



Bridging the Gap between the Theory of Ethical Principles and the Practice of Technology Ethics in Organizations: The ITEC Primer

José Roger Flahaux, Brian Patrick Green, Ann Gregg Skeet



This is a condensed excerpt from “Ethics in the Age of Disruptive Technologies: An Operational Roadmap,” produced by the Institute for Technology, Ethics, and Culture (ITEC.) ITEC is an initiative of the Markkula Center for Applied Ethics at Santa Clara University, with the support from and collaboration with the Vatican’s Centre for Digital Culture at the Dicastery for Culture and Education. The Institute convenes leaders from business, civil society, academia, government, and all faith and belief traditions, to promote deeper thought on technology’s impact on humanity. We also have additional resources about the [principles](#)¹ used in this book and an [overview of the stages](#)² of the operational roadmap.

The World We Live In

Advanced technologies such as artificial intelligence (AI), machine learning, autonomous and intelligent systems, encryption, tracking, and facial recognition are increasingly at the center of political and social debates that are often reinforced by current geopolitical developments.

The public, scholars, civil society, governments, and policy makers, are increasingly aware and concerned about data processing technologies and algorithms that businesses are developing in a relatively lightly and inconsistently regulated environment. Some digital surveillance techniques (facial and voice recognition, for example) are rapidly being created and deployed with little external oversight, creating significant societal risks. Around the globe, lawmakers and regulators are rushing to fill this perceived gap, calling for appropriate guardrails to protect against technology development at breakneck speed. If industry leaders do not quickly adopt an actionable

¹ ITEC, “ITEC Principles and How to Use Them: Anchoring, Guiding, Specifying, and Action,” *Markkula Center website*, June 2023, available at: <https://www.scu.edu/institute-for-technology-ethics-and-culture/itec-principles/>

² ITEC, “The ITEC Handbook: An Overview of the Five Stages of the ITEC Roadmap,” *Markkula Center website*, June 2023, available at <https://www.scu.edu/institute-for-technology-ethics-and-culture/itec-stages-overview/>

and reliable ethical framework with demonstrable effectiveness, they will quickly find themselves trapped in a quagmire of inconsistent and even contradictory laws and regulations.

Today's Challenge

Business leaders in the new world of AI and advanced technologies are faced with the challenge of how to manage the business within the stockholder primacy model while achieving the broader concepts of ethical behavior as viewed by internal and external stakeholders.

Various government and civil society organizations have published recommended ethical principles and frameworks to provide guidance to organizations developing or adopting advanced technologies. These documents provide valuable insights on “what” to consider but often fall short on “how” to do it.

Executives are looking for practical help to translate their own moral compass and business commitment to ethical principles. These principles must then be operationalized—put into practice at all levels of the enterprise and throughout the entire life cycle of the products and services it offers, connecting the enterprise and stakeholders for social, technical, and business alignment by balancing responsible use and technology innovation.

Technology challenges us with new things to see, ethically speaking, every day, and when these things first appear they may go unrecognized, or seen, but only dimly so, or seen and ignored, and so on. But eventually, somebody will see the problem and it will need to be solved. That requires having clarity of vision, using the right lenses or tools for seeing and thinking about these problems. We need a new pair of responsible technology glasses.

Technology is now ubiquitous, and companies who fall behind in technology will increasingly fall behind. As just one example, among other advanced technologies, artificial intelligence (AI) offers the opportunity to create new and transformative data-driven business models. But it is not just for big software companies anymore; it is becoming an increasingly important part of the strategy of other industries as well. AI offers a way to attain business objectives across a multitude of sectors.

Many companies use AI-powered marketing tools fueled by the purchase of widely available commercial datasets of customer movements (such as GPS tracking) and online activities (websites visited) for targeted marketing of products and services.

Advanced technologies also provide ways to automate certain key business processes or tasks, making them more efficient, effective, and less costly. Software bots are now often the first point of contact for customer support, providing automated conversations in most major languages, anywhere and anytime. Very complex tasks, the automation of which some once thought



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unthinkable, can now be automated. For example, visual inspections of complex components are now routinely conducted at very high-speed using machine vision.

Sooner rather than later most companies will rely on AI and other advance technologies to become more competitive.

Anything involving the collection and use of datasets will cause concerns about privacy and security. Algorithms influenced by the enterprise business goals, the culture, and moral compass of the individuals designing them use the datasets to actively make decisions impacting lives. Guardrails must be put in place to ensure that these powerful tools protect the well-being of all stakeholders.

Not just for tech companies

A relatively small number of companies have the capability of developing the most advanced technologies, but most companies will adopt many of these technologies in various ways. Some will buy the output of powerful analytical tools to fuel their marketing and sales activities. Others will integrate them with their enterprise management systems or rely on technology-savvy subcontractors to develop new services and products. Whether or not the use of advanced technology tools is obvious or hidden, it is increasingly likely that the services and products an organization offers will be handled by processes that rely on such technologies somewhere during their life cycle, from concept through design, development, production, sales, use, and support.

Throughout this life cycle, organizations should make sure that they are complying with regulations, ensuring ethical risks are mitigated to prevent individual harmful consequences and resulting legal actions, as well as working to safeguard the company's reputation.

The bottom line is that customers want products and services developed ethically because, ultimately, they will live in a world pervaded by these products and services. Furthermore, we all have to live in this world that we are creating together. If we build the future badly, we will live in a terrible world.

Even mere self-interest should be sufficient motivation. There are many examples of companies benefitting from making ethically good choices and being harmed by making ethically bad choices. But, if we have any empathy or care for other people or the natural environment then we should care even more. We – particularly leaders – have tremendous power.



Good intentions are not enough

Good intentions are great, and most people have good intentions, including business leaders. There are very few people who want to actively harm the world. And yet, despite the fact that almost everyone has good intentions, the ethical missteps in developing and using technology happen regularly; clearly there is some disconnect that requires work. This disconnect between good intentions and good outcomes can only be solved through careful operationalization: turning thoughts and intentions into reality, or, in other words, ethical principles into practice. Perhaps it helps to consider why, even with the best intentions, systems developed after a lot of planning and using considerable resources can still fail. Here are five basic reasons:

- 1. Failure to account for all stakeholders.** The first failure mode is that current approaches to thinking about organizational systems limit their analysis in ways that exclude stakeholders. The IEEE 7000-2021 standard defines a stakeholder as anyone or any organization that is
 - a) Meaningfully or potentially meaningfully impacted by, and/or
 - b) Meaningfully or potentially meaningfully impacts the product/service.²
- 2. Lack of Commitment.** Even if the organization has employees who care about direct and indirect stakeholders and the responsible development of technology, there still might not be enough of them – a critical mass – particularly in the leadership, to actually lead the company towards ethical outcomes.
- 3. Lack of skills, knowledge and/or resources.** Even if leaders are on board, they may still lack adequate skills, knowledge, experience, and resources to achieve their ethical goals. In this scenario, there is genuine leadership buy-in but lack of understanding of how to achieve the desired end.
- 4. Failure to comprehensively assess risks.** Even when an organization has the knowhow and resources to develop technology responsibly, it may still have blind spots that result from the lack of comprehensive processes. Thus, an organization might overlook certain tools when considering ethical issues, particularly during product design and development when objectives and features are specified.
- 5. Failure to stay the course.** When an organization overcomes the above challenges and implements an effective and comprehensive system, there is always the danger of slipping

² IEEE, “Standard 7000-2021: IEEE Standard Model Process for Addressing Ethical Concerns during System Design,” *IEEE*, 15 September 2021, available at: <https://standards.ieee.org/ieee/7000/6781/>

back into old ways, cutting corners, or otherwise losing the ethical culture that has been fostered over time. This risk is particularly high for businesses facing economic challenges or periods of significant change.

All these above failure modes – and more – are specifically addressed, with solutions, in the book *Ethics in the Age of Disruptive Technologies: An Operational Roadmap*. We refer to this book as the *ITEC Handbook*.

A Positive Framing: How to achieve systemic success

Everything that can be framed negatively, as a failure to avoid, can also be framed positively, in terms of some good sought after. The *ITEC Handbook* often switches between negative and positive framings. This is important to be aware of in general because it is a sort of human default reaction to report the negative, not the positive. News and media are often framed this way. But notice what happens when we take the above five “failure modes” and frame them positively.

1. **Include all stakeholders.** Everyone impacted by a decision or product, direct or indirect, deserves respect and consideration.
2. **Commit 100% to Ethical Culture.** The tone of a culture is set from the top; leadership is crucial for making an organizational culture work well.
3. **Develop Strong Ethical Skills, Knowledge, Processes and Resources.** To be the best, you need to train like the best, gain the knowledge and resources needed, and become truly skilled at ethical judgment.
4. **Comprehensively Assess Risks.** Look for everything that might go wrong and prepare for it, to either prevent it from happening or mitigate any harm if necessary.
5. **Stay the Course & Stick with the Program.** Staying committed to ethical values is work, but it is worth it. Be tenacious when it comes to maintaining an ethical culture. Maintain a growth mindset, constantly adapting to new situations and learning new ways to improve.

By way of example, we share the ITEC theory of change, framed in a positive manner.

Our Theory of Change

To successfully adopt, apply, and demonstrate the effectiveness of ethical development and use principles that benefit the common good of humanity and the environment, organizations must:

- Understand the ethical requirements of their customers and internal and external stakeholders (including governments, policy makers, civil society, academics, and employees).



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- Transform their own enterprise culture to ensure everyone feels ownership for thinking through the consequences of the enterprise's technology and accountability for its impact on humanity and the planet.
- Implement a responsible technology management system, which focuses on meeting customer requirements and stakeholder ethical values throughout the entire life cycle of the products and services offered.

A guide for the journey

There are clearly many steps to developing technologies responsibly. Even with sharper vision, it is all too easy to get lost in the morass of pressing, daily business needs and new product and service development cycles. Not only do the executives making the attempt need better glasses to sharpen their focus, but they also need a roadmap to know where to go next and how to track their progress.

The *ITEC Handbook* fills the gap between theory and practice by offering such a step-by-step roadmap outlining rules, practices, and processes to develop in each of the successive stages of the enterprise technology ethics transformation. It provides a bridge between theoretical ethical principles, management concepts, and detailed guidelines to operationalize them across the entire organization.

The handbook is a customizable practical guide to help organizations transform their mindset and culture, and operationalize ethical and humane use principles to ensure their products and services, throughout their life cycle, focus on stakeholder ethical values, increase human flourishing (including that of future generations), and the promote healthy and sustainable life on this planet, while satisfying customer requirements, complying with applicable regulations, and achieving continual improvement of their ethical performance.

Like most handbooks, ours is a collection of instructions that is intended to provide ready reference and advice about how to do something. To do something right, you first need to know what you want to correct or, even better, prevent from happening. In the case of responsible technology, you must understand the ethical risks that advanced technologies can pose, where they originate from, their potential harmful impact on stakeholders, and the negative consequences for your enterprise.

Our purpose

The goal of this handbook is to give the reader and their organization the clarity of vision necessary to deal with the new problems that are appearing and will continue to appear as emerging technologies begin to affect society. To make this clarity of sight possible, the entire organization needs to be aligned with the goal of attaining clear ethical vision. Some people may have better



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eyesight than others, but if an organization is properly structured that sight can be shared and shape the whole organization for the better.

It guides management in their journey from discernment and translation of leadership's commitment through an understanding of stakeholders' ethical requirements, the development of ethical principles and a purposeful technology ethics governance framework. It also describes how to define, implement, and manage an ethical values-focused Responsible Technology Management System (RTMS), aligning the enterprise and stakeholders for social, technical, and business success for the common good of humanity and the environment.

Using the *ITEC Handbook*

The handbook provides a step-by-step **Operationalization Roadmap** to translate business leadership's commitment to ethical principles into action. This is accomplished through the adoption of a **Technology Ethics Governance Framework** and its implementation into a stakeholder-ethical-value-focused **Responsible Technology Management System (RTMS or "Artemis")**.

Definitions:

- **Operationalization Roadmap** – The plan outlining the successive stages of the enterprise technology ethics transformation journey, and defining the ownership, desired outcome, and key deliverables of each stage.
- **Technology Ethics Governance Framework** – The set of rules, practices, and processes defining the elements of the technology ethics mindset and culture, and the ethically aligned engineering management system the entire enterprise must develop.
- **Responsible Technology Management System (RTMS)** – The Mindset & Culture and Product & Service Life cycle interconnected management subsystems aligning the Enterprise and Stakeholders for social, technical, and business success for the Common Good of Humanity and the Environment.

The handbook has a two-part layout followed by appendices.

Part 1 provides an overview of the responsible technology management system operationalization roadmap. In Part 2, this system is discussed in more detail. In the Appendices, a few subjects are explored more closely, for those who really want to know every grain of the beach.

The handbook is structured this way so that the depth of the material is preserved but not presented all at once, which would be overwhelming. For those who need to understand the entire responsible technology management system in detail, they should read the entire book. For those who need to know it in less detail, a linear reading will give the necessary information and they may stop when



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they have achieved the level they desire. The “Audience Matrix” below serves to guide the reader to the most relevant parts of the handbook.

For each stage of the operationalization roadmap, the handbook provides a high-level list of the topics that should be considered and discussed, and a chart which identifies the key elements associated with each area of focus.

The handbook is to be used as a ready reference document that can be consulted by each category of reader to focus their thoughts, increase overall understanding, and act as a catalyst for action, whenever they need focused guidance.

Audience	Concerns & Priorities	Key Questions	Forewords	Rationale	Executive Summary	Part 1: RTMS Overview	Part 2: Introduction	Part 2 - Stage 1	Part 2 - Stage 2	Part 2 - Stage 3	Part 2 - Stage 4a	Part 2 - Stage 4b	Part 2 - Stage 5	Appendix 1	Appendix 2	Appendix 3	Appendix 4
CEO & C-suite	Growth	Why does this concern our company?															
	Brand trust	What do we need to learn?															
	Technology	What is the holistic solution?	X	X	X	X											
	Workforce retention	How can we fix this?															
General Counsel	Social responsibility	What do we need to report?															
	Obligation to stockholders	How does this sustain shareholder value?															
	Governance obligation	What is the governance framework?															
	Board oversight effectiveness	Are new skills, knowledge and processes required?	X	X	X	X	X	X	X	X			X				
Technology Ethics Champion	Effectiveness of the adopted values	How can effectiveness be demonstrated?															
	Compliance	What are the control and audit processes?															
	Domain expertise	What is the problem?															
	Change management	What are the root causes?	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Human Resources Executives & Managers	Focal point	What do I need to learn?															
	Regulation compliance	What is the holistic solution?															
	ESG reporting	How can I fix this?															
	Attract & retain talent	Why does this concern me?															
Product & Service Life Cycle Executives & Managers	Diversity-Equity-Inclusion	What is the problem?															
	Company culture	What are the root causes?	X	X	X	X	X	X	X	X			X		X	X	X
	Organization knowledge	What role does my function play?															
	Regulation compliance	How can I fix this?															
Product & Service Life Cycle Executives & Managers	Competitiveness	Why does this concern me?															
	Time to market	What is the problem?															
	Benchmarking	What are the root causes?	X	X	X	X	X	X	X			X	X			X	X
	Standard compliance	What role does my function play?															
Product & Service Life Cycle Executives & Managers	Regulation compliance	How can I fix this?															

Figure 1: Audience Guide

The first part of the handbook is foundational. It offers principles and charts a path for business executives to follow.



Principles to Anchor the Work

The purpose of principles is to remind us that we are committed to ethical ideals – guides that lead us towards good: treating people and the planet morally correctly. They may seem abstract, but without principles human actions can go astray very quickly and lead to places no one wants to go.

An anchoring principle is the center around which all other values orbit. Guiding principles help to make the anchoring principle clearer and more concrete in its applicability. It can sometimes be difficult to operationalize very vague ethical principles, so more specification is often necessary. Each of the principles we share has sub-principles, which we call specifying principles since they do just that – become more specific. Additionally, we offer examples of how these very specific principles can then be turned into action principles. Action principles are those that can be used in real time business decisions about how to act or respond to actions that have occurred in the development or use of technology. Action principles can be developed and used for all business activities, not just the use of technology, but in the handbook, we focus on those business activities connected to technological development and use. For specifying principles and examples of action principles, see Appendix 2 of the *ITEC Handbook*, or the Markkula Center Website: [ITEC Principles and How to Use Them: Anchoring, Guiding, Specifying, and Action](#).³

The *ITEC Handbook* proposes the following anchoring and guiding principles:

Anchoring principle

Our Actions Are for the Common Good of Humanity and the Environment

Guiding Principles

- 1. Respect for Human Dignity and Rights***
- 2. Promote Human Well-Being***
- 3. Invest in Humanity***
- 4. Promote Justice and Access***
- 5. Recognize that Earth is for All Life***
- 6. Maintain Accountability***
- 7. Promote Transparency and Explainability***

However, just having principles, even more detailed specifying and action principles like those offered in the handbook, is not enough: ethics is the art and science of good action and so these principles must be made real: they must be implemented, ***operationalized***.

³ ITEC, “ITEC Principles and How to Use Them: Anchoring, Guiding, Specifying, and Action,” *Markkula Center website*, June 2023, available at: <https://www.scu.edu/institute-for-technology-ethics-and-culture/itec-principles/>



The Roadmap

The *ITEC Handbook* provides the roadmap for that operationalization. The multi-stage process described here provides everything that an organization needs in order to implement *responsible technology for the common good*, a systematic approach to managing ethics in an organization.

The most efficient way to develop and implement the required new responsible technology management system is to know your starting point, where you want to be at the end of the journey and follow a well-planned roadmap. This does not mean that there is only one way to get there. Each organization has unique needs based on where they are in their own ethical transformation journey. Those which are further along have already invested time and money can use the proposed roadmap as a checklist. For those organizations still in the early stages, the RTMS Roadmap is a structured approach for this enterprise-wide transformational journey which can easily be customized by selecting the modules which are of interest.

The roadmap is divided into 5 stages:

1. Technology Ethics Leadership Discernment & Direction: *Commitment*
2. Current Technology Ethics & Management Practices Baseline Assessment: *Self-Assessment*
3. Technology Governance Framework Definition: *Framework Development*
4. Mindset & Culture / Product & Service Life Cycle Management System Planning & Implementation: *RTMS Implementation*
5. Responsible Technology Management System Ongoing Operations & Continuous Improvement: *RTMS Operations Control*

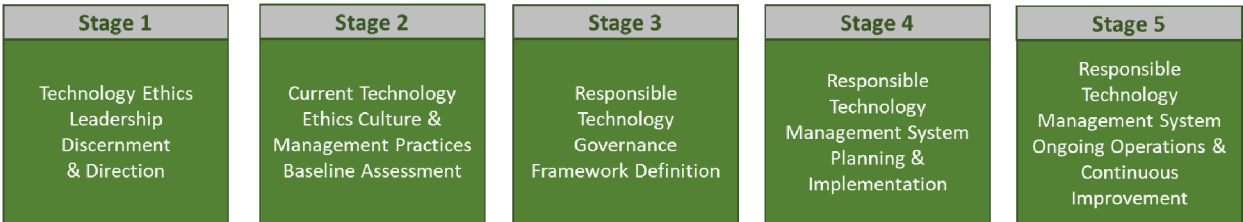


Figure 4: ITEC Operationalization Roadmap

The metaphor of a journey can help to make the stages more clearly understandable. Before starting on any journey, a person or group must first decide to go. This decision and commitment is Stage 1. Second, now that they have decided to embark, they need to figure out exactly where they are – often people think they know this, but discover they don’t. Imagine being at sea in the era before GPS; for the travelers to assess their starting location they need to use the tools they have available: what the *ITEC Handbook* provides in Stage 2 is the equivalent of an “ethical GPS.” Third, they



need to decide upon their destination: Stage 3 provides a vision of the end goal and what will be accomplished by the end of the journey. Fourth, the travelers need to plot a course from their current local to their destination and start navigating through their environment; Stage 4 describes this for both the culture of an organization and the products & services development process. Lastly, in Stage 5, the travelers need to monitor their progress and stay on their course without wandering off, getting distracted or tired, or otherwise delaying their advance.

It is important to remember that an organization's journey towards operationalization may not be so direct and linear as it is depicted here. Often grassroots and/or ad hoc efforts will begin in the middle stages and only after a while realize that earlier and/or later stages have been missed. In this case those stages will need to be explored and strengthened to allow the later stages to reach their full potential.

The Responsible Technology Management System - RTMS

The practical focus of the ethical transformation is to develop a Responsible Technology Management System (RTMS) built around two interconnected management subsystems:

The Mindset & Culture Management System, and
The Product & Service Life Cycle Management System

These align the enterprise and stakeholders for social, technical, and business success – a success that includes the common good of humanity and the environment.

Implementation of the two management systems creates a culture where everyone feels ownership for thinking through the consequences of the technology, and accountability for its impact on humanity and the planet.

RTMS includes control processes for measuring performance on an ongoing basis, ensuring that the work defined in operating plans is being carried out according to plan, and modifying the plan when required.

RTMS is what the organization does to ensure its products and services, throughout their life cycle, focus on stakeholder ethical values, increase human flourishing, including that of future generations, and the promotion of healthy and sustainable life on this planet, satisfy customer requirements, comply with applicable regulations, and achieve continual improvement of their ethical performance.



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The Operationalization Roadmap is the plan outlining the successive stages of the enterprise technology ethics transformation journey to implement and operate an agile Responsible Technology Management System.

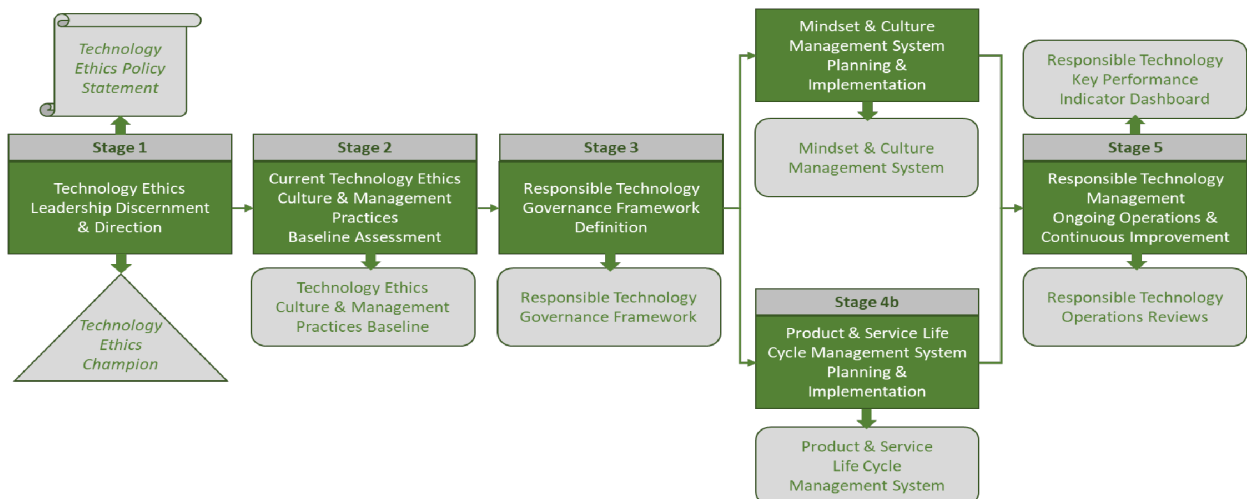


Figure 12: ITEC Operationalization Roadmap

Conclusion

The *ITEC Handbook*, with its five-stage plan, is a practical way to operationalize technology ethics within an organization. But it is not easy. The details listed in the handbook cover much of the necessary material, but the specific situations that given organizations find themselves in will necessitate even more “thinking work” not to mention practical work.

No book, no matter how long, can specify everything that needs to be done in a particular company. In the end, a book can help, but the ultimate place that these ideas must exist is not in books but in people, and specifically the people working in the organization, making that organizational culture come to life.

Ethics is about pursuing the good and avoiding doing wrong. It is about how to live one’s own life and live together with other people in a way that ultimately benefits everyone. Ethics benefits organizations, it benefits businesses, it benefits people, and it benefits the environment. But again, ethics can do nothing without people embodying it in their own lives. Good people are the foundation of ethics, and organizations like businesses, while able to help people live out their best selves, are in the end only one part of society. They can’t make an ethical society on their own, but neither are they free to avoid doing their part.

It is the sincere hope of the authors that the readers of the *ITEC Handbook* will have a clearer vision for how to operationalize ethics and find it easier to turn good intentions into a good reality in their organization.

