MIT Technology Review*, 26 October 2021, <https://www.technologyreview.com/2021/10/26/1038643/ai-reinforcement-learning-digital-twins-can-solve-supply-chain-shortages-and-save-christmas/>.
- ¹⁰ [Supra note 133](#)
- ¹¹ See for example, "International Education Standard 3: Professional Skills." *IFAC*, <https://education.ifac.org/part/ies-3>; and "International Education Standard 4: Professional Values, Ethics and Attitudes." *IFAC*, <https://education.ifac.org/part/ies-4>.
- ¹² [Supra note 136](#)
- ¹³ There are also potential risks of over-reliance and bias created by introducing human oversight that should be considered when designing systems. See, for example, Green, Ben, and Amba Kak. "The False Comfort of Human Oversight as an Antidote to AI Harm." *Slate*, 15 June 2021, <https://slate.com/technology/2021/06/human-oversight-artificial-intelligence-laws.html>.
- ¹⁴ See, for example, Chabus, Ryan. "Top soft skills for accounting Professionals." *AICPA Journal of Accountancy*, 7 June 2021, <https://www.journalofaccountancy.com/newsletters/2021/jun/top-soft-skills-accounting-professionals.html>, which reports that in a recent survey by the Society for Human Resource Management, 97% of employers stated that soft skills were either as important or more important than hard skills.
- ¹⁵ [Supra note 133](#)
- ¹⁶ For some ideas on what PAs might consider when choosing a technology to adopt, and what questions to ask of technology providers, see, for example, Silvergate, Paul H, et al. "Beyond good intentions." *Deloitte*, 27 October 2021, <https://www2.deloitte.com/us/en/insights/industry/technology/ethical-dilemmas-in-technology.html> and Hall, Patrick, and Ayoub Ouederni. "Seven Legal Questions for Data Scientists." *O'Reilly*, 19 January 2021, <https://www.oreilly.com/radar/seven-legal-questions-for-data-scientists/>.

ABOUT THE IESBA

The International Ethics Standards Board for Accountants (IESBA) is an independent global standard-setting board. The IESBA serves the public interest by setting ethics standards, including auditor independence requirements, which seek to raise the bar for ethical conduct and practice for all professional accountants through a robust, globally operable *International Code of Ethics for Professional Accountants (including International Independence Standards)*.

The IESBA believes a single set of high-quality ethics standards enhances the quality and consistency of services provided by professional accountants, thus contributing to public trust and confidence in the accountancy profession. The IESBA sets its standards in the public interest with advice from the IESBA Consultative Advisory Group (CAG) and under the oversight of the Public Interest Oversight Board (PIOB).

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