

ETHICS IN THE AGE OF DISRUPTIVE TECHNOLOGIES

AN OPERATIONAL ROADMAP

THE ITEC HANDBOOK



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ITEC
THE INSTITUTE FOR TECHNOLOGY,
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Disclaimer: This book is intended to provide guidance for ethics efforts and ESG efforts, but it is not meant to function as legal advice or management advice. ITEC is a collaboration of the Markkula Center for Applied Ethics at Santa Clara University and interested people in business and technology and has levels of expertise in all these areas. However, as an ethics center we are delivering a document where we provide the ethical concepts and frameworks, while organizations then apply their own management and legal judgment.

TABLE OF CONTENTS

| | |
|--|-----------|
| Foreword..... | 5 |
| A Word from Rome..... | 7 |
| A Word from the Executive Director of the Markkula Center..... | 9 |
| Preface | 10 |
| Rationale..... | 11 |
| Executive Summary | 15 |
| Part 1: Overview of the Responsible Technology Management System Operationalization Roadmap ... | 18 |
| Introduction: Principles and Their Operationalization | 19 |
| Overview: The Responsible Technology Management System – RTMS..... | 25 |
| The RTMS Operationalization Roadmap: Five Stages to Success..... | 28 |
| Part 2: Responsible Technology Management System Operationalization Roadmap Stages | 36 |
| Introduction to Part 2..... | 37 |
| Stage 1: Technology Ethics Leadership Discernment & Direction..... | 41 |
| Stage 2: Current Technology Ethics & Management Practices Baseline Assessment..... | 51 |
| Stage 3: Responsible Technology Governance Framework Definition..... | 61 |
| Stage 4a: Mindset and Culture Management System Planning and Implementation | 72 |
| Stage 4b: Product & Service Life Cycle Management System Planning and Implementation | 83 |
| Stage 5: Responsible Technology Management Ongoing Operations & Continuous Improvement..... | 94 |
| Conclusion | 100 |
| Appendices | 101 |
| Appendix 1: Examples of Technology Ethics and Responsible Technology Principles..... | 102 |
| Appendix 2: Principles for Responsible Technology for The Common Good | 107 |
| Appendix 3: Technology Ethics Policy Statement Example..... | 117 |
| Appendix 4: Responsible Technology Performance Measures and Control Process | 118 |
| Acknowledgements | 131 |
| Author Biographies | 132 |
| Works Cited..... | 133 |

Foreword

I started as a skeptic. I said to myself: we already do this. We're doing fine. We don't need a handbook about *this topic, do we?*

But when I engaged in this project, I realized this is critically important and yes, we need this handbook now more than ever. Some companies may be doing well right now, but it is another thing to be prepared in a deep sense for whatever the world will throw at your organization: a pandemic, international geopolitics and war, and technology constantly changing society in fundamental ways.

There are so many questions about the appropriate use of technology that it is difficult to know where to start. The recent introductions of ChatGPT and similar technologies are the start of another layer of complexity; AI-powered facial recognition and surveillance are fighting crime, but making mistakes while doing it; social media is balancing between freedom of speech and bullying, misinformation, and enabling crimes. That is to mention just a few.

Then there are the questions of not just “can we do” something, but “should we do” something: Should we use a voice recognition system that has trouble with accented speech? Should we have a targeted marketing campaign that excludes certain groups of people? Should we track people's online activity and whom they engage with – how much is acceptable and how much is creepy?

And then there are the extreme violations of business practices – such as the FTX cryptocurrency exchange debacle, stories of unethical and even illegal practices brought forth by whistleblowers, and controversies with various companies that have led to SEC charges.

In other words, there is a deficiency of ethics not only at the level of the social impacts of technology, but at the level of the corporations themselves who are making and using these technologies. There has already been a “techlash” against the industry because of the above actions and more. The industry does not have the high reputation it once had. There is also a level of urgency if we want to maintain the hard-earned reputations of the industry and those of us who work in it. The impact is apparent as technologies continue to accelerate social change and smaller and smaller numbers of people gain more and more power to change society – for better or for worse. The public is taking notice. Do we like this world? Can we do better? And I believe the answer is – we can do better, and this book is the how.

The contemporary situation demands a powerful response, and that is exactly what the *ITEC Handbook* presents: a comprehensive and detailed plan for improving the ethical management of organizations from top to bottom. Certainly, many businesses already do so much to maintain their good reputations, but even the best businesses can learn from the ideas in this handbook.

CEOs and all executives have long clearly defined the ethical principles and codes of ethics their employees must follow while executing business processes. Their governance focuses on what has historically been the ethical critical factor: the human aspect. An increasing number of business processes now rely on advanced technologies such as AI, machine learning, encryption, tracking, and others. This book offers a practical roadmap and recommendations to executives and managers to help them extend ethics governance to technology-fueled processes, and how to implement it across all functions and processes to mitigate risks throughout the entire life cycle of the enterprise's products and services, and build sustainable shareholder value.

Once the required mindset and culture shifts and ethically aligned product/service life cycle processes are in place, the book recommends a simple continuous improvement and control process to ensure that the day-to-day work defined is being carried out according to plan and course corrections are applied when required.

Authored by three experienced professionals bringing their own diverse fields of expertise, conceptualizing skills and language, the *ITEC Handbook* offers practical solutions written in a comprehensible way for the different functions within an organization.

Their metaphor – of using these tools as a way to see better, like getting glasses – really gets at the heart of the *ITEC Handbook*. While you might already see well, it is always possible to see even more. This handbook gives “*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.*” It's not about forcing, but seeing and setting up new paths for positive transformation within a company.

It is my sincere hope that the *ITEC Handbook* becomes a milestone in the history of business and its relationship with technology and ethics. It is also just a beginning, an opening for more conversation, which is so important during this time of rapid change. When I was CEO of Western Digital, I wish I had had this book – not because we were in any way ethically deficient, but rather because after reading this I realize we could have been even better: seeing more and doing more.

I hope this book will inspire you too, to take your great motivations and intentions for your organization and turn them into actions that make your company the best that it can be and help create a better world for all.

Steve Milligan
March 2023

A Word from Rome

I am very pleased to welcome the launch of the *ITEC Handbook* – it is the fruit of a somewhat unlikely cooperation between the Markkula Centre for Applied Ethics, experienced professionals from the technology and management sectors, and the Centre for Digital Culture of the Vatican’s Dicastery for Culture and Education. I am particularly grateful to the lead authors for the generosity and competence of their contribution. The process which they directed, and which has culminated in this publication, has been an exercise in integrating various forms of expertise, of listening to and learning from each other.

Since I have begun meeting and talking with senior representatives of Silicon Valley, especially those working in the area of artificial intelligence and machine learning, I have been impressed by their desire to maintain high ethical standards for themselves and for their industry. This is already clear in the number of initiatives that seek to ensure that technology will be at the “service of humanity,” “for good,” “human centered,” “ethical by design,” and “open.” This desire to maintain ethical standards reflects both an intrinsic commitment to doing good and a realistic aversion to the risk of reputational damage and long-term commercial harm. What is truly remarkable is the degree of consensus that has emerged in terms of defining the ethical values that should guide research and development in technology – values such as inclusion, transparency, safety, fairness, privacy, and reliability are consistently identified as central to the proper pursuit of innovation in technology and feature in the value propositions of organizations and companies of very different types. It is also very reassuring to note the high ethical commitments of professionals working in the sector which has at times found expression in their refusal on grounds of conscience to work on projects that they see as damaging to human well-being.

This handbook is the product of a desire to help highly motivated and well-intentioned executives to embed these shared principles in the culture of their companies and of the industry in general. In doing so, it recognizes the legitimate plurality of belief and value systems of those who work in the technology sector and appeals to the basic human ideals and values that can, and have, commanded a general acceptance. It seeks to identify processes and mechanisms that will ensure that there is a consistent and intentional focus on ethics in the decision-making and operational practices of companies. It is intended as a work in progress which will be updated and expanded in the light of feedback from those who choose to apply it in their organization.

It may come as a surprise to some to discover the Vatican’s engagement with this project but it is ultimately the result of meetings – “encounters” to use one of Pope Francis’ favorite words – between the Vatican and the world of technology. The handbook is a concrete result of a desire to promote an inclusive conversation between the technology sector and the broader human community whose future will be shaped in so many ways by decisions made by those who are

managing innovation. This is a conversation that must include those of diverse nationalities, of various cultures, and of different faiths and none, so that we learn together how to build a better world for all.

Paul Tighe
March 2023

A Word from the Executive Director of the Markkula Center

Steve Jobs famously said; “The people who are crazy enough to think they can change the world are the ones who do.”

The purpose of this handbook and of the ethics center I oversee is not just to change the world, but to help change the world for good.

This handbook is the result of several years of conversations, discussions, debates, analysis and contemplation. Our hope is to provide a comprehensive guide for companies, companies producing technology or immersed in technology, so they may in earnest work toward a common good.

We believe a company can be successful, make a profit, and still not cause harm to the planet or people who inhabit that planet.

This requires more than just closing our eyes and hoping for the best. What is proposed here is an open-eyed, clear-headed, systematic blueprint toward designing and guiding a company, using well-conceived and time-tested systems that can increase accountability and produce ethical and responsible products and services.

Let’s change the world...for good.

Don Heider
May 2023

Preface

Leaders want the best for their organization. They do not want to go down in history as the ones who harmed or destroyed it, but rather as ones who encountered challenges and faced them, guiding their enterprise to a better future. Leadership requires knowledge, a clear vision, good judgment, the right resources, and leaving nothing to chance. And within those categories is another one, the foundation of not only good business practice, but all human society: ethics.

Ethics is the bedrock upon which people build everything else. Good ethical relationships create trust, and trust is what every social institution relies upon. Without it, relationships fall apart, and if enough social relationships fall apart, one is no longer living in a society, but anarchy.

While this book does not seek to address such large-scale social questions, it does directly address one of the most important levers of power in society: business and other organizations developing or working with advanced technologies. If some businesses and their technologies harm society, society will degrade, and if enough businesses and their technologies help society, society will improve. Enterprise leaders are not just business leaders, but also prominent leaders in society. They are looked up to and admired, or reviled, depending on the way they act. Their actions are fundamentally entangled with ethics, and they set the tone for their segment of society.

And yet, if the choices of business leaders are so vital for the well-being of society, why would any make choices that are misaligned with this goal? There are many reasons, but one of them is simple lack of awareness and knowledge of how to set the right ethical tone across their organization and operationalize ethical thinking in every process in such a way that bad choices become less common, and hopefully quite rare.

The purpose of this handbook is to empower business leaders and help them make a positive change in their companies – with the plan, tools, and resources that they need to operationalize these changes for the common good.

We present it looking to continue a dialogue and invite responses. Ethics is never a finished work and so this handbook will develop over time as well. We look forward to your thoughts.

José Roger Flahaux
Brian Patrick Green
Ann Gregg Skeet
May 2023

Rationale

The Handbook in Two Sentences

As technology makes the world more complex, the choices that we need to make regarding the uses of technology also become more complicated. The goal of this book is to help decision-makers set up the right conditions within their organization for successful navigation of this increasing complexity so that their good intentions generate the best outcomes not only for their organization and shareholders, but for society and the world as well.

Why does this concern my company?

Technology is now ubiquitous, and companies that fall behind in technology will increasingly fall behind, period. 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 unthinkable, can now be automated. For example, visual inspections of complex components are now routinely conducted at very high speed using machine vision.

Machine learning is allowing the automation of increasingly complex activities, such as self-driving cars. But of course, autonomous weapons, often relying on similar technologies, are frightening examples. AI can also help develop new products, ranging from software to new pharmaceuticals. Sooner rather than later, most companies will rely on AI and other advanced 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's 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.

We are not developing technology solutions. Why does this concern us?

A relatively small number of companies have the capability of developing the most advanced technologies, but most companies will adopt 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 they want to buy and use these products and services, and 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 and must wield it wisely.

Aren't good intentions enough? Why do I need a handbook?

Good intentions are great, and most people have good intentions, including in their businesses. There are very few people who want to actively harm the world. And yet, despite this fact, the world is not anywhere near perfect; clearly there is some disconnect that requires work. This disconnect between good intentions and good outcomes can only be solved through careful *operationalization*: turning intentions into reality, or in other words, ethical principles into practice.

Like most handbooks, ours is a collection of instructions 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.

This handbook provides a bridge between theoretical ethical principles, management concepts, and detailed guidelines to operationalize them across the entire organization. *Operationalization* is *how* to put those principles and concepts into practice at all levels of the enterprise and throughout the entire life cycle of the products and services it offers.

Because different levels of management require their own type of information, this handbook has different sections for various audiences. CEOs and C-suite executives require executive summaries, while front line leaders need more detailed guidance to develop practices and processes. A guide for reading the handbook is below.

What is the goal of this handbook?

The primary goal of this handbook is to help companies developing, procuring, or leveraging advanced technologies understand the ethical risks that such technologies introduce, and help them implement the infrastructure necessary to mitigate those risks throughout the product and service life cycle.

The *ITEC Handbook* offers a structured methodology to guide enterprises on their journey of transformation from leadership discernment and commitment, to operationalizing ethical and humane use principles, into a new mindset and culture of technology ownership and accountability, where everyone thinks through the consequences of the technology and feels accountability for its impacts on humanity and the planet.

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.

How do I use this handbook?

The *ITEC Handbook* is not intended to be read from beginning to end by all readers. After reading the high-level overview, most readers will jump to the parts that cover their specific areas of expertise or interest. 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 Guide

| 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? | | | | | | | | | | | | | | | | |
| Human Resources Executives & Managers | Focal point | What do I need to learn? | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| | 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 | 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: ITEC Handbook Audience Guide

Executive Summary

The path from discernment to commitment to technology governance and action

The Context

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.

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. If industry leaders do not quickly adopt an actionable and reliable legal and ethical framework with demonstrable effectiveness, they will quickly find themselves trapped in a quagmire of inconsistent and even contradictory laws and regulations.

At the same time, there is no lack of interest in the private sector to ensure that technologies be “ethical by design.” This is motivated not only by an intrinsic concern to act ethically, but also by the desire to avoid reputational damage, to create corporate cultures that attract top talent and retain the commitment of ethically alert employees. As part of this process many of the leading corporations working on these novel technologies are taking leading roles in trying to shape the regulatory framework in a way to avoid limiting innovation and yield advantages to companies operating in unregulated jurisdictions.

Many companies have already identified their ethical principles and guiding values and have attempted to elaborate codes of ethics. However, they often fall short when trying to operationalize those principles and values at the enterprise level. They desire to develop and adopt solutions that meet customer requirements and contribute to the common good of society while avoiding societal harms, but exactly *how* to do so is elusive. In the demanding business environment in which success often depends on speed to market and user adoption, organizations are struggling to avoid negative impacts from the technologies they create, such as discrimination, misinformation, threats to human safety, and threats to privacy. Only by adopting a framework with consistent and

auditable practices and procedures can industry effectively implement ethical standards that function throughout a system's entire life cycle.

The challenge companies face in giving primacy to ethical issues is heightened by the legal and governance obligations of directors when confronting these same ethical issues. For the last half century directors have been instructed that the end of corporate governance should be to maximize long-term shareholder value, so long as any actions taken are legal and satisfy the board's basic sense of ethics. What is best for other corporate stakeholders, such as communities, the operation of society, employees, and consumers, must be viewed through a lens that correlates to enhancing shareholder value. This theory, known as "stockholder primacy," with its focus on increasing profitability or long-term shareholder value, has been justified as necessary to prevent directors from supporting social or political causes that do not relate directly to corporate profits. Pursuant to the stockholder primacy model other stakeholders, whether they be employees, consumers or society, are protected by other bodies of law.

While in recent years there have been some challenges to the stockholder primacy model, and new corporate structures and models are being developed to give boards greater discretion to consider other issues, the legal system governing most corporations remains based on the stockholder primacy model. Similarly, while some institutional investors have urged corporate boards to give a greater focus on E(nvironmental), S(ocial) and G(overnance) issues, corporate boards and managers are still judged primarily on the profitability of the enterprise.

As a result, a critical challenge facing business leaders in the new world of AI and advanced technologies is 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. A factor that potentially further complicates this issue is that corporate law today gives corporations substantial ability to influence the development of legal, regulatory and social policies that govern the use of these new and powerful technologies. As a result, only by successfully demonstrating the effectiveness of ethical values as they are adopted and applied can a corporate board truly establish a framework that allows the enterprise to satisfy its obligations to its stakeholders, including taking into account the ethical, social and policy issues created by these groundbreaking technologies.

All these considerations have led to the industry's patchwork approach to ethical product and service development. What remains missing is a logical, practical, scalable, and repeatable framework that companies can rely on not only to achieve their goals, but also to demonstrate effectiveness through metrics and auditable processes.

That need is what the *ITEC Handbook* fills.

The Management Challenge

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 stockholders, governments, policy makers, civil society, academics, and employees)
- 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

The Practical Solution

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

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, to make it pronounceable: “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 (Stage 3).
- **Responsible Technology Management System (RTMS)** – The Mindset & Culture and Product & Service Life Cycle interconnected management subsystems (Stages 4a and 4b) aligning the enterprise and stakeholders for social, technical, and business success for the common good of humanity and the environment.

PART 1

Overview of the Responsible Technology Management System Operationalization Roadmap

Introduction:

Principles and Their Operationalization

Time to Get Eyeglasses

Have you ever had trouble seeing? Did you get used to blurry vision, or squinting, or moving things closer or farther away to see them clearly?

When we experience these sorts of problems, we are likely to first ignore them, but after a while we might go to an optometrist and get our eyes tested for glasses or contact lenses. After receiving our new lenses, we might be surprised at how clear the world looks! And for a while we might remark to our family and friends that we can see things clearly that we haven't seen before, or not for a long time.

Relatively speaking, very few people have perfect vision, and even fewer people have anything like a perfect ethical sense, particularly when it comes to new and less-explored fields such as technology ethics. In fact, it might turn out that with respect to certain new things to see, nobody starts out having very good vision. We might be in a cave and need a flashlight or be looking for distant birds and need binoculars.

Technology challenges us with new things to see, ethically speaking, and when these things first appear they may go unrecognized, or seen but only dimly, 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, which is gained with the right eyeglasses or other tools for seeing and thinking about these problems.

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 must be aligned with the goal of attaining clear ethical vision. Some people may have better eyesight than others, but if an organization is properly structured that sight can be shared and shape the whole organization for the better.

Before we can achieve an aim, we have to see it. As a metaphor, eyeglasses and vision connects well to the ITEC name. For example, ITEC can be thought of as “eye-tech,” i.e., corrective lenses, and parts of this book can be thought of as an “eye test” to measure sight.

Additionally, the Responsible Technology Management System – RTMS – that we describe here is easy to rename *Artemis* – the Greek goddess of the hunt – who also had keen eyesight, which was necessary for her to pursue and achieve her aims. In this case, the aim is to create a

better world by creating better organizations – ones which are responsive to the contexts in which they find themselves and which seek not only to do well for themselves, but for everyone.

The 21st Century: A Dynamic World in Need of Humane Values

Business is changing. The rapid development of technology, historical events such as pandemics, widespread misinformation, wars, and social transformations encouraging ethics in business, including both the ESG (Environmental, Social, and Governance) and the technology ethics movements, have created a world that is unlike anything we have ever seen before. While the fiduciary duty to shareholders by boards and executives remains, the context around it is becoming broader, more long-term, and more sustainable.

Organizations are trying to keep up. One major way they are doing this – especially in the technology sector – is by adopting ethical principles for the responsible development of technology. Many lists of these principles exist and can be found in Appendix 1.

In this handbook we offer our own set of principles. They are designed to be comprehensive and adaptable to many organizational and business contexts. These principles should not be thought of as set in stone; rather we offer them, after much experience, research, and careful thought, as a starting point for organizations to customize for their own contexts. Those businesses that have already developed their own principles may not benefit from our suggestions. Other businesses may choose to adopt them verbatim. Still others may choose to modify our suggested principles or amend their own existing principles to align with those we recommend.

The purpose of principles is to remind us that we are committed to ethical ideals – guides that lead us toward good: treating people and the planet morally correctly. They may seem abstract, but without principles human actions can quickly go astray and lead to places no one wants to go. Principles give us something to aim at, to seek and pursue, and ultimately to realize as the fulfillment of our efforts.

Anchoring Principle: Our Actions Are for the Common Good of Humanity and the Environment

The anchoring principle is the center around which all other values orbit. In this handbook we choose the above anchoring principle, which includes not only the benefit of all humankind, but also benefit for the environment. While these are made explicitly separate here, in fact they are not, since the flourishing of contemporary and future humans is completely dependent upon the flourishing of our environment. If we want to have a healthy organization – including its owners, leaders, employees, customers, and all stakeholders – we need to think comprehensively in terms of the well-being of the society in which we all live as well as the well-being of the environment, which is the precondition for human existence and flourishing.

Guiding Principles

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

The guiding principles help make the anchoring principle clearer and more concrete in its applicability. It can sometimes be difficult to operationalize vague ethical principles, so more specification is often necessary. Respecting dignity and rights, promoting well-being, investing in humanity, promoting justice, access, diversity, equity, and inclusion, recognizing that Earth is for every living thing (not just humanity), maintaining accountability, and promoting transparency, together all serve the common good.

For more details on the above suggested principles, as well as further specifying and action principles, see Appendix 2, and the Markkula Center website: [ITEC Principles and How to Use Them: Anchoring, Guiding, Specifying, and Action.](#)¹

However, principles are only a starting point; they are not enough. Ethics is the art and science of good action and so these principles must be made real: they must be implemented, *operationalized*.

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.

But before presenting a new system, it is important to understand why current systems fail.

Why Current Systems Fail: Five Reasons

There are five basic reasons why current efforts at technology ethics fail.

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

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/>

- a) Meaningfully or potentially meaningfully **impacted by**, and/or
- b) Meaningfully or potentially meaningfully **impacts** the product/service.²

Direct stakeholders are the internal stakeholders (employees and shareholders), users, opponents of the product or service, and external authorities, and **indirect stakeholders** are those who are not users but are still affected by the products or services.

To ensure that the enterprise works for the common good, leadership should recognize and account for the ethical value requirements of the direct *and* indirect stakeholders while developing products and offering services.

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 toward ethical outcomes. Sometimes unenthusiastic leadership will appease stakeholder (particularly employee) desires for ethics with symbolic gestures and under-resourced efforts, all the while maintaining the status quo. These organizations may have plenty of skills and resources, but because they lack leadership buy-in, their efforts are prone to failure, particularly where competing objectives (such as the desire to quickly launch a product) are prioritized.

Note that this is the “normal” and almost default cynical view of most outsiders who presume an organization could fix problems if it chose to. They believe decisions are instead based purely upon greed and that the organization’s actions and statements are merely hollow public relations gestures meant to placate stakeholders. Thus, even when a company genuinely intends to adhere to ethical principles, the failure to fully commit to doing so, particularly at the senior management level, will lead to reputational damage from skeptical stakeholders.

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.

Implementing responsible technology is difficult and requires a concerted, coordinated effort. It requires expertise, communication, transparency, self-awareness, and processes that include checks and balances needed to evaluate and assess risks and benefits. Leadership might put a great deal of thought into adopting principles, and then exhort employees to follow them, but without further support, expertise, organization, and effort, this is not enough to transform a corporate culture or create responsible new technologies. Here too, competing priorities can signal the death knell of ethical goals. Most businesses are effective at launching products and achieving

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/>

business goals, but without investment in understanding how to achieve ethical goals, outcomes will always be imbalanced.

4. Failure to comprehensively assess risks. Even when an organization has the know-how 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. As another example, a company might develop principles and create an ethics committee to evaluate new technologies but fail to institutionalize these efforts in a comprehensive way, leaving out data gathering and analysis from committee meetings and failing to follow up on product ethical improvements. This leaves the implementation spotty and hopeful at best.

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 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. For example, some companies with strong reputations for ethics have gone through leadership changes that have caused their ethical cultures to atrophy and eventually fail in serious ways, resulting in major economic losses and even deaths, such as in the case of the Boeing 737 MAX. Responsible technology efforts must be seen as a business priority and maintained through constant effort. Most importantly, the leadership of the organization must “stick with the program.” If a new corporate leader is not interested in ethics efforts, then the ethical culture of the organization will be at serious risk. Only through the adoption of a comprehensive ethical developmental framework can an organization create significant barriers to this sort of atrophy.

As you will see, all these above failure modes – and more – are specifically addressed in this handbook, with solutions.

A Positive Framing

Everything that can be framed negatively, as a failure to avoid, can also be framed positively, in terms of some good sought after. In this book we will often switch 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, and there really are bad things that need to be avoided. 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, directly or indirectly, 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 ethically.

- 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 and 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.

Positive framing raises hope and optimism. It shifts the ethical footing from evasion to pursuit, putting agency and initiative in the hands of leaders and employees.

Ethics is not merely about evading dangers, it is about achieving excellence, and every successful company already understands the meaning of excellence when it comes to creating products and services. Again, pursuit requires keen vision, fast footwork, and careful aim.

Lastly, note below that the ITEC theory of change is framed positively.

ITEC Theory of Change

To deliver products and services that benefit the common good for humanity and the environment, organizations must:

- 1. Know the ethical requirements not only of their customers, but also their internal and external stakeholders.** This awareness motivates positive change.
- 2. Transform their enterprise mindset and culture** into one in which everyone considers the consequences of the technology they are developing, and everyone feels accountability for the impact of their products and services upon humanity.
- 3. Operationalize their Responsible Technology Governance Framework** by implementing 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 they offer.

Overview: The Responsible Technology Management System – RTMS

The Responsible Technology Management System is 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.

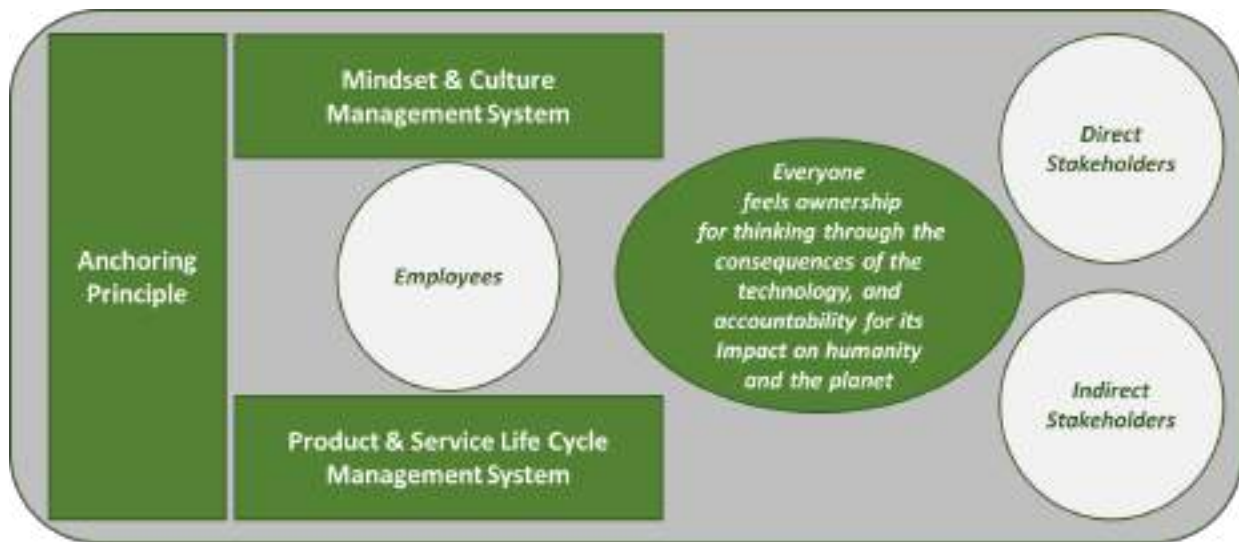


Figure 2: ITEC Enterprise Responsible Technology Management System (RTMS)

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.

Responsible Technology Management System Fundamental Values

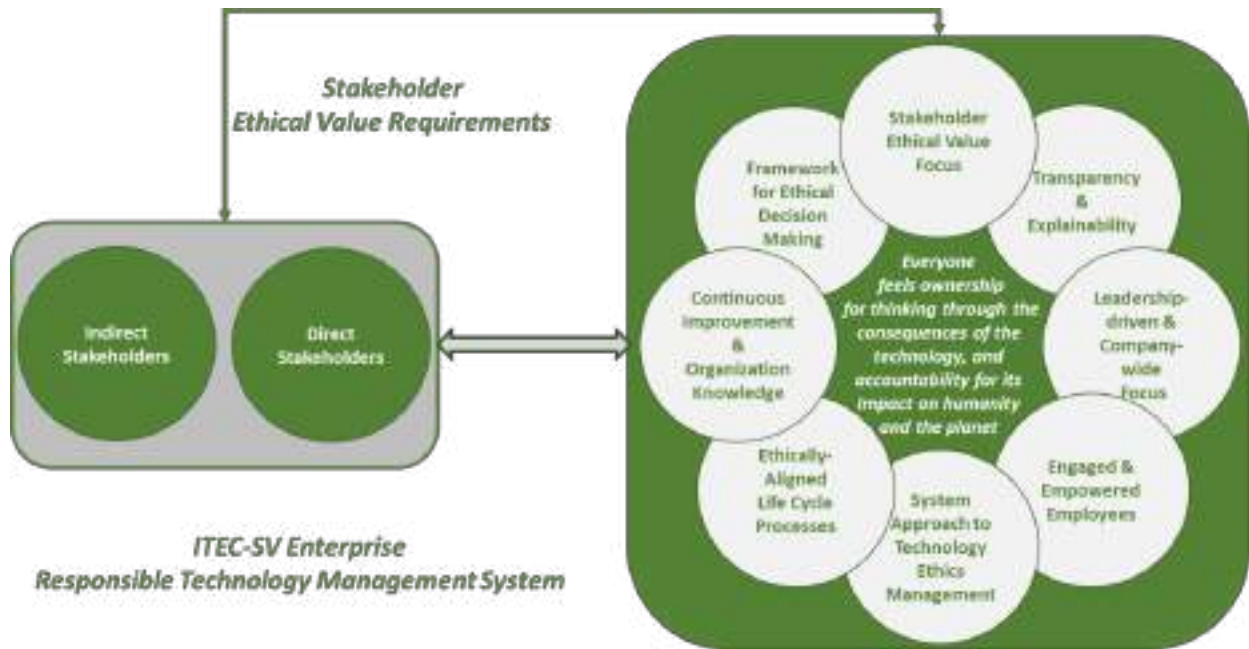


Figure 3: ITEC Responsible Technology Management System Fundamental Values

Eliciting and holding paramount stakeholder ethical value requirements throughout the product and service life cycle is the foundational value of the Responsible Technology Management System.

Tasks undertaken by *Engaged and Empowered Employees* are part of *Ethically Aligned Life Cycle Processes*; they are carried out through the lenses of an enterprise *Ethical Decision-Making Framework*. This organization-wide focus is driven by the Enterprise *Leadership* to build *Organization Knowledge* and practice the discipline of *Continuous Improvement*.

Transparency and Explainability ensure that sufficient and appropriate information regarding how the developers have addressed the stakeholder ethical concerns is shared in a form understandable by the recipients.

The Structure of this Book

This book has a two-part layout followed by appendices.

In Part 1 we give an overview of the responsible technology management system operationalization roadmap.

In Part 2 we dive into this system in more detail.

In the Appendices we explore several specific areas in more depth.

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 they have achieved the level they desire.

The Audience Guide in the Rationale section might help with knowing what to read, depending on what you are seeking.

In the next section we will explore the Responsible Technology Management System at a high level.

The RTMS Operationalization Roadmap: Five Stages to Success

The most efficient way to develop and implement the Responsible Technology Management System is to know your starting point, where you want to be at the end of the journey, and then to 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 that are further along have already invested time and money and 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 that can easily be customized by selecting the modules which are of interest.

The roadmap is divided into 5 stages:

1. Technology Ethics Leadership Discernment and Direction
2. Current Technology Ethics and Management Practices Baseline Assessment
3. Technology Governance Framework Definition
4. Mindset and Culture / Product and Service Life Cycle Management System Planning and Implementation
5. Responsible Technology Management System Ongoing Operations and Continuous Improvement



Figure 4: ITEC Operationalization Roadmap

It is important to remember that an organization's journey toward 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.

Stage 1: Technology Ethics Leadership Discernment & Direction

Decision before All Else

Before anything else, an organization must decide that this transformation toward ethical technology is important and that they are not only willing to make this transformation, but willing to put in the effort and resources required to fully operationalize this transformation.

In some organizations, half-hearted efforts toward ethical transformation lead to confusion and frustration. In the worst cases, half-hearted efforts can lead customers and employees to become upset, some may leave (willingly or unwillingly), scandalous stories emerge, and multiple relationships of trust are damaged or destroyed. Despite the danger of half-hearted efforts, making no effort at all toward ethics is undoubtedly worse. In all cases, reputations are at risk, not only of individuals, but of organizations and entire industries – as shown by the social media industry’s fall from grace over the mid-to-late 2010s.³

Technology-ethics leadership (Board of Directors and C-suite) buy-in, commitment, and direction is the desired outcome of this critical first Stage, which is owned by the CEO or the Technology Ethics Champion. To effectively discern what, if anything, should be done to address technology ethics at the enterprise level, the Board of Directors, and key executives, should first be briefed on customer and stakeholder needs, socio-technical responsibility, and state-of-the-art technology ethics practices. The fiduciary duty to pursue long-term sustainable shareholder value is assumed, with the understanding that it will benefit from ethical business practice (certainly the opposite – unethical practice – can seriously harm long-term shareholder value).

Discussions must take place to understand the impact of advanced technologies on the enterprise’s social responsibility, as well as the external and internal risks of doing nothing or not enough. These initial steps should be followed by an initial assessment of the current technology management mindset, culture, and management practices.

Review of the initial assessment report will lead to the desire and decision by the enterprise’s leadership to focus, or not, on technology ethics. The scope of the effort, and the resources needed, should be defined and agreed upon. This decision should be translated into a formal “Technology Ethics Strategic Initiative” (see Part 2, Stage 1) led by the Technology Ethics Champion.

Before this strategic initiative can be announced to all employees, an anchoring principle and an Enterprise Technology Ethics Policy Statement must be produced (see Appendix 3 for a sample of what this document might look like). These two foundational documents and the appointment

³ Michelle Quinn, “Social Media’s Year of Falling from Grace,” *VOA (Voice of America)*, December 28, 2018, available at: <https://www.voanews.com/a/social-medias-year-of-falling-from-grace/4720477.html>

of an executive-level technology ethics champion will signal to all employees the intent and commitment of the leadership. They are the key deliverables of this stage.

| | | | | | |
|--------------------------------|--|----------------------------------|--------------------------------|---|--|
| Stage Owner | Technology Ethics Champion | | | | |
| Desired Outcome | Technology Ethics Leadership (BOD & C-Suite) Buy-In, Commitment, and Direction | | | | |
| Stakeholders & The Common Good | Social Responsibility | Technology Ethics Best Practices | Culture & Practices Assessment | Technology Ethics Strategic Initiative: Key Success Factors | Technology Ethics Strategic Initiative |

Figure 5: Stage 1 Areas of Focus

Stage 2: Current Technology Ethics & Management Practices Baseline Assessment

Assessing Where You Are

Before starting any journey, you must assess your own starting location. Merely beginning a journey – even if moving toward a good destination – can end in disaster if you are not in the starting location that you believed you were in.

The desired outcome of Stage 2, owned by the Technology Ethics Champion, is to obtain an actionable inventory and baseline assessment of current technology-ethics mindset, culture, and management practices throughout the entire product/service life cycle.

In this stage, the Technology Ethics Champion leads the dialogue to define how the baseline assessment should be conducted. Then, the internal and external perceptions of corporate accountability and the technology ethics infrastructure should be discussed to understand the current leadership commitment and accountability.

The assessment should also include how guiding principles align with the foundational document and how aware employees are of them. The organization’s ethical decision-making framework and the ethical alignment of the product and service life cycle processes should also be addressed. Review of the current workforce diversity, recruitment policies and practices, and employee performance management will provide the employee development and empowerment baseline.

To assess the technology ethics performance management, the different categories of current key technology performance measures along the pathway to impact and the control processes in place should be reviewed.

The baseline assessment instrument should be carefully defined. A survey questionnaire and one-on-one interviews should be considered. Employees must feel comfortable sharing their input with management. Sometimes third-party organizations that can anonymize answers can be helpful for getting honest answers from interviewees who might be concerned about how their responses might be received.

| | | | | | |
|--|---|-----------------------------------|--|------------------------------------|--|
| Stage Owner | Technology Ethics Champion | | | | |
| Desired Outcome | Current Technology Ethics Culture and Management Environment Baseline | | | | |
| Leadership Commitment & Accountability | Guiding Principles & Mission Alignment | Ethical Decision-Making Framework | Product & Service Life Cycle Ethically Aligned Processes | Employee Development & Empowerment | Technology Ethics Performance Management |

Figure 6: Stage 2 Areas of Focus

Stage 3: Responsible Technology Governance Framework Definition

Defining a Responsible Technology Governance Framework

The objective of this stage, owned by the Technology Ethics Champion, is to define a governance framework connecting the enterprise and stakeholders for social, technical, and business alignment. The responsible technology governance framework is a component of enterprise governance.

This particular governance framework is the master plan for the organization to transform its culture and develop an enterprise responsible-technology management system which focuses on meeting customer requirements and stakeholder ethical values throughout the entire life cycle of its products and services. This is what the organization needs to implement to balance responsible use and technology innovation.

The anchoring principle must be translated into the elements of an ethical mindset and inclusive culture, which includes direct and indirect stakeholders in the engineering effort. It is also the foundation for the development of the policies, leadership practices, processes, and tools the organization must develop and implement in order to support an open, transparent, and inclusive culture that holds stakeholder ethical values paramount throughout the entire life cycle of its products and services.

The Technology Ethics Champion, working with department heads involved in the various phases of the product and service life cycle, is accountable for the subsequent detailed definition, implementation plans, and implementation of the Responsible Technology Mindset and Culture, and Responsible Technology Ethics Management Systems.

The Technology Governance Framework must address:

- Leadership Commitment and Accountability
- Ethical Decision-Making and Guiding Principles
- Culture, Employee Development and Empowerment
- Ethically Aligned Life Cycle Processes
- User Ethical Use Education and Compliance
- Responsible Technology Performance Management

| | | | | | |
|--|---|---|--|---|----------------------------|
| Stage Owner | Technology Ethics Champion | | | | |
| Desired Outcome | Responsible Technology Governance Framework | | | | |
| Leadership Commitment & Accountability | Ethical Decision-Making & Principles | Culture, Employee Development & Empowerment | Product & Ethically Aligned Life Cycle Processes | User Ethical Use Education & Compliance | R-T Performance Management |

Figure 7: Stage 3 Areas of Focus

Technology Governance Framework

This key document identifies 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.

The **ITEC Responsible Technology Governance Framework** illustrates the key building blocks of a responsible-technology governance framework. Each building block is briefly discussed hereafter.



Figure 8: ITEC Responsible Technology Governance Framework

The foundation of the Technology Governance Framework is its Anchoring Principle. ITEC is proposing “Our Actions Are for the Common Good of Humanity and the Environment.”

Then the framework identifies the building blocks of the enterprise’s responsible technology mindset and culture the organization must develop:

- Leadership
- Ethical Decision-Making Framework
- Guiding Principles

- Employee Development
- Employee Empowerment

Next, the framework describes the pillars the organization must focus on in order to operationalize ethical and humane use principles to ensure products and services, throughout their life cycle, focus on stakeholder ethical values. For example:

“Ethical and Humane Use” by Design Life Cycle Processes

Solutions should not adversely affect already vulnerable populations, and the underserved should be actively considered as part of the design process

User Ethical Use Education and Compliance

Users should not adversely affect other stakeholders

Responsible Technology Performance Measures and Control Process

Performance should be measured regularly to ensure adequate plan execution and continuous improvement

Implementation of the leadership-defined Technology Governance Framework will lead to a culture in which everyone feels ownership for thinking through the consequences of the technology and accountability for its impacts on humanity and the planet.

Stage 4a: Mindset and Culture Management System Planning & Implementation

Stage 4 is split into two parts: 4a and 4b. 4a concerns planning and implementing the transformation of mindset and culture, while 4b concerns transformation relating to the life cycle of products and services.

Planning for a New Mindset and Culture

Organizations have cultures, and those cultures can run the full range from wonderful to terrible. Most organizations, of course, are somewhere in the middle.

When making a transition toward more organizational emphasis on ethics, one should not assume that an organization is saying that it has done something wrong or is ethically unsound. On the contrary, choosing to try to become more ethical is itself a good ethical decision and indicative of at least some health in a corporate culture, while truly terrible organizations will run from ethics as though it were a threat.

Stage 4a is owned by the Head of Human Resources.

Using the Responsible Technology Governance Framework as a starting point, the Technology Mindset and Culture System is planned and implemented. How the project is going to be managed is an important element of the discussion. Then the plan is executed.

The system definition and the implementation plan should address:

- Leadership Commitment and Accountability
- Organizational Readiness Planning
- Responsible Technology Employee Education and Training (including ethical leadership and deliberation practices, healthy culture practices, principles and ethical decision-making)
- Employee Development
- Employee Empowerment
- Implementation Project Management

| | | | | | |
|--|--|-----------------------------------|----------------------|----------------------|-----------------------------------|
| Stage Owner | Head of Human Resources | | | | |
| Desired Outcome | Responsible Technology Mindset & Culture Management System | | | | |
| Leadership Commitment & Accountability | Organizational Readiness Planning | R-T Employee Education & Training | Employee Development | Employee Empowerment | Implementation Project Management |

Figure 9: Stage 4a Areas of Focus

Stage 4b: Product/Service Life Cycle Management System Planning & Implementation

Planning for a New Product/Service Life Cycle

The Head of Product and Service Development owns Stage 4b.

Using the Responsible Technology Governance Framework as a starting point, the Responsible Technology Management System is defined and its implementation is planned. Then the plan is executed.

The Responsible Technology Management System Definition and Implementation Plan should address:

- Stakeholder Ethical Value Requirements
- Ethically Aligned Life Cycle Processes and Action Principles
- Employee Technical Training and Certification
- Ethical Value Design and Operations Reviews
- User Ethical Use Education and Compliance
- Implementation Project Management

| | | | | | |
|--|---|---|---|---|-----------------------------------|
| Stage Owner | Head of Product & Service Development | | | | |
| Desired Outcome | Responsible Technology Product & Service Life Cycle Management System | | | | |
| Stakeholder Ethical Value Requirements | Ethically Aligned LC Processes & Action Principles | Employee Technical Training & Certification | Ethical Value Design & Operations Reviews | User Ethical Use Education & Compliance | Implementation Project Management |

Figure 10: Stage 4b Areas of Focus

Stage 5: Responsible Technology Management System Ongoing Operations & Continuous Improvement

Ongoing Operations and Continuous Improvement

In the ongoing operations and continuous improvement stage, the full Responsible Technology Management System has been implemented. The desired mindset and culture are in place, and robust ethically aligned life cycle processes are delivering ethical and humane use-compliant products and services that benefit the common good of humanity and the environment. This very important milestone should be celebrated by the organization, and deserving teams/employees must be recognized and rewarded.

This stage is owned by the Technology Ethics Champion. The focus is on performance management to ensure continuation and growth. Planning and formal regular control is essential to build upon the foundations established during the enterprise responsible technology transformation.

During ongoing operations, the following areas should be kept in mind:

- Enterprise Planning Process
- Responsible Technology Operations and ESG Reviews
- Performance Improvement
- Responsible Technology Mindset and Culture Management System Annual Assessment
- Responsible Technology Product/Service Life Cycle Management System Annual Assessment
- ESG Reporting and Public Relations

| | | | | | |
|---------------------------------|---|-----------------------------|---|---|----------------------------------|
| Stage Owner | Technology Ethics Champion/COO | | | | |
| Desired Outcome | Responsible Technology Certified Products & Services + Continuous Improvement | | | | |
| R-T Enterprise Planning Process | R-T Operations & ESG Reviews | R-T Performance Improvement | R-T Mindset & Culture Management System Annual Assessment | Product & Service Life Cycle Mgt System Annual Assessment | ESG Reporting & Public Relations |

Figure 11: Stage 5 Areas of Focus

PART 2

Responsible Technology Management System Operationalization Roadmap Stages

Introduction to Part 2

ITEC Responsible Technology Management System Operationalization Roadmap

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

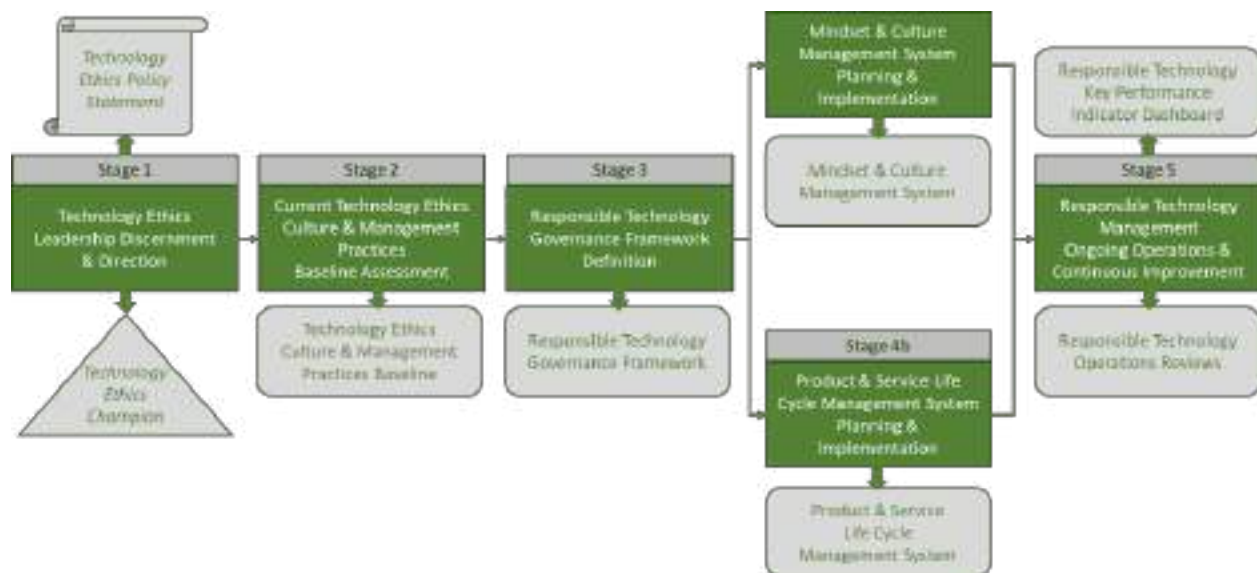


Figure 12: ITEC Operationalization Roadmap

In Part 2, we explore the stages of the roadmap in more detail. For each roadmap stage, the following elements are discussed:

- A. **Desired outcome**
- B. **Stage ownership and key participants**
- C. **Key deliverables**
- D. **Areas of focus**
- E. **Stage Exit Checklist**
- F. **Resources**

A. Desired Outcome

To focus the discussion, everyone involved must understand what is to be achieved by the end of the roadmap stage.

B. Stage ownership and key participants

Leadership education, buy-in, and commitment require *training and development* skills to educate and convince all management levels that technology ethics is part of the enterprise's social and environmental responsibility. Responsible technology governance is rooted in *change management* expertise to transform the enterprise's culture and operationalizing a new engineering management paradigm. Ultimately, Responsible Technology Management System operations are about *ongoing engineering management*, treating technology ethics as a mandatory product or service requirement, just like functional performance, quality, safety, and respect of the environment.

To identify each roadmap stage owner, keep in mind that the person with the most *ownership* is usually the one who has control over the people and systems resources, a good understanding of the overall process, the ability to effect change, the power to act, and is accountable to their supervisor for delivering the desired outcomes. Each owner must be able to relate to the needs of the various domain experts involved in the discussion, to listen to those who are bringing specialized expertise to the table and be sensitive to their jargon and conceptualizing skills.

The stage owner must ensure that the organization's key stakeholders are part of the conversation. It is important to note that a desired single outcome or set of outcomes is often the result of several departments working together with multiple stakeholders with different roles and responsibilities.

Difficulty should be expected when it comes to communication between key participants. At a conference on AI hosted at the Vatican, Boston College professor James Keenan noted that "*the discourse on artificial intelligence is occurring within very different language games. Lawyers speak legalese; theologians, theology; technicians have tech talk; and social scientists their own ways of reporting. Each field has not only its own way of conceptualizing but also different ways of assessing and judging.*"⁴ This means that different groups of people first must learn how to translate between languages enough so that they can even talk to one another.

Lack of ability to communicate also breeds misunderstanding and distrust, so parties should be aware of this and try to be sympathetic and understanding toward each other. Even so, misunderstandings are likely to make their appearance during transformation. Stage ownership and key participants will need to make these translation and communications efforts not only with each

⁴ James F. Keenan, "7 lessons learned from the Vatican's artificial intelligence symposium," *National Catholic Reporter*, Nov 2, 2021, available at: <https://www.ncronline.org/news/opinion/7-lessons-learned-vaticans-artificial-intelligence-symposium>

other, but with many other stakeholders as well. These efforts can be taxing, so be sure that adequate energy is devoted to this task. Assuming goodwill, giving others the benefit of the doubt, and asking clarifying questions can help to avoid or clarify misunderstandings.

C. Key Deliverables

This section describes the key deliverables that must be produced before exiting the current stage.

D. Areas of Focus

This portion of the roadmap template provides a high-level list of the topics that should be considered and discussed. These could include concepts that some participants are unfamiliar with. If that is the case, take the time to educate each team member to ensure a more fruitful discussion.

Each stage has a chart which identifies the key elements associated with the area of focus. These charts cover a lot of territory but should not be thought of as exhaustive – every organization is different and every context is different, so organizations should examine these charts and recognize where they might be fruitfully customized to their situation. These discussions will highlight missing elements that should be added to the chart. Updating those charts will ensure everyone is able to visualize the critical elements that must be considered to develop the required key deliverables.

E. Stage Exit Checklist

The stage exit criteria and deliverables that should be completed before the organization can move to the next stage are identified and summarized in this section. A checklist form is provided to track the activities completed as well as those in process.

F. Resources

A library of relevant reading material is provided for those looking for additional information.

How do these resources integrate with the overall goals of this handbook?

First, the resources we present are eminently practical. They are designed to be used. The very act of using these resources is the beginning of operationalizing ethical thinking. It is only a start, because further actions are necessary, but a beginning – something – is much more than nothing.

Second, the resources offer a structure and educational path for thinking, talking, training, and doing ethical work in an organization. While they are practical by design, they are also teachable. All employees, managers, and C-suite officers can learn from them to make better, more

informed decisions. These skills can be introduced and then practiced to become better at ethical decision-making.

Third, many of these resources connect to Environmental, Social, and Governance (ESG) requirements. They certainly connect to the social impact of technological products and the decisions made by corporations. They can also apply to environmental ethical questions related to product design and decision-making. And they are themselves a form of governance thinking; specifically, self-governance by engineering teams and managers over the technological development process. With further integration, these engineering team-level governance processes can be institutionalized at higher levels in the corporation, thus building a strong ethical governance structure within an organization.

Stage 1: Technology Ethics Leadership Discernment & Direction

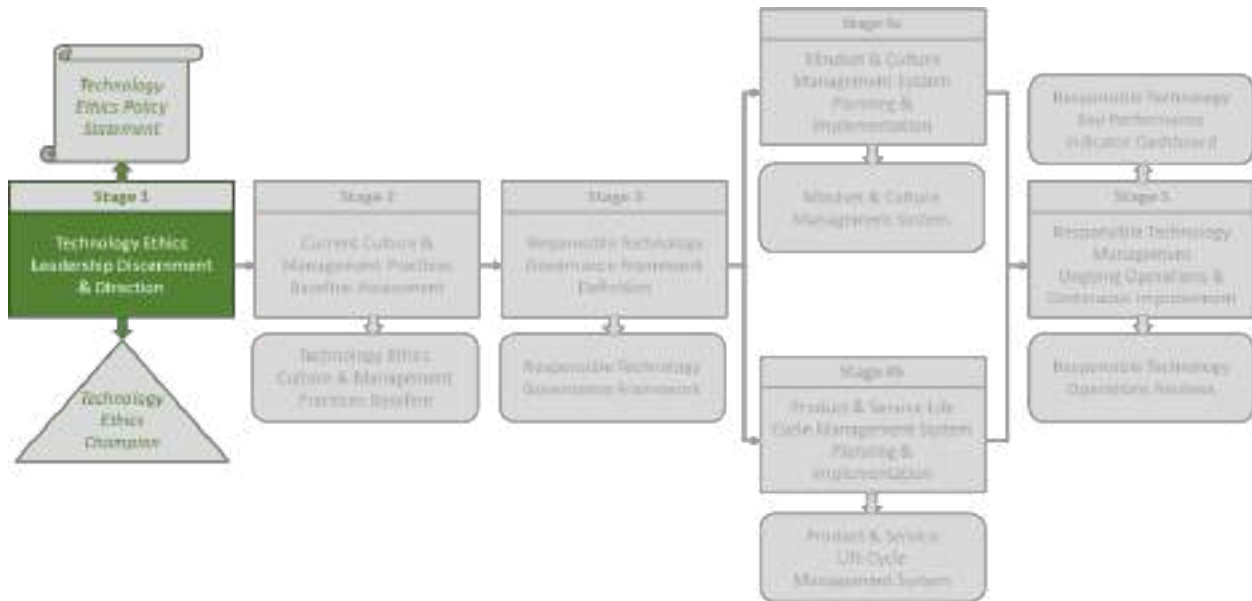


Figure 13: Operationalization Roadmap Stage 1

Decision before All Else

Stage 1 relies on a clear decision to support the transformation toward ethics. Without this clear decision the project will not proceed – or succeed – as it should.

A. Desired Outcome

The goal for this stage is leadership buy-in (Board of Directors and C-suite), commitment, and direction toward responsible technology and technology ethics.

This critical first stage may seem obvious, *but it must not be*, considering how many companies have stumbled and continue to stumble in their responsible technology efforts. Without leadership being fully on-board, stumbling is only a matter of time. Half-hearted efforts invariably lead to problems both internally and externally at these organizations.

However, despite these difficulties, there is still a powerful movement toward ethics and responsible technological development, perhaps because the purpose of responsible technology and ethics is to ultimately benefit the organization and society, not only by avoiding bad situations

and negative effects, but even more so to achieve good ends. It is better to try and stumble than to not try at all and thus continue harming society – which is, ultimately to a company and its employees, harming themselves. Making this point clear can help to gain and maintain buy-in.

The fiduciary duty to the shareholders is also clearly in mind in this stage. The Board of Directors and CEO are improving their company for the sake of the shareholders by strengthening ethical practice, which can help to avoid all sorts of harms. It is the duty of Directors to seek this improvement, both for the sake of the shareholders (legally, as a fiduciary duty) and society (ethically, as good human beings).

Leadership Education and Commitment

“Tone at the top” is a critical leadership ingredient for ethical behavior. What is less frequently discussed is *time* at the top. One of the most hopeful recent business trends is the dedication of resources within organizations to responsible technology and ethics.

Research the Markkula Center has undertaken on its own and in collaboration with organizations such as the World Economic Forum, Deloitte, the Partnership on AI, and Jesuit business schools and ethics centers reinforces our understanding that such dedicated resources have impact proportionate to the time and attention senior leadership spends on wrestling with the development of principles, the frank assessment of current culture, and the investment in the leadership competencies needed to guide the organization through the implementation of these recommended management systems transformations.⁵

The best practices of ethical leadership involve both personal attributes and organizational acts. It is this blend of being and doing that maximizes the impact leadership can have on behavior. And it is one of the reasons both tone at the top and the time and resources devoted to culture management and ethics correlate positively with ethical behavior. During this stage, the focus is on educating the Board of Directors and the C-suite and senior management teams about the commitment required. They need to be *really ready* to change.

Just regular “ready” is not sufficient. To achieve the appropriate level of leadership commitment required, the leadership team must ask itself the equivalent of whether it is *really ready*.

⁵ Markkula Center for Applied Ethics, “Resources for Leaders Managing Corporate Culture,” *Markkula Center website*, 2022, available at: <https://www.scu.edu/leadership-ethics/resources/resources-for-leaders-managing-corporate-culture/>; World Economic Forum, Deloitte, and the Markkula Center for Applied Ethics at Santa Clara University, “Ethics by Design: An organizational approach to responsible use of technology,” *World Economic Forum website*, December 2020, available at: https://www3.weforum.org/docs/WEF_Ethics_by_Design_2020.pdf; PAI Staff, “Framework for Promoting Workforce Well-being in the AI-Integrated Workplace,” *Partnership on AI website*, August 27, 2020, available at: <https://partnershiponai.org/paper/workforce-wellbeing/>; Cecilia Martínez, Ann Gregg Skeet, Pedro M. Sasía, “Managing organizational ethics: How ethics becomes pervasive within organizations,” *Business Horizons* 64, Is. 1 (January–February 2021) pages 83-92, available at: <https://www.sciencedirect.com/science/article/pii/S0007681320301233>

This is critical because change tends to be met with resistance.

The resistance comes at the beginning, in the middle, and up to – and well past – the end of the desired transformation. Leadership teams that are only *ready* to make a commitment to the responsible use of technology might experience leadership defection when the initial challenges begin. This is to be expected and prepared for.

Therefore, the work done in this first transformational stage is dedicated to educating the Board of Directors and C-suite about the commitment to be undertaken, proactively committing to the work and means of holding one another accountable, and formally initiating the enterprise-wide effort.

B. Stage Ownership and Key Participants

This stage is preferably owned by the CEO, but if not at first, then by an ethics champion – a person who is motivated and empowered to make changes in the organization to align it with ethics. The CEO must be supportive of this champion, or the process cannot work. To effectively discern what, if anything, should be done to address technology ethics at the enterprise level, the Board of Directors and key executives should participate and be consulted.

C. Key Deliverables

Leaders will know they have completed this stage when they possess the following deliverables for their organization:

Anchoring Principle – While this handbook offers one possible anchoring principle – our actions are for the common good of humanity and the environment – corporations can either customize that principle or develop their own. The key is to choose a principle that will truly *anchor* ethics in the organization. What will be strong enough to motivate ethical action and exist as a focus from which other ethical principles can flow?

Technology Ethics Champion Appointment – The technology ethics champion will be the person who makes the responsible technology transformation happen. This champion must be empowered to make this transformation, as well as be responsible and accountable for it.

Enterprise Technology Ethics Policy Statement – This statement will provide the institutional commitment necessary to empower the technology ethics champion and related functional leaders in their work, and publicly communicate the enterprise’s commitment. An example of this statement can be found in Appendix 3.

As with all significant change efforts, senior leaders will need to “walk the walk” to exemplify for the rest of the organization the commitment that is required. At least one C-suite executive, either existing or newly added, should be identified as the owner of this transformational process and this person should report to the CEO, with a dotted line to the board committee that will retain oversight for the responsible use of technology.

We recommend explicitly assigning the responsibility for the responsible technology transformation to a board committee in partnership with the CEO. While some organizations may have existing strategy and/or audit committees they feel could handle this responsibility, we encourage the exploration of creating a new committee or asking existing committees to work together on this effort to reinforce the holistic and interdisciplinary nature of the undertaking.

Though this Roadmap emphasizes technology, it will touch on all aspects of a company during transformation, not just product development, engineering, or other divisions traditionally associated with technology.

D. Areas of Focus

The following chart summarizes the key focus areas of this first stage. It provides an overall picture of the topics to be considered. The brief description provided for each one listed can be used to bring attention to the subject matter and initiate the conversation.

| Stage Owner | Technology Ethics Champion | | | | |
|---|--|----------------------------------|---|--|--|
| Desired Outcome | Technology Ethics Leadership (BoD & C-Suite) Buy-in, Commitment, and Direction | | | | |
| Stakeholders & The Common Good | Social Responsibility | Technology Ethics Best Practices | Culture & Practices Assessment | Technology Ethics Strategic Initiative Key Success Factors | Technology Ethics Strategic Initiative |
| Customer & Stakeholder Concepts | Social Responsibility Scope | Academia | Culture Assessment (Policies, Practices, IPII) | Anchoring Principle | Strategic Initiative Scope, Resources, Timeline & Budget (2020-2025) |
| Stakeholder Well-being Domains | Regulations | Consulting Firms | Product & Service Life Cycle Assessment (Policies, Practices, IPII) | Technology Ethics Champion (Role & Responsibilities) | Strategic Initiative BoD Review & Approval |
| Stakeholder Ethical Value Requirements | Enterprise External Risk Assessment (Doing nothing or not enough) | Global Initiatives | Assessment Report | Enterprise Technology Ethics Policy Statement | Strategic Initiative Kick-off |
| The Common Good of Humanity & The Environment | Enterprise Internal Risk Assessment (Doing nothing or not enough) | Standards Organizations | | Project Management | |
| | ESG Reporting | Competitive Landscape | | Communication Plan | |
| | | Future Trends | | | |

Figure 14: Stage 1 Areas of Focus

Stakeholders & the Common Good

Customer & Stakeholder Concepts

Historically, enterprises developing products or services are familiar with the notions of customer (the individual who receives or purchases a product or service) and customer requirements (what motivates customers to buy a product or service). Managers know they must focus on customer requirements and requirement compliance to ensure customer satisfaction. In the new world of AI and advanced technologies, they must also embrace the broader concepts of

internal and external stakeholders (anyone who impacts or is impacted by the organization's actions or products/services) and stakeholder well-being (the continuous and sustainable physical, mental, and social flourishing of individuals, communities, and populations where their economic needs are cared for within a thriving ecological environment).⁶ Who are our product and service internal and external stakeholders?

Stakeholder Well-being Domains

Scientifically valid measurement instruments can be used to accurately measure various well defined well-being domains. Well-being impacts on individuals and society include psychological, social, and environmental factors. Understanding what positive and negative impacts the organization might be responsible for is the first step toward making the right decisions.

Stakeholder Ethical Value Requirements

Individual and societal ethical values should be considered throughout the life cycle of products and services. How will this product affect various groups in society? How will people from different values systems from around the world react to this product? And even if some people think it is good, might it be used to harm another group in society? This focus area requires thinking about stakeholders and even consulting them to take reasonable precautions when a product or service might cause harm. (See Section F: Resources for three Microsoft tools for considering stakeholder ethical value requirements, and the IEEE standard for stakeholder ethical value requirements elicitation.)

The Common Good of Humanity & the Environment

While considering stakeholder ethical value requirements is certainly important, these values might not necessarily be comprehensive enough to achieve the common good of humanity and the environment. This is a useful perspective because it is a comprehensive approach to ethics and responsibility. The common good considers what preconditions are required for shared flourishing, such as education, healthcare, a clean environment, strong democratic institutions, the rule of law, public safety, common defense, and so on. Additionally, the common good includes not only social institutions, but also social relationships and ways to strengthen the relational glue of society; for example, by making sure employees are not overworked and have time to spend with their families and friends. Additionally, certain types of products that distract people from important relationships – for example, addictive video games (which have caused multiple infant deaths and near-deaths by neglect⁷) – might need to be redesigned to be less harmful.

⁶ IEEE, “Standard 7010-2020: IEEE Recommended Practice for Assessing the Impact of Autonomous and Intelligent Systems on Human Well-Being,” *IEEE*, 1 May 2020, available at: <https://standards.ieee.org/ieee/7010/7718/>

⁷ Andrew Salmon, “Couple: Internet gaming addiction led to baby's death,” *CNN*, April 2, 2010, available at: <http://www.cnn.com/2010/WORLD/asiapcf/04/01/korea.parents.starved.baby/index.html>; Charlie Campbell,

Social Responsibility

Social Responsibility Scope

Social responsibility includes safeguarding the fundamental condition of freedom and dignity when developing and using systems relying on advanced technologies. People should not be discriminated against by algorithms. This implies that systems must be conceived, designed, and implemented to serve and protect human beings and the environment in which they live. How do we recognize and communicate what our social responsibility is?

Regulations

Around the world, lawmakers and regulators are concerned that many activities using data processing algorithms operate in a relatively poorly regulated environment. They are issuing laws and regulations that are not always consistent. What are those regulations? What future ones are under discussion?

Enterprise External Risk Assessment

Organizations should understand the external risks associated with doing nothing or not enough. Those could include creating harmful products and services, damage to the company's image, legal and regulatory problems, loss of competitiveness, and losing business to more focused competitors. What are our external risks?

Enterprise Internal Risk Assessment

The risks of doing nothing or not enough could lead, internally, to multiple bad outcomes: poor employee morale, being unable to attract the best candidates, losing key employees, and more. What are our internal risks?

Environmental, Social and Governance (ESG) Reporting

Public companies must disclose specific information in their annual report. Reporting Responsible Technology activities and achievements shows the organization's sense of responsibility to make the world a better place for all. Companies should show regulators, customers, and their own employees that they are committed to ethically governing themselves when it comes to researching, developing, and deploying emerging technologies. Many environmental, social, and governance issues directly connect to responsible technology. How do we link technology ethics and ESG reporting?

“Gamer Dad Arrested After Toddler Dies of Neglect,” *Time*, April 15, 2014, available at: <https://time.com/63033/south-korea-gaming-toddler-death/>; Associated Press, “Police: Babies starved while parents gamed,” *NBC News*, July 14, 2007, available at: <https://www.nbcnews.com/id/wbna19766590>; Snejana Farberov, “Parents 'were so immersed in fantasy video game world where their avatars married and had jobs they let real-life daughter, 2, nearly starve to death,’” *The Daily Mail*, 11 October 2013, available at: <https://www.dailymail.co.uk/news/article-2455567/Parents-immersed-video-game-daughter-nearly-starved-death.html>

Technology Ethics Best Practices

Academia

In addition to being the source of research material, academia has several centers that have been created to provide thought leadership on technology ethics. For example, when it comes to best practices, the Markkula Center has a list of 16 [Best Ethical Practices in Technology](#).⁸

Consulting Firms

Published material from consulting firms provides a window on their work putting principles into practice to help their clients. They also report on future trends.

Global Initiatives

Global initiatives, such as the World Economic Forum (WEF), various academic organizations, gatherings of consulting firms and thought leaders, and so on, publish their work and formulate recommendations.

Standards Organizations

Organizations such as IEEE, BSI, ISO, and others have been very active in the field of technology ethics. They have published several significant standards.

Competitive Landscape

Direct and indirect competitors are a great source of information organizations can use to frame their own efforts. Company websites and published papers provide useful insight. How do we familiarize ourselves with the competitive landscape as it relates to the responsible use of technology both in our traditional industry and geographical comparisons and in some non-traditional ones that provide a more global context? Do we have a process for learning and adopting best practices?

Culture & Practices Assessment

Review of the initial assessment report will lead to the desire and decision by the enterprise leadership to focus, or not, on technology ethics. The scope of the effort, and the resources needed, should be defined and agreed upon.

Culture Assessment

Using a technology ethics lens, leadership should assess the current state of the organization mindset and culture by looking at policies, practices, and key performance indicators.

⁸ Shannon Vallor with Brian Green, “Best Ethical Practices in Technology” in “Ethics in Technology Practice,” *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/best-ethical-practices-in-technology/>

Product & Service Life Cycle Assessment

What are the current policies, processes and practices safeguarding stakeholder ethical requirements throughout the product and service life cycle from concept through end of life?

Assessment Report

When the assessment finds gaps, these should be prioritized by importance. Once prioritized, the decision must be made to remedy the gaps and a statement of work should be created to make sure that the gaps are addressed.

Technology Ethics Strategic Initiative Success Factors

These three key success factors of the strategic initiative are discussed above in the Deliverables section (C):

Anchoring Principle

Technology Ethics Champion

Enterprise Technology Ethics Policy Statement

Project Management

Rules for this enterprise-wide transformation project must be defined. Those should include documentation repository and revision control, project and management reviews.

Communication Plan

External and internal communication plans must be formulated and followed.

Technology Ethics Strategic Initiative

Strategic Initiative (Scope, Resources, Timeline & Budget Estimate)

The scope, resources, timeline, and budget estimates must be defined.

Strategic Initiative Board of Directors Review & Approval

Review and approval by the Board of Directors of this important strategic initiative is a key step that must be planned accordingly.

Technology Ethics Strategic Initiative Kick-off Event

This Kick-off Event sets a clear delineation point in the history of the organization: before this point, the formal Responsible Technology Management System operationalization process had not started; after this point, the process has begun. This should be an event that is significant and which all employees know about and participate in, in some way, even if a small one. No employee should miss that something important has happened. The kick-off should be a celebratory occasion that creates positive feelings about the changes about to occur. Before this

strategic initiative can be announced to all employees, an Anchoring Principle and an Enterprise Technology Ethics Policy Statement must be produced. These two foundational documents and the appointment of an executive-level Technology Ethics Champion will signal to all employees the intent and commitment of the leadership.

E. Stage 1 Exit Checklist

1. Do Board and C-suite members have a level of basic technology ethics literacy?
2. Are they familiar with the Principles of Responsible Technology?
3. Has the company identified a Technology Ethics Champion?
4. Have the Board and C-suite members familiarized themselves with the competitive landscape as it relates to the responsible use of technology both in their traditional industry and geographical comparisons and in some non-traditional ones that provide a more global context?
5. Has an Anchoring Principle strong enough to motivate ethical action been formulated?
6. Has the company drafted and approved a company statement of Responsible Technology, to be revisited throughout the stages of transformation?
7. Has a Responsible Technology Strategic Initiative been defined and approved?
8. Has the Responsible Technology Strategic Initiative been formally kicked off?

| Stage 1 Exit Checklist | | Owner | Target Date | Actual Date | Notes | Completion Status |
|------------------------|---|----------------------------|-------------|-------------|-------|-------------------|
| 1 | The Board and C-suite members have a level of basic technology ethics literacy | CEO | | | | |
| 2 | The Board and C-suite members are familiar with the Principles of Responsible Technology | CEO | | | | |
| 3 | A Technology Ethics Champion has been appointed | CEO | | | | |
| 4 | The Board and C-suite members have familiarized themselves with the responsible use of technology competitive landscape | Technology Ethics Champion | | | | |
| 5 | The Anchoring Principle has been formulated | Technology Ethics Champion | | | | |
| 6 | The draft of the company Responsible Technology statement has been approved | Technology Ethics Champion | | | | |
| 7 | A Responsible Technology Strategic Initiative has been defined and approved | Technology Ethics Champion | | | | |
| 8 | The Responsible Technology Strategic Initiative has been formally kicked off | Technology Ethics Champion | | | | |

Figure 15: Stage 1 Exit Checklist

F. Resources

Appendix 1 describes resources from Microsoft, IBM, Salesforce, and Google that discuss some of their efforts toward institutionalizing technology ethics in their companies.

European Union, Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022, known as the Corporate Sustainability Reporting Directive, available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022L2464>

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/>

KPMG, “An Ethical Compass in the Automation Age: Decisions require deep dive into company core values,” *KPMG.com*, 2017, available at: <https://advisory.kpmg.us/content/dam/advisory/en/pdfs/an-ethical-compass-in-the-automation-age.pdf>

World Economic Forum, “Empowering AI Leadership – C Suite Toolkit,” *World Economic Forum website*, 2022, available at: https://www3.weforum.org/docs/WEF_Empowering_AI_Leadership_2022.pdf

Stage 2: Current Technology Ethics & Management Practices Baseline Assessment

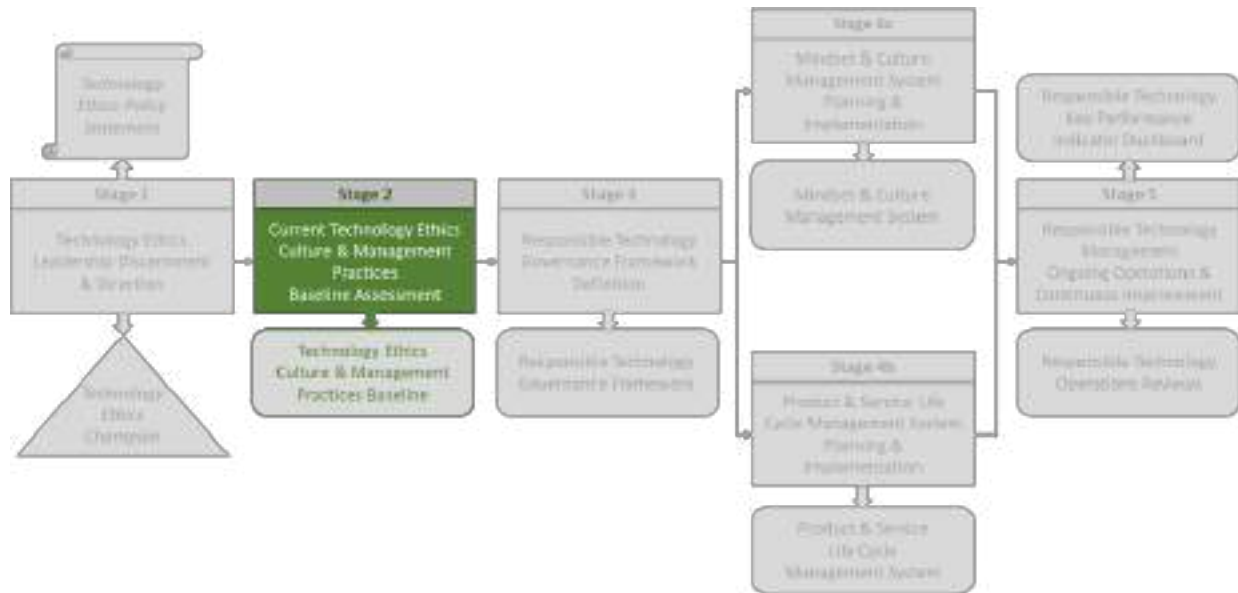


Figure 16: Operationalization Roadmap Stage 2

Assessing Where You Are

As we explored previously, you need to know where you are before you can plot a path to a new destination. In Stage 2, an organization will learn to assess its location with respect to ethics and responsible technology.

A. Desired Outcome

The organization must conduct a fair and broad assessment of its current culture and practices. The desired outcome of this stage, owned by the Technology Ethics Champion, is to obtain an actionable inventory and baseline assessment of the current technology-ethics mindset, culture, and management practices throughout the entire product/service life cycle.

B. Stage Ownership and Key Participants

This stage is owned by the Technology Ethics Champion working with C-Suite executives and senior management of Human Resources, Legal, Product/Service Development, and other functions participating in the system life cycle management.

C. Key Deliverables

Current Technology Ethics Culture and Practices Baseline Assessment Report

Current Technology Ethics Product/Service/Life Cycle Processes Baseline Assessment Report

D. Areas of Focus

| Stage Owner | Technology Ethics Champion | | | | |
|---|---|--|--|--|--|
| Desired Outcome | Current Technology Ethics Culture and Management Environment Baseline | | | | |
| Leadership Commitment & Accountability | Guiding Principles & Mission Alignment | Ethical Decision-Making Framework | Product & Service Life Cycle Ethically Aligned Processes | Employee Development & Empowerment | Technology Ethics Performance Management |
| Assessment Instrument | Guiding Principles & Foundational Document Alignment | Policies & Procedures | Ethical Requirements Consideration in the Design | Workforce Diversity Distribution | Technology Ethics Performance Measures |
| Technology Ethics Literacy | Employee Awareness of Guiding Principles | Technology Ethics Employee Training | Awareness & Application of Ethical Design Principles | Diversity Recruitment Policy & Practices | Technology Ethics Performance Control |
| Corporate Accountability External Perception | Alignment of Processes with Guiding Principles | Employee Ability to Recognize Ethical Issues & Get Facts | Ethical Value Design & Operations Reviews | Onboarding Technology Ethics Focus | |
| Corporate Accountability Internal Perception | Technology Ethics Culture Regular Assessment | Ethical Lenses Used for Evaluation | Transparency Policy | Technology Ethics Training & Certification | |
| Technology Ethics Governance & Infrastructure | | Ability to Make Decision & Test it | User Ethical Use Education and Enforcement | Empowerment Practices | |
| Internal Control & ESG Reporting | | Action & Reflection on Outcome | | Employee Performance Management | |

Figure 17: Stage 2 Areas of Focus

Leadership Commitment & Accountability

Assessment Instrument

The assessment instrument should be carefully defined. A survey questionnaire and one-on-one interviews should be considered. Employees must feel comfortable sharing their input with management.

Technology Ethics Literacy

A critical, emerging executive requirement is technology ethics literacy. At the board level, and among the C-suite, executives are now expected to be conversant with the fundamentals of ethical decision-making and tools to build a practice of ethics in technology. The literacy need for managers and employees is even greater the closer you get to the development of products and services. What is the level of technology ethics literacy at all levels of the organization?

Corporate Accountability Internal Perception

The perception employees have of the organization's policy and commitment to responsible technology affects their commitment to the enterprise.

Corporate Accountability External Perception

The perception of weak commitment to responsible technology will have an impact on the organization's ability to recruit and keep the best talent.

Technology Ethics Governance and Infrastructure

Leadership must recognize the level of governance currently provided and its impact on the infrastructure. Are we providing any technology ethics governance? Do we have the right infrastructure?

Internal Control & ESG Reporting

Is responsible technology compliance part of the ESG report, and is the internal control process addressing it?

Guiding Principles & Mission Alignment

Guiding Principles & Foundational Document Alignment

Organizations may or may not already have ethical principles or other foundational documents – such as a mission statement – that have an ethical valence to them. If these documents do not exist, then creating them will be the task for Stage 3. If these formal documents are lacking, an organization can look for implicit ethical values in their corporate culture and make them explicit, can look back at their history or founders for ethical ideals, or can survey employees for values that might be suitable for formalization into principles and foundational documents. What are the guiding principles? What are the foundational documents? Do they align with the guiding principles?

Employee Awareness of Guiding Principles (How they relate their own work with them)

In order for foundational documents and principles to have effect, they must be known and understood. If these documents and principles do already exist, then their efficacy should be evaluated. Do employees know about these principles? Do the principles positively influence behavior? Employees should be surveyed and interviewed to gather this information.

Alignment of Processes with Guiding Principles

To deliver Responsible Technology products and services, processes must be aligned with guiding principles. What is in place to ensure alignment of these processes with the guiding principles?

Responsible Technology Culture Regular Assessment

Culture will need to be assessed on an ongoing basis to measure not only the starting place but the ongoing state of the organization's culture. Are the organization's efforts making positive movements in the organizational culture? Or are these efforts having no effect or even a negative effect? Only by regular assessment can the efficacy of interventions be known.

Ethical Decision-Making Framework

Policies & Procedures

Organizations typically have policies and procedures to help govern the activities of their employees. For this assessment stage we need to ask: Does the organization have policies and procedures that govern ethical behavior? If so, then these should be checked for efficacy and alignment with the full responsible technology management system that is being implemented. If not, then these policies and procedures can be developed in alignment with the new system.

Technology Ethics Employee Training

Employees need to be trained to understand what technology ethics is, how it affects them, and how they should respond to it. If an organization already has these efforts, they should be evaluated for efficacy and improved as needed. If an organization does not already have ethics training, these should be developed and implemented in Stages 4a and 4b.

Employee Ability to Recognize Ethical Issues & Get Facts

The Markkula Center [Framework for Ethical Decision Making](#) is the basis for the next four paragraphs.⁹ It is a tool for thinking about how to make ethical decisions. Because this tool can be so useful in organizational contexts it would be helpful to know if employees already have some understanding of the requirements for making ethical decisions. Most people do, but only have this knowledge tacitly. This ability can be assessed with surveys or interviews asking employees to recognize ethical issues and what they would need to know in order to begin thinking about how to solve these issues – the first steps in the Framework for Ethical Decision Making.

Ethical Lenses Used for Evaluation

How do employees think about solving problems? Do they recognize there are multiple approaches to or “lenses” for ethics; and if so, how many approaches to ethics can they name or use? This can be assessed through surveys that measure what approaches employees recognize, such as rights, justice, utilitarianism, common good, virtue ethics, and care ethics.

Ability to Make a Decision & Test It

Employees should be able to think of multiple possibilities for action, not just a simple yes/no but other options as well. Luckily many people in technology and management are already skilled in certain types of decision making and so they might only need to think about situations they already are familiar with in a new light. Some employees are likely to find ethics to be difficult or frustrating, however. In this step the organization is seeking to see how creative its employees are at coming up with good creative solutions to ethical problems, and then mentally checking to see whether their possible choices might withstand the opinions of society, trusted family members, a

⁹ Markkula Center for Applied Ethics, “A Framework for Ethical Decision Making,” *Markkula Center website*, November 8, 2021, available at: <https://www.scu.edu/ethics/ethics-resources/a-framework-for-ethical-decision-making/>

TV interview, or social media. By asking “what would someone I trust say about this?” one can sometimes quickly discard the worst ideas and close in on much better ones. Surveys with these sorts of hypothetical situations and questions can help assess the organization’s culture on this point. Are all employees able to make an ethical decision and test it?

Action & Reflection on Outcome

Lastly, once a decision is made, can an employee determine how best to implement this decision? This assessment checks for the ability to best implement ethical choices, and then reflect on whether these choices turned out well or poorly. More details on the Markkula Center Framework for Ethical Decision Making can be found on the [Markkula Center website](#).¹⁰

Product/Service Life Cycle Ethically Aligned Processes

Ethical Requirements Consideration in the Design

Engineers design and develop products and services that meet the specifications they have been given. This is how needs such as functionality, quality, safety, and environmental impact are systematically addressed throughout the development life cycle. Attention to technology ethics requirements must be defined before the design process starts. What is the current process for including ethical requirements in the design? Are employees following the process?

Awareness & Application of Ethical Design Principles

Developers should be aware of guiding principles and understand how they relate to their own work of translating the ethical requirements through the different layers of the product/service, all the way down to algorithms. What is the process for ensuring this happens?

Transparency Policy

Different categories of stakeholders expect and require different kinds of transparency. Does a policy exist to provide the right people with the right information?

User Ethical Use Education and Enforcement

To not adversely affect other stakeholders, users should be made aware of the system benefits and potential harms caused by inappropriate usage. The company policy should reflect this concern, and enforcement rules should be addressed in user agreements. What is the policy regarding user education and enforcement?

¹⁰ Ibid.

Employee Development & Empowerment

Workforce Diversity, Equity, & Inclusion Distribution

Like ethical understanding, diversity, equity, and inclusion also need to be assessed in an organization, as well as attitudes toward diversity, equity, and inclusion. In what ways is the workforce diverse or not, equitable or not, or inclusive or not? Do employees understand why diversity, equity, and inclusion are important? This assessment seeks to find gaps to be addressed.

Diversity, Equity, & Inclusion Recruitment Policy & Practices

Organizations benefit from diversity, equity, and inclusion and so ought to seek them in their employees because this will benefit the overall corporate culture, providing insights and eliminating blind spots, as well as treating the individuals being hired fairly. Does the organization have diversity, equity, and inclusion recruitment policies and practices? Are they followed? Do they have any effect or are they ineffective? If ineffective, what might be some ways to remedy these deficiencies?

Onboarding Technology Ethics Focus

For potential employees, ethical awareness should precede onboarding and extend not only to the interview process but to external reputation, so that ethically good candidates are attracted to apply to the organization. Once hired, onboarding is the perfect time to familiarize new employees with the ethical culture of the company in even greater detail. Onboarding should include familiarization with the importance of ethics in the corporate culture and begin preparing employees to succeed in the ethical aspects of their work. In this assessment, employees are surveyed to see if their onboarding helped them to understand the organization's ethical culture, or, even better, new employees are checked on this understanding before and after onboarding training to see if the training had any effect. Does the current onboarding process address technology ethics?

Technology Ethics Training & Certification

Does the organization currently make efforts to train and certify employees in technology ethics? If so, these efforts should be assessed for efficacy and alignment with the overall principles and foundational documents of the company, and if not, these efforts should be developed in accordance with the further stages of this handbook.

Empowerment Practices

Are employees empowered to make the ethical decisions they will face? This should be assessed for the current environment of the organization, with an eye toward how to empower employees even more as the organization transforms toward responsible technology.

Employee Performance Management

How is employee performance currently managed with respect to ethical behavior? This performance needs to be measured and assessed so that the baseline is understood and can be improved upon.

Technology Ethics Performance Management

Technology Ethics Performance Measures

A fundamental principle of management is that you cannot improve performance if it is not measured. What are the current key performance measures (KPMs) used to measure technology ethics performance results along the enterprise's path to impact? Are both impact and operational measures being used, and are targets identified?

Responsible Technology Performance Control

Controlling is about measuring performance, ensuring that the work is being carried out according to plan, and modifying the plan when required. What is the current technology ethics performance control system?

E. Stage 2 Exit Checklist

1. Have the Baseline assessment instruments, plans and timelines been defined, including the target population and the survey questions?
2. Has the Leadership Commitment and Accountability assessment been completed?
3. Has the assessment of the Guiding Principles and Mission alignment been completed?
4. Has the Ethical Decision-Making Framework assessment been completed?
5. To what extent are the Product and Service Life Cycle processes ethically aligned?
6. Has the assessment of the Employee Development and Empowerment practices been completed?
7. Does an adequate process exist to measure Technology Ethics performance?
8. Is the Ethics Culture and Practices Baseline assessment report completed?
9. Is the Product and Service Life Cycle Processes Baseline assessment completed?
10. Have the Inventory and Baseline assessment of the current technology-ethics mindset, culture, and management practices throughout the entire product/service life cycle been reviewed by executives? Have they made recommendations?

| Stage 2 Exit Checklist | | Owner | Target Date | Actual Date | Notes | Completion Status |
|------------------------|---|---|-------------|-------------|-------|-------------------|
| 1 | The Baseline Assessment Instrument, plan and timeline have been defined | Technology Ethics Champion | | | | |
| 2 | The Leadership Commitment & Accountability assessment has been completed | Technology Ethics Champion | | | | |
| 3 | The assessment of the Guiding Principles & Mission Alignment has been completed | Technology Ethics Champion | | | | |
| 4 | The Ethical Decision-Making Framework assessment has been completed | Technology Ethics Champion | | | | |
| 5 | The assessment of the Product & Service Life Cycle Ethically Aligned Processes has been completed | Head of Products & Services Development | | | | |
| 6 | The assessment of the Employee Development & Empowerment practices has been completed | Head of Human Resources | | | | |
| 7 | The Technology Ethics Performance Management assessment has been completed | Technology Ethics Champion | | | | |
| 8 | The Ethics Culture & Practices Baseline assessment report has been completed | Head of Human Resources | | | | |
| 9 | The Product & Service Life Cycle Processes Baseline assessment report has been completed | Head of Products & Services Development | | | | |
| 10 | The inventory and baseline assessment of the current technology-ethics mindset, culture, and management practices throughout the entire product/service life cycle have been reviewed by executives and their recommendations are available | Technology Ethics Champion | | | | |

Figure 18: Stage 2 Exit Checklist

F. Resources

Cultural Readiness Resources

Corporate boards and senior leadership need to be able to assess their organizational ethical cultures so that they know how their organizational ethical culture is developing. The Markkula Center has an extensive set of resources for leaders seeking to enhance their corporate culture with respect to ethics in its [Resources for Leaders Managing Corporate Culture](#).¹¹

¹¹ Markkula Center for Applied Ethics, “Resources for Leaders Managing Corporate Culture,” *Markkula Center website*, 2022, available at: <https://www.scu.edu/leadership-ethics/resources/resources-for-leaders-managing-corporate-culture/>

Within the above resources, the Markkula Center’s Culture Self-Assessment Practice is one resource that can help organizations evaluate themselves.¹² The Culture Self-Assessment Practice toolkit consists of seven major parts:

[How to Do a Culture Self-Assessment](#) is a ten-step process describing how to assess organizational ethical culture. A third-party data collector engages the company and walks them through 1) determining the audience, purpose, and scope of work; 2) agreeing on data and software to use; 3) determining senior managers to interview; 4) developing a preliminary assessment design; 5) interviewing managers; 6) developing a final question set and design; 7) conducting focus groups; 8) collecting anonymous data; 9) analyzing data; 10) presenting the findings to the audience.¹³

[Defining Healthy Organizational Culture](#) is the second major document in the Culture Self-Assessment Practice materials. This document defines a healthy culture as “one that is integrated; in which individuals can thrive and participate in supported, empathetic relationships, when they are part of groups, teams, or organizations. An integrated culture is flexible, adaptable, coherent, energized and stable.” It also has nine recommendations for ways to encourage healthy organizational cultures.¹⁴

[Seagate: A Case Study in Culture Self-Assessment](#) and [A Discussion with Seagate’s Lead Independent Director](#) provide insights into the experiences of one organization that conducted an ethical culture self-assessment: Seagate. From these articles leaders can learn a bit about the culture self-assessment process and consider how it would be helpful for their organization.¹⁵

[Sample Question Sets](#) give an idea of what an ethical culture self-assessment actually looks like. This set of four questionnaires cover a wide range of issues concerning employee sentiment, experiences, and reality.¹⁶

The [Culture Assessment: A Learning Process](#) slides provide an overview of the “case” for conducting an ethical culture self-assessment in an organization. These are an example of how

¹² Markkula Center for Applied Ethics, “Culture Self-Assessment Practice,” *Markkula Center website*, 2022, available at: <https://www.scu.edu/ethics/culture-assessment-practice/>

¹³ Ann Gregg Skeet, “How to Do a Culture Self-Assessment,” *Markkula Center website*, Jun 19, 2019, available at: <https://www.scu.edu/ethics/culture-assessment-practice/culture-self-assessment-practice-process-design/>

¹⁴ Ann Gregg Skeet, “Defining Healthy Organizational Culture,” *Markkula Center website*, December 2020, available at: <https://www.scu.edu/ethics/culture-assessment-practice/defining-healthy-organizational-culture/>

¹⁵ Ann Gregg Skeet, “The Markkula Center’s Experience with Culture Self-Assessment (Seagate: A Case Study in Culture Assessment),” *Markkula Center website*, March 20, 2019, available at: <https://www.scu.edu/ethics/culture-assessment-practice/the-markkula-centers-experience-with-culture-assessment/> and Ann, Gregg Skeet, “A Discussion with Seagate’s Lead Independent Director,” *Markkula Center website*, May 21, 2019, available at: <https://www.scu.edu/ethics/culture-assessment-practice/a-discussion-with-seagates-lead-independent-director/>

¹⁶ Markkula Center for Applied Ethics, “Sample Question Sets,” *Markkula Center website*, Jun 19, 2019, available at: <https://www.scu.edu/ethics/culture-assessment-practice/sample-question-sets/>

these slides might look; in practice they could be customized for the organization where they are delivered.¹⁷

The [Resources on Culture](#) section is a compendium of resources for thinking more deeply about the importance and role of culture in an organization and how best to manage organizational culture.¹⁸

Responsible technology involves having a corporate culture that is ethically oriented and knows why it is that way. The motivational element is important: organizations need purpose in order to cohere, and the better that purpose can be, the better that organization can be as well.

Additional Resources

Steven D. Olson, “Shaping an Ethical Workplace Culture,” SHRM Foundation website, 2013, available at: <https://www.shrm.org/hr-today/trends-and-forecasting/special-reports-and-expert-views/Documents/Ethical-Workplace-Culture.pdf>

Charles Radclyffe and Richard Nodell, “Ethical by Design: Managing and Measuring Digital Ethics in the Enterprise,” *SocArXiv*, January 2020, available at: <https://osf.io/preprints/socarxiv/gj2kf/>

World Economic Forum, Deloitte, and the Markkula Center for Applied Ethics at Santa Clara University. “Ethics by Design: An organizational approach to responsible use of technology.” *World Economic Forum website*, December 2020, available at: https://www3.weforum.org/docs/WEF_Ethics_by_Design_2020.pdf

World Economic Forum and Deloitte, “Global Technology Governance Report 2021: Harnessing Fourth Industrial Revolution Technologies in a COVID-19 World,” *World Economic Forum website*, December 2020, available at: https://www3.weforum.org/docs/WEF_Global_Technology_Governance_2020.pdf

¹⁷ Ann Gregg Skeet, “Culture Assessment: A Learning Process (PowerPoint slides),” *Markkula Center website*, 2019, available at: <https://www.scu.edu/ethics/culture-assessment-practice/culture-self-assessment-a-learning-process/>

¹⁸ Markkula Center for Applied Ethics, “Resources on Culture,” *Markkula Center website*, 2023, available at: <https://www.scu.edu/ethics/culture-assessment-practice/resources-on-culture/>

Stage 3: Responsible Technology Governance Framework Definition

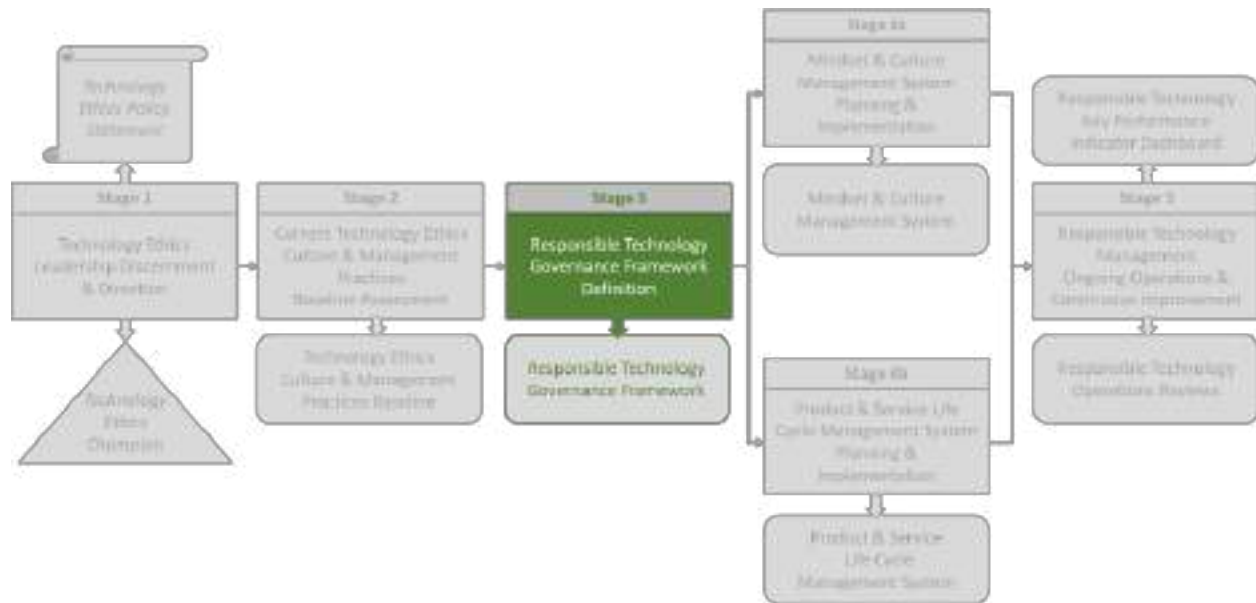


Figure 19: Operationalization Roadmap Stage 3

Putting the Pieces Together

As the third of five stages, it perhaps should be expected that defining the technology governance framework would be the crux of the process. The many pieces here are part of a roadmap, and no stage can be its best without all the others, just as no journey can be completed without all its legs. But this is the stage where much of the roadmap changes from abstract ideas to concrete, interlaced, carefully thought-out intentions.

A. Desired Outcome

The objective of Stage 3 is to define a technology governance framework connecting the enterprise and stakeholders for social, technical, and business alignment by balancing responsible use and technology innovation.

The responsible technology governance framework is a component of Enterprise Governance. It is the master plan for the organization to transform its culture and develop an enterprise responsible-technology management system that focuses on meeting customer requirements and stakeholder ethical values throughout the entire life cycle of its products and services.

B. Stage Ownership & Key Participants

This stage is owned by the Technology Ethics Champion working with C-Suite executives and senior management of Human Resources, Legal, Product/Service Development, and other functions participating in the Responsible Technology Management System.

C. Key Deliverables

Responsible Technology Governance Framework

This deliverable includes, among other things, 1) the anchoring, guiding, specifying, and action principles; 2) the set of rules, practices, and processes defining the elements of the technology ethics mindset and culture; and 3) the ethically aligned engineering management system. (A full checklist can be found below in Section E.) This critical set of deliverables should provide specific governance to all functions for the definition and implementation of the Responsible Technology Management System the organization will rely upon to meet its commitment to the common good and the environment.

D. Areas of Focus

| Stage Owner | Technology Ethics Champion | | | | |
|--|---|---|---|---|--|
| Desired Outcome | Responsible Technology Governance Framework | | | | |
| Leadership Commitment & Accountability | Ethical Decision-Making & Principles | Culture, Employee Development & Empowerment | Product & Service Ethically Aligned Life Cycle Processes | User Ethical Use Education & Compliance | R-T Performance Management |
| Leadership Accountability & Responsibilities | Ethical Decision-Making Framework | Responsible Technology Mindset & Culture | Stakeholder Ethical Value Requirements | Product/Service Use Policy & User Agreement | Outcome & Impacts Performance Measures & Targets |
| Anchoring Principle | Guiding Principles | Responsible Technology Culture Management System | Stakeholder-focused Product/Service Life Cycle Mgt. System | User Training Curriculum, Training Method, Incentive, Certification | Operational Performance Measures & Targets |
| Enterprise Technology Ethics Statement | Action Principles | Employee Development (Internal to Service, Training, Tools, & Capabilities) | Transparency Management | User Ethical Compliance Monitoring & Escalation | Performance Control |
| Technology Ethics Champion | | Employee Empowerment Practices | Accounts for Ethics (Design processes, product & technical architect) | User Notification, Remediation & Recertification | |
| ESG Reporting | | | | | |
| | | | | | |

Figure 20: Stage 3 Areas of Focus

Leadership Commitment & Accountability

Leadership Accountability & Responsibilities

Leadership is accountable for the impact on humanity and the planet of the technologies the enterprise develops or acquires. It is responsible for providing technology governance to ensure

that the technology causes minimal or no harm to individuals, the society, or the environment. It must ensure the maturity of the organization's technology governance framework and its ability to meet stakeholder ethical requirements and comply with standards and regulations.

Anchoring Principle

The principle that will truly anchor ethics at the organization should be strong enough to motivate ethical action and exist as a focus from which other ethical principles can flow.

Enterprise Technology Ethics Statement

This statement is a public declaration of how technology ethics aligns with the enterprise strategy. It defines the accountability and responsibilities the organization has for society and the environment while pursuing its vision and delivering shareholder expectations. This public institutional commitment is necessary to empower the Technology Ethics Champion and all employees in their work.

Technology Ethics Champion

This champion is the appointed accountable, knowledgeable, and trusted executive, with ability to work across organizational boundaries, who will drive and oversee technology ethics across the enterprise. They are the empowered executive who makes the responsible technology transformation happen.

ESG Reporting

This addresses leadership's guidance on reporting the organization's responsible technology transformation and its achievements.

Ethical Decision-Making & Guiding Principles

Ethical Decision-Making Framework

One of the most important components of a system to manage technology ethics is the actual process of ethical decision-making itself. In this handbook we recommend the Markkula Center Framework for Ethical Decision Making, which has been used for 35 years in many diverse settings where ethical issues arise. The framework is simple: recognize the ethical issue, get the facts of the case, evaluate the issue through multiple ethical lenses, review options and decide, test the decision, and then act. More details on this framework can be found at the end of this stage, in Section F, and on [the Markkula Center website](https://www.scu.edu/ethics/ethics-resources/a-framework-for-ethical-decision-making/).¹⁹

¹⁹ Markkula Center for Applied Ethics, "A Framework for Ethical Decision Making," *Markkula Center website*, November 8, 2021, available at: <https://www.scu.edu/ethics/ethics-resources/a-framework-for-ethical-decision-making/>

Guiding Principles

Guiding principles act by beginning to connect the anchoring principle to the real world. Because the anchoring principle is very abstract, and every ethical case is particular, guiding principles begin to make the abstract more real-life. This handbook offers seven guiding principles, each with several specifying principles. These are our recommendation, but every organization should customize their principles to their own particular situation. For more information on guiding principles, see Appendix 2 and [the Markkula Center website](#).²⁰

Action Principles

Even guiding principles and their specifying principles can still be too abstract for the particular ethical cases that one may experience on the job. For example, one might have a guiding principle or specifying principle that one ought to protect user data privacy. When looking directly at a piece of code or a database, however, what would this mean? It might, for example, mean that the care given to the data ought to be proportional to its potential to cause harm, which then ought to lead to the action principle that says something like “user data should be end-to-end encrypted with encryption of *[fill in the blank]* strength based on the sensitivity of the data as described by *[fill in the blank]* classification system.” Note the great specificity of this action principle: so specific that it cannot be fully described here in the abstract. Action principles are very context-sensitive. More information on action principles can be found in Appendix 2 and on [the Markkula Center website](#).²¹

Culture, Employee Development & Empowerment

Responsible Technology Ethics Mindset & Culture

This is the mindset and culture that needs to be developed: a culture in which everyone feels ownership for thinking through the consequences of the technology, and accountability for its impacts on humanity and the planet.

Responsible Technology Management System

The leadership, principles, practices, processes, and key performance measures that must be put in place to transform the culture and ensure its continuous improvement.

Employee Development

Practices should be put in place to sharpen the organization’s focus on stakeholders and their ethical requirements, and to help employees improve their skills and knowledge to carry out their

²⁰ 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/>

²¹ Ibid.

daily responsibilities. Recruiting for diversity, focused employee onboarding, and technology ethics training and certification should be considered.

Employee Empowerment Practices

Providing the means for employees to feel ownership for thinking through the consequences of the technology, and accountability for its impacts on humanity and the planet, helps them make ethical decisions, ensure those decisions are correct, and that employees will be rewarded for their actions.

Product/Service Ethically Aligned Life Cycle Processes

Stakeholder Ethical Value Requirements

In addition to customer requirements, organizations must understand their internal and external stakeholders who may be impacted by their technology. The ethical value requirements of those stakeholders should be elicited and translated into the specification of new designs.

Stakeholder-focused Product/Service Life Cycle Management System

This 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 promote healthy and sustainable life on this planet; satisfy customer requirements; comply with applicable regulations; and achieve continual improvement of their ethical performance.

Transparency Management

Transparency requirements for products and services, and the processes used to design them, must be identified and included in the design specification. Compliance with applicable regulations and standards should be clearly stated.

Accounts for Ethics

The ethical and technical activities undertaken during the design of responsible technology products and services should be formally recorded for future ethics assessments.

User Ethical Use Education & Compliance

Product/Service Use Policy & User Agreement

Organizations should be committed to ensuring that users do not adversely affect other stakeholders. An enterprise policy and user agreements should reflect this commitment.

User Training

Users should be made aware of the potential benefits of the product/service, as well as harms resulting from inappropriate use.

User Ethical Compliance Monitoring & Escalation

Ethical compliance monitoring as close to real time as possible should be defined to ensure immediate escalation and swift action.

User Notification, Remediation & Recertification

Actions defined in the user agreement should be carried out. Remediation and user recertification should be considered.

Responsible Technology Performance Management

Outcome & Impacts Performance Measures (including Targets)

Organizations should select responsible technology key performance measures (KPMs) that clearly represent their intended business, social, and environmental *outcomes*. The chosen *impact* KPMs should relate to individual and community stakeholder well-being.

Operational Performance Measures (including Targets)

Operational KPMs should include input, activity, and output performance measures that align with responsible technology performance improvement efforts around commonly shared strategic goals and objectives. Performance targets should be identified.

Performance Control

To ensure the work defined is being carried out according to plan and course corrections are applied when required, formal executive and operations reviews should be conducted on a regular basis.

ITEC Responsible Technology Governance Framework

The **ITEC Responsible Technology Governance Framework** shown in Part 1 Stage 3 (Figure 8) illustrates the key building blocks of a responsible-technology governance framework.



Figure 21: ITEC Responsible Technology Governance Framework

By the time Stage 3 is complete, all the above boxes will have been addressed in some form.

E. Stage 3 Exit Checklist

1. Has the Anchoring Principle been reviewed and approved by the Board of Directors?
2. Has the Board reviewed and approved the Enterprise Responsible Technology Statement and the proposed ESG reporting?
3. Has the governance for Leadership Commitment and Accountability been defined?
4. Are the Ethical Decision-Making Framework and Guiding Principles defined?
5. Is the governance for Ethically Aligned Life Cycle Processes defined?
6. Is the governance for User Ethical Use Education and Compliance defined?
7. Is the governance for Responsible Technology Performance Management defined?
8. Has the Responsible Technology Governance Framework been reviewed and approved by the Board of Directors?
9. Has the Responsible Technology Governance Framework been communicated and explained to all employees?

| Stage 3 Exit Checklist | | Owner | Target Date | Actual Date | Notes | Completion Status |
|------------------------|---|---|-------------|-------------|-------|-------------------|
| 1 | The Anchoring Principle has been reviewed and approved | Technology Ethics Champion | | | | |
| 2 | The Enterprise Responsible Technology Statement and the ESG reporting have been reviewed and approved | Technology Ethics Champion | | | | |
| 3 | The governance for Leadership Commitment & Accountability is defined | Technology Ethics Champion | | | | |
| 4 | The Ethical Decision-Making Framework and Guiding Principles are defined | Technology Ethics Champion | | | | |
| 5 | The governance for Culture, Employee Development & Empowerment is defined | Head of Human Resources | | | | |
| 6 | The governance for Ethically Aligned Life Cycle Processes is defined | Head of Products & Services Development | | | | |
| 7 | The governance for User Ethical Use Education & Compliance is defined | Head of User Operations | | | | |
| 8 | The governance for Responsible Technology Performance Management is defined | Technology Ethics Champion | | | | |
| 9 | The Responsible Technology Governance Framework has been reviewed and approved | CEO | | | | |
| 10 | The Responsible Technology Governance Framework has been communicated and explained to all employees | Technology Ethics Champion | | | | |

Figure 22: Stage 3 Exit Checklist

F. Resources

The Markkula Center Framework for Ethical Decision Making

The Markkula Center Framework is a general-purpose tool for thinking about any ethical problem. Presented here is an abbreviated version. The full version can be found on the Markkula Center website.²²

Identify the Ethical Issues

1. Could this decision or situation be damaging to someone or to some group, or unevenly beneficial to people? Does this decision involve a choice between a good and bad alternative, or perhaps between two “goods” or two “bads”?
2. Is this issue about more than solely what is legal or what is most efficient? If so, how?

²² Markkula Center for Applied Ethics, “A Framework for Ethical Decision Making,” *Markkula Center website*, November 8, 2021, available at: <https://www.scu.edu/ethics/ethics-resources/a-framework-for-ethical-decision-making/>

Get the Facts

3. What are the relevant facts of the case? What facts are not known? Can I learn more about the situation? Do I know enough to make a decision?
4. What individuals and groups have an important stake in the outcome? Are the concerns of some of those individuals or groups more important? Why?
5. What are the options for acting? Have all the relevant persons and groups been consulted? Have I identified creative options?

Evaluate Alternative Actions

6. Evaluate the options by asking the following questions:
 - The Rights Lens: Which option best respects the rights of all who have a stake? ([For further elaboration, see “Rights.”](#)²³)
 - The Justice Lens: Which option treats people fairly, giving them each what they are due? ([For further elaboration, see “Justice and Fairness.”](#)²⁴)
 - The Utilitarian Lens: Which option will produce the most good and do the least harm for as many stakeholders as possible? ([For further elaboration, see “Calculating Consequences.”](#)²⁵)
 - The Common Good Lens: Which option best serves the community as a whole, not just some members? ([For further elaboration, see “The Common Good.”](#)²⁶)
 - The Virtue Lens: Which option leads me to act as the sort of person I want to be? ([For further elaboration, see “Ethics and Virtue.”](#)²⁷)
 - The Care Ethics Lens: Which option appropriately takes into account the relationships, concerns, and feelings of all stakeholders? ([For further elaboration, see “Care Ethics”](#)²⁸)

²³ Manuel Velasquez, Claire Andre, Thomas Shanks, S.J., and Michael J. Meyer, “Rights,” *Markkula Center website*, August 8, 2014, available at: <https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/rights/>

²⁴ Manuel Velasquez, Claire Andre, Thomas Shanks, S.J., and Michael J. Meyer, “Justice and Fairness,” *Markkula Center website*, August 1, 2014, available at: <https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/justice-and-fairness/>

²⁵ Markkula Center for Applied Ethics, “Calculating Consequences: The Utilitarian Approach to Ethics,” *Markkula Center website*, August 1, 2014, available at: <https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/calculating-consequences-the-utilitarian-approach/>

²⁶ Manuel Velasquez, Claire Andre, Thomas Shanks, S.J., and Michael J. Meyer, “The Common Good,” *Markkula Center website*, August 2, 2014, available at: <https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/the-common-good/>

²⁷ Manuel Velasquez, Claire Andre, Thomas Shanks, S.J., and Michael J. Meyer, “Ethics and Virtue,” *Markkula Center website*, January 1, 1988, available at: <https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/ethics-and-virtue/>

²⁸ Jonathan Kwan, “Care Ethics,” *Markkula Center website*, May 5, 2023, available at <https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/care-ethics/care-ethics.html>

Choose an Option for Action and Test It

7. After an evaluation using all of these lenses, which option best addresses the situation?
8. If I told someone I respect (or a public audience) which option I have chosen, what would they say?
9. How can my decision be implemented with the greatest care and attention to the concerns of all stakeholders?

Implement Your Decision and Reflect on the Outcome

10. How did my decision turn out, and what have I learned from this specific situation? What (if any) follow-up actions should I take?

Additional Resources on the Ethical Lenses

In cooperation with Ethics Ops:

The Rights Lens

- [How to Use the Rights Test](#)²⁹
- [How to Use the Choices Test](#)³⁰

The Justice Lens

- [How to Use the Justice or Fairness Test](#)³¹

The Utilitarian Lens

- [How to Use the Utility Principle](#)³²

The Common Good Lens

- [How to Use the Common Good Test](#)³³

The Virtue Lens

- [How to Use the Virtue and Character Test](#)³⁴

²⁹ Ethics Ops, “Rights Test,” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/rights-test>

³⁰ Ethics Ops, “Choices Test,” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/choices-test>

³¹ Ethics Ops, “Justice Test,” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/justice-test>

³² Ethics Ops, “Best Outcomes Test,” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/best-outcomes-test>

³³ Ethics Ops, “Common Good Test,” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/common-good>

³⁴ Ethics Ops, “Character / Virtue Test,” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/character-test>

Additional Resources

KPMG International, “The Shape of AI Governance to Come: A guide to creating policies, governance and oversight of AI technology,” *KPMG website*, 2021, available at: <https://assets.kpmg/content/dam/kpmg/xx/pdf/2021/01/the-shape-of-ai-governance-to-come.pdf>

Charles Radclyffe and Richard Nodell, Ethical by Design: Measuring and Managing Digital Ethics in the Enterprise, *SocArXiv Papers*, January 2020, available at: <https://osf.io/preprints/socarxiv/gj2kf/>

³⁵ Ethics Ops, “Compare Test Conclusions,” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/compare-test-conclusions>

Stage 4a: Mindset and Culture Management System Planning and Implementation

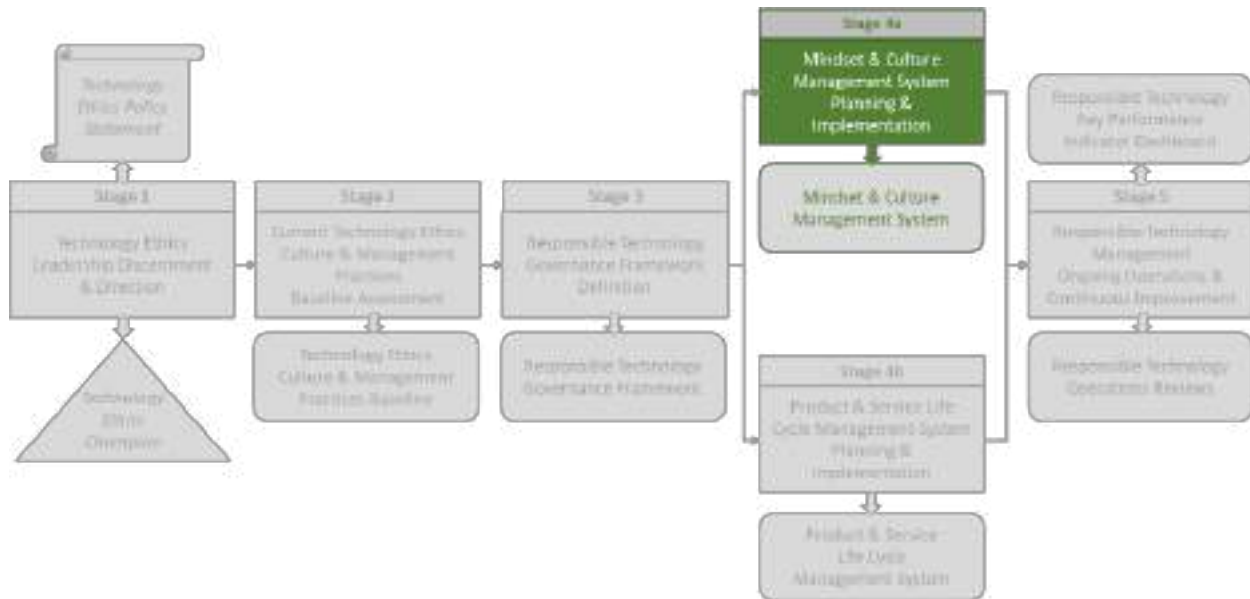


Figure 23: Operationalization Roadmap Stage 4a

Making Culture Happen the Right Way

Corporate cultures happen, whether they are intended or not. This stage describes how to plan and implement an organizational mindset and culture.

A. Desired Outcome

Using the Responsible Technology Governance Framework as a starting point, the Technology Mindset and Culture System is defined, its implementation is planned, and the implementation project is executed. The outcome is an operational Responsible Technology Mindset and Culture Management System.

B. Stage Ownership and Key Participants

This stage is owned by the head of Human Resources, with the full and public support of the CEO, working with Senior HR managers and Legal.

C. Key Deliverables

Responsible Technology Mindset and Culture Management System Definition

- Cultural Elements Inventories
- Employee Training Curriculum and Training Matrix
- Mindset and Culture Management System Performance Measures
- Mindset and Culture Management System Performance Measures and Performance Control

Responsible Technology Mindset and Culture Management System Implementation Project Plan

The Mindset and Culture Management System is operational

D. Areas of Focus

| Stage Owner | Head of Human Resources | | | | |
|--|--|---|---|---|--|
| Desired Outcome | Responsible Technology Mindset & Culture Management System | | | | |
| Leadership Commitment & Accountability | Organizational Readiness Planning | R-T Employee Education & Training | Employee Development | Employee Empowerment | Implementation Project Management |
| Building Cultural Elements & Developing Conditions | Presence/absence of Conditions for Ethics | Curriculum | Setting Targets and Plan for Recruiting for Diversity | Delegation of Authority <i>(Authority to solve problems)</i> | Project Manager |
| Modeling New Behaviors | Cultural Elements Inventory | Training Modules (including localization) | New Employee Onboarding | Resources to Carry out Authority | Detailed Project Plan (Task list, Deliverable Checklist & Due Dates) |
| Responsibility Statement (Partner Recruitment) | Deliberation Methodologies To Be Formally Replaced | Training Matrix (By job category, level, etc.,) | Employee Training & Certification | Accurate & Timely Information | Document Repository & Revision Control |
| R-T Culture Objectives & Performance Control | Opportunities to introduce, Use, Transmit Ethics | Instructors | Employee Performance Evaluation | Responsibility and Accountability | Project & Management Reviews |
| Performance Evaluation & Incentive Plan | | Training Platform | Employee Reward System | | Employee Communication Plan |
| Responsible Technology ESG Reporting | | | | | Project Kick-off Plan |

Figure 24: Responsible Technology Mindset & Culture Management System

Leadership Commitment & Accountability

Building Cultural Elements & Developing Conditions

Leadership has a responsibility for assessing organizational readiness for operationalizing ethics in organizations. Part of these responsibilities includes two key activities. The first is to ensure that an inventory of the organization’s cultural elements is completed. These fall into four areas: 1) Structural elements are aspects such as the organizational chart and internal communications mechanisms. 2) Declarative elements include things such as mission, vision, and value statements. 3) Symbolic elements include the way offices look, what people wear to work, who gets held up as exemplary, and what stories get told. 4) Normative elements include things such as the beliefs held in the organization and the kinds of behaviors that are considered taboo.

Research shows that when organizations have a healthy mix of these elements, ethics are more likely to be used in decision making.³⁶ Typically, employees can easily identify the presence of these elements and see for themselves which might need to be amplified or more fully developed and whether certain aspects are being overused.

A second activity in organizational readiness is identifying the presence or absence of certain conditions that signal an organization is primed for using ethics.³⁷ Leaders are responsible for orienting their organizations to these expectations. These include a sense of responsibility to society, creating a climate of mutual understanding and trust, and using ethical deliberation practices. Organizations can use a variety of self-assessment strategies to identify these conditions, and where they are lacking create methods for developing them.

Modeling New Behaviors

When external market forces or internal conditions lead to moments that feel like crises, these represent opportunities to introduce ethics into organizations. This seems counterintuitive to some, but typically contributes to resolving issues more quickly. When developing policy, using ethical deliberation practices such as soliciting input from those affected, considering the downstream effects of decisions, and sharing the thinking beyond those deliberations whenever possible are best practices.

Responsibility Statement

Once an organization is using a statement that defines its commitments to the responsible use of technology, those commitments should be incorporated into position descriptions. Providing employees with checklists of things to consider will aid them in updating their job descriptions to reflect a comprehensive commitment to the use of technology.

Responsible Technology Culture Objectives & Performance Control

This consists of the Responsible Technology Culture annual objectives, KPM dashboard and operations reviews, and culture annual assessments. These objectives should be part of the enterprise planning process.

Performance Evaluation & Incentive Plan (Alignment with responsible technology principles and practices identifying new skills needed)

Once an organization is using a statement that defines its commitments to the responsible use of technology, those commitments should be incorporated in annual performance reviews

³⁶ Cecilia Martínez, Ann Gregg Skeet, Pedro M. Sasía, “Managing organizational ethics: How ethics becomes pervasive within organizations,” *Business Horizons* 64, Is. 1 (January–February 2021) pages 83-92, available at: <https://www.sciencedirect.com/science/article/pii/S0007681320301233>

³⁷ *Ibid.*

whenever possible. Measuring qualities that reflect the principles and practices outlined within the performance review process reinforce their importance.

Responsible Technology ESG reporting

ESG reporting should include considerations related to the conduct of responsible technology within the organization.

Organizational Readiness Planning

Presence/absence of Conditions for Ethics

The Human Resources department should design and execute means for checking for the conditions that support the use of ethics in a community through various means of self-assessment.³⁸ These conditions include:

- A sense of responsibility to society
- Creating a climate of mutual understanding and trust
- And using ethical deliberation practices

Cultural Elements Inventory

Work teams can generate inventories around their cultural elements through surveys and as part of retreat activities. Human Resources should gather perspectives from different parts of the organization to identify any functional or geographical areas that need more support or follow-up. This inventory offers an opportunity to be sure that all ESG related outcomes are represented, with consideration given to elements that support diversity, equity, and inclusion and proper governance mechanisms.

Deliberation Methodologies to Be Formally Replaced

When committees and work groups throughout the organization complete their work, they should be asked to identify ways of aligning their decision-making processes with ethical deliberation practices.

Opportunities to Introduce, Use, Transmit Ethics

In order to leverage these opportunities, people throughout the organization need to be aware of them, particularly so they can introduce ethics at turning points or crises. When deliberation methodologies have been updated, using ethics as a regular means of decision-making becomes more straightforward, both in using the time-tested ethical paradigms and those that might be specific to an organization, typically defined by its mission, vision, and values.

³⁸ Markkula Center for Applied Ethics, “Resources for Leaders Managing Corporate Culture,” *Markkula Center website*, 2022, available at: <https://www.scu.edu/leadership-ethics/resources/resources-for-leaders-managing-corporate-culture/>

Responsible Technology Employee Education & Training

The Markkula Center for Applied Ethics has experience educating and training employees and can assist with such efforts. They may be [contacted at their website](#) to learn more.³⁹

Curriculum

Practices leaders can use to encourage ethics include a combination of modeling behavior and actions to take, and the means of ethical deliberation described above. Healthy culture can be defined by sets of actions leaders can model and encourage that promote integration across the organization.⁴⁰ When organizations have identified and articulated principles to guide the work, these should also be reinforced through regular training on healthy culture, the organization's cultural elements; and the conditions that support the use and transmission of ethics.

Training Modules

Training modules should be localized in different languages and consider local cultures.

Training Matrix

A training matrix is necessary to plan and track employee training requirements linked to their specific duties.

Instructors

The selected instructors will require sufficient training and should complete a certification program to perform their roles.

Training Platform

Leveraging existing training platforms should make in-person and digital training more efficient. If those platforms do not exist, consideration should be given to acquiring one that meets the company's overall training needs.

Employee Development

The workplace is a complex system. Within it, people can influence development at the interpersonal level through their one-on-one relationships with colleagues; at the organizational level by considering compensation structures, pathways to promotion, and other forms of recognition and professional development opportunities including multi-functional and multi-

³⁹ Markkula Center for Applied Ethics, "An Industry Leader in Ethics Consultations," *Markkula Center website*, 2023, available at: <https://www.scu.edu/ethics/about-the-center/ethics/consulting-services/>

⁴⁰ Ann Gregg Skeet, "Defining Healthy Organizational Culture," *Markkula Center website*, December 2020, available at: <https://www.scu.edu/ethics/culture-assessment-practice/defining-healthy-organizational-culture/>

disciplinary work teams; and, by engaging at the ecosystem level, making contributions to the industry or profession of which they are a part.

Setting Targets and Planning for Recruiting for Diversity

One key step is to develop an understanding and knowledge of the worldviews of people from diverse cultures and backgrounds. Armed with this knowledge and a frank assessment of the organization's stakeholders, enterprises should try to identify where they need to build both surface level and deep level (diversity of thought) diversity, as research reinforces that diverse groups work harder and reach higher quality decisions.⁴¹ Though some approaches, such as setting targets for the diversity of candidates, are used, it may be more effective to focus on the diversity of the people engaged in the hiring and to take particular care to have representation in that group. This isn't always possible if organizations lack representation to begin with, but should still be an articulated goal.

New Employee Onboarding

Orientation should include not only the organization's mission, vision, and values, but also some information about how the organization accomplishes its goals. Employee orientations that lay out basic expectations and entry points for people to participate in the complex system that is the workplace make it more likely that employees will engage fully and have confidence in doing so. The article "[Defining Healthy Organizational Culture](#)" provides one outline that organizations could use to design orientation. It begins with welcoming employees into the community, cuing them about how community creation is a shared responsibility of all participants, identifying the opportunities for integrating with other parts of the organization (though this may not be realistic in every employee's early work life in an organization), and sharing the organization's history, current state, and the aspirations and uncertainties facing the organization at any given point in time.⁴²

Employee Training & Certification

Many organizations today have a rich array of internal training opportunities. The ecosystem of professional training itself is changing rapidly, however, so identifying external sources of training and certification can help employees understand what is available to them. What is lacking at times is the overt connection between the training offered and the professional development pathway, principles and ethical decision-making rubrics being used in the organization, or in some cases, those the organization aspires to use but is struggling to activate. In addition to the principles

⁴¹ Phillips, Katherine W., and Denise Lewin Loyd. "When Surface and Deep-Level Diversity Collide: The Effects on Dissenting Group Members," *Organizational Behavior and Human Decision Processes*, vol. 99, issue 2, March 2006, pp. 143–160, available at: <https://www.sciencedirect.com/science/article/abs/pii/S0749597805001524>

⁴² Ann Gregg Skeet, "Defining Healthy Organizational Culture," *Markkula Center website*, December 2020, available at: <https://www.scu.edu/ethics/culture-assessment-practice/defining-healthy-organizational-culture/>

and decision-making rubrics used, training can be centered around the cultural elements within the organization and the conditions that support the use of ethics.

Employee Performance Evaluation

Discussion of Responsible Technology objectives and key performance measure targets with the employee, both at the beginning of the evaluation period and reviewing results at the end of the period, reinforces the organization's mindset and culture.

Employee Reward System

Even organizations with reward systems that are considered world class often fail to ask employees what is meaningful to them in terms of rewards. Would they rather have additional compensation or flexibility, opportunities for external recognition, chances to work with others in their profession, or dedicated time to work alone? A solid reward system will align with the organization's values and purpose. An outstanding one will allow for some aspect of self-identification of rewards.

Employee Empowerment

Delegation of Authority (Latitude to solve problems)

The clearest articulation of the employee's authority resides in their job description. Employees will use that and the observed practices in the organization to determine if the expressed authority attributed to their job is aligned with their actual authority. Work groups that have frequent discussions and other means of collecting input about decision-making authority have more information to work with.

Resources to Carry out Authority

Employees feel empowered when authority levels are well defined and reinforced through behavior in the organization and tools and resources are provided to accomplish their work to the appropriate level of authority.

Accurate & Timely Information

Organizations struggle with finding a balance between communicating in a timely manner and overwhelming people in the organization with internal communications mechanisms. A send-and-receive discussion within work groups and between work groups can assist in clarifying this. This involves having groups identify which information they are committed to sending from their work team, along with which information they need to receive and from which constituents in the organization to function effectively.

Responsibility and Accountability

When an organization explicitly evaluates employee actions against a set of organizational values, and when employee roles are carefully delineated, it becomes clear to employees how they are expected to carry out their authority. From day one, make clear to employees how they acquire

the professional development and training needed to fully understand and fulfill those values in their capacity at the organization.

Implementation Project Management

Project Manager

“Project performance reaches its highest level when organizational influence is centered in the project manager and influence over technical details of the work is centered in the functional manager.”⁴³ Starting from the planning phase, this major cross-functional project should be led by an experienced project manager with a demonstrated blend of technical, administrative, and interpersonal skills. The project manager must be able to evaluate the quality of the work carried out, articulate problems, and make effective decisions for resolution.

Detailed Project Plan

The project manager should lead the definition of the detailed project plan, including task lists, ownership of deliverables, and due dates.

Document Repository & Revision Control

Existing document management processes and systems should be leveraged to facilitate strict document version control, routing, and review to control execution and timely issue resolution.

Project Reviews

Formal senior management reviews and regular project manager-led project status reviews should be conducted.

Employee Communication

This enterprise-wide transformation involves and will impact all employees. They should, on a regular basis, be kept informed of the progress made. Significant milestones should be celebrated.

Project Kick-Off Plan

The purpose of the kick-off plan is to get everyone on the same page, set the right tone, and establish common goals for the successful completion of the project. It should include *who, what, where, when, why, and how* elements.

⁴³ Ralph Katz and Thomas J. Allen, “Project Performance and the Locus of Influence in the R&D Matrix,” *Academy of Management Journal* Vol. 28, No. 1.

Mindset & Culture Management System

Below is an ITEC example of the building blocks of a Responsible Technology Mindset and Culture Management System:

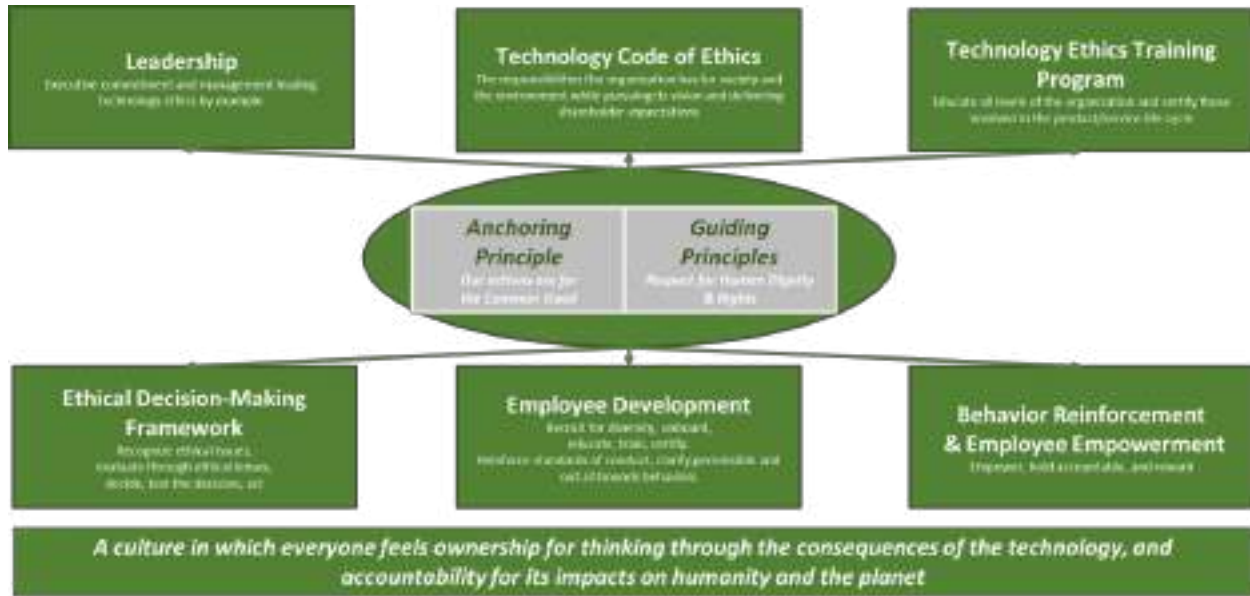


Figure 25: Example of Responsible Technology Mindset & Culture Management System

E. Stage 4a Exit Checklist

1. Have the key building blocks of the Responsible Technology Mindset and Culture Management System been identified, and owners named?
2. Has a project manager been appointed, and the project timeline defined with regular management reviews scheduled?
3. Does the Technology Code of Ethics identify the responsibilities the organization has for society and the environment while pursuing its vision and delivering shareholder expectations?
4. Have Cultural Elements been added or Conditions created to support the use and transmission of ethics in the organization?
5. Have the policies and procedures been defined for executive commitment and management leading technology ethics by example?
6. Does the Employee Development program address recruiting for diversity, onboarding, education, training, and certification? Does it reinforce standards of conduct, promote equity and inclusion, clarify permissible and out-of-bounds behaviors?
7. Does the Employee Training Curriculum and Training Matrix identify the training requirements for all categories of employees?
8. Have the Behavior Reinforcement and Employee Empowerment practices been defined to empower, hold accountable, and reward employees?

9. Are the Mindset and Culture Management System Performance Measures and their targets defined?
10. Is the Enterprise Responsible Technology Mindset and Culture Management System fully defined?
11. Is the Enterprise Responsible Technology Mindset and Culture Management System fully operational?

| Stage 4a Exit Checklist | | Owner | Target Date | Actual Date | Notes | Completion Status |
|-------------------------|--|---------------------------------|-------------|-------------|-------|-------------------|
| 1 | The key building blocks of the Responsible Technology Mindset & Culture Management System have been identified, owners have been named | Head of Human Resources | | | | |
| 2 | A project manager has been appointed, the project timeline has been defined with scheduled regular management reviews | Head of Human Resources | | | | |
| 3 | The Technology Code of Ethics identifies the responsibilities the organization has for society and the environment while pursuing its vision and delivering shareholder expectations | Human Resources Project Manager | | | | |
| 4 | Executive commitment and management leading technology ethics by example policies and procedures are defined | Human Resources Project Manager | | | | |
| 5 | The Employee Development program addresses recruiting for diversity, onboarding, education, training, and certification. It reinforces standards of conduct, clarifies permissible and out-of-bounds behaviors | Human Resources Project Manager | | | | |
| 6 | The Employee Training Curriculum & Training Matrix have been defined for all categories of employees | Human Resources Project Manager | | | | |
| 7 | The Behavior Reinforcement & Employee Empowerment practices have been defined to Empower, hold accountable, and reward employees | Human Resources Project Manager | | | | |
| 8 | The Mindset & Culture Management System Performance Measures and their targets are defined | Head of Human Resources | | | | |
| 9 | The Enterprise Responsible Technology Mindset & Culture Management System is fully defined | Head of Human Resources | | | | |
| 10 | The Enterprise Responsible Technology Mindset & Culture Management System is fully operational | Head of Human Resources | | | | |

Figure 26: Stage 4a Exit Checklist

F. Resources

Employee Education: Ethical Leadership Practice Overview

There are at least six ways leaders reinforce ethical leadership in organizations across all sectors. They encompass both the aspects of “being” and “doing” by someone in a formal leadership position. Character and actions, taken together, create a model for exploring an ethical leadership practice.⁴⁴

Additional Resources

IEEE, “Standard 7000-2021: IEEE Standard Model Process for Addressing Ethical Concerns during System Design,” *IEEE*, 15 September 2021:

<https://standards.ieee.org/ieee/7000/6781/>

IEEE, “Standard 7010-2020: IEEE Recommended Practice for Assessing the Impact of Autonomous and Intelligent Systems on Human Well-Being,” *IEEE*, 1 May 2020:

<https://standards.ieee.org/ieee/7010/7718/>

⁴⁴ Ann Gregg Skeet, “The Practice of Ethical Leadership,” *Markkula Center website*, Apr 12, 2017, available at: <https://www.scu.edu/ethics/leadership-ethics-blog/practice-of-ethical-leadership/>

Stage 4b: Product & Service Life Cycle Management System Planning and Implementation

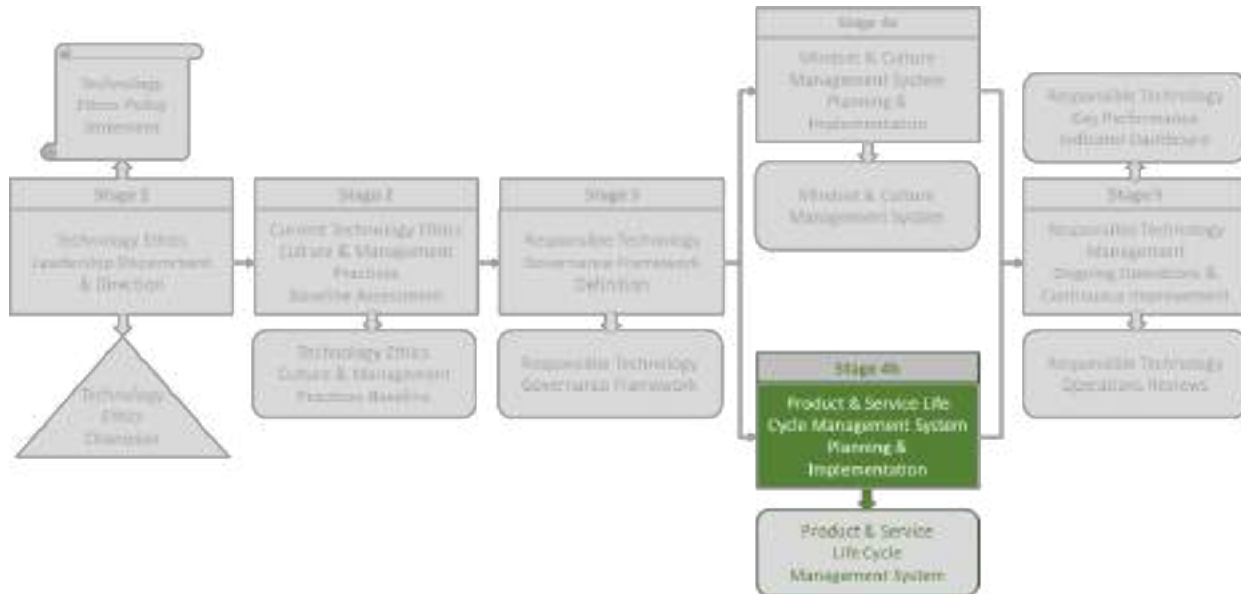


Figure 27: Operationalization Roadmap Stage 4b

Creating Technology Products that Benefit the Common Good

In this step the product and services segment of the organization makes “the rubber hit the road.” No longer just an idea for a journey, or even a roadmap, here the technological products and services of the organization – the part of the organization that directly influences many key stakeholders and even much of society – are formed toward their better ends: toward the common good of humanity and the environment.

A. Desired Outcome

This stage plans and implements the Responsible Technology Governance Framework as defined by the overall Responsible Technology Management System.

B. Stage Ownership & Key Participants

This management system planning stage is owned by head of products and services development. All functions involved in the product and service life cycle should participate. Those include:

- Product/Service Management
- Product/Service Development
- Test Engineering
- Quality
- User Operations
- Customer Support

Legal and Human Resources should be consulted.

C. Key Deliverables

Responsible Technology Product/Service Life Cycle Management System Definition

- Product and Service ethically aligned life cycle
- Ethically aligned life cycle processes and ethical use principles
- Employee technical training and certification plan
- Ethical value performance measures
- User ethical use education and compliance

Life Cycle Management System implementation plan

Life Cycle Management System operation plan

D. Areas of Focus

| Stage Owner | Head of Product & Service Development | | | | |
|---|---|--|---|---|---|
| Desired Outcome | Responsible Technology Product & Service Life Cycle Management System | | | | |
| Stakeholder Ethical Value Requirements | Ethically Aligned LC Processes & Action Principles | Employee Technical Training & Certification | Ethical Value Design & Operations Reviews | User Ethical Use Education & Compliance | Implementation Project Management |
| Direct & Indirect Stakeholders | Ethical Value & Transparency MRDs | Employee Training Curriculum & Training Matrix | Ethical Value Design Reviews | Company Policy, Usage Rules & User Agreement | Project Manager |
| Stakeholder Well-being Domains | Product & Service Ethically Aligned Life Cycle | Employee Responsible Technology Technical Fellow & Mentors | Ethical Value Performance Measures | User Training (Courses, Training Modules, Certifications, Certificates) | Detailed Project Plan (Test Int. Deliverable Overview & Use Detail) |
| Elicitation of Stakeholder Ethical Value Requirements | Action Principles | Employee Technical Onboarding | Ethical Value Operations Reviews | User Ethical Use Compliance Monitoring & Escalation | Document Repository & Revision Control |
| Transparency | Product/Service R-T Qualification & Certification | | | User Notification, Remediation & Recertification | Project Reviews (Project & Management) |
| Account for Ethics | | | | | Employee Communication Plan |
| | | | | | Project Kick-off Plan |

Figure 28: Stage 4b Areas of Focus

Stakeholder Ethical Value Requirements

Those participating in the life cycle of the products and services offered by the enterprise must understand the concepts of stakeholders and their ethical value requirements to ensure individual and societal ethical values are considered through all phases.

Direct and Indirect Stakeholders

Stakeholders are any internal or external individual or organization that impacts or is impacted by the enterprise's actions or products/services. They fall into two groups: direct and indirect stakeholders. Direct stakeholders comprise four categories: internal, users, opponents, and external authorities. Indirect stakeholders are those who are not users but are affected by the products or services.

Stakeholder Well-being Domains

Scientifically valid measurement instruments can be used to accurately measure various well-defined well-being domains. Well-being impacts on individuals and society include psychological, social, and environmental factors.

Elicitation of Stakeholder Ethical Value Requirements

IEEE Standard 7000-2021 recommends assembling ethical value engineering teams to elicit and prioritize stakeholder ethical values. This standard provides guidance on how to do so.⁴⁵

Transparency

Transfer of information to stakeholders should be truthful, relevant, and meaningful to them. Transparency requirements must be understood at the start of the product/service life cycle. IEEE Standard 7001-2021 Transparency Management defines the System Transparency Requirements of each transparency stakeholder group and the System Transparency Assessment (STA) process for validation and certification.⁴⁶

Account for Ethics (Case for Ethics)

“The Case for Ethics is a key contribution toward the organizational memory and maturity in ethically aligned design and a foundational information product for assessments.”⁴⁷ The formal record of ethical and technical activities undertaken during the design of responsible technology products and services should be available for future ethics assessments. In particular, positive impacts should be noted so that the case remains strong.

⁴⁵ 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/>

⁴⁶ IEEE, “Standard 7001-2021: IEEE Standard for Transparency of Autonomous Systems,” *IEEE*, 4 March 2022, available at: <https://standards.ieee.org/ieee/7001/6929/>

⁴⁷ IEEE Standard 7000-2021 provides a recommended content for the Case for Ethics. IEEE, “Standard 7000-2021: Standard Model Process for Addressing Ethical Concerns during System Design,” *IEEE*, 15 September 2021, Annex I, page 74, available at: <https://standards.ieee.org/ieee/7000/6781/>

Product/Service Ethically Aligned Life Cycle Processes & Action Principles

Ethical Value & Transparency Marketing Requirements Documents (MRDs)

The life cycle of products and services starts with a concept phase. This is the phase where requirements are defined. A Marketing Requirements Document (MRD) is generated, outlining market needs and product/service key features. The MRD defines the market positioning, desired features, solution performance, cost targets, and required certifications. It should also identify the prioritized stakeholder ethical value and transparency requirements.

Product & Service Ethically Aligned Life Cycle

The same way Ethical Value Requirements (EVRs), in the concept phase, are to be part of MRDs, existing processes for each phase of the product/service life cycle should be leveraged to add the ethical value dimension. If this opportunity does not exist, new processes should be defined and adapted for the type of new product/life cycle model followed, including waterfall and agile ones.

Action Principles

As noted in Stage 3, action principles are necessary for bringing the abstraction of guiding principles down to the concrete level of particular cases. When actually designing products and planning services, this is an absolute must and can make ethical decision-making much clearer. While it is impossible to have a principle that anticipates every single case, it is possible to do better and worse in terms of specificity. The practitioners themselves must be involved in the process of creating and implementing these action principles because they must be customized to the work at hand. Examples of action principles can be found in Appendix 2 and on [the Markkula Center website](#).⁴⁸

Product/Service Responsible Technology Qualification & Certification

The quality department is generally the independent function accountable for the qualification of products/services against their requirement specification. Ethical value and transparency requirements should be part of the specification, and this new dimension could be handled by technology ethics-trained quality engineers leveraging the existing qualification processes. External certification bodies will likely be established. Current quality and environmental certification processes should be leveraged to efficiently handle the new dimension.

⁴⁸ 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/>

Employee Technical Training & Certification

Employee Training Curriculum & Training Matrix

Employees participating in the product/service life cycle should receive technical training to raise their understanding and focus on meeting stakeholder ethical value requirements in their daily activities of product development, qualification, user operations and customer support. A curriculum and training matrix are necessary to plan and track employee technical skills linked to their specific duties. Training modules should be localized in different languages and consider local cultures.

Employee Responsible Technology Technical Fellow and Mentors

Employees who have demonstrated proficiency and interest in the field of technology ethics can act as mentors for their colleagues. This program should be formally established under the direction of a technology ethics fellow.

Employee Technical Onboarding

In addition to the general onboarding program, employees involved in the product/service life cycle should receive a more technology-centered ethics introduction.

Ethical Value Design & Operations Reviews

Ethical Value Design Reviews

Design reviews should include requirements reviews to ensure that all appropriate requirements and constraints have been clearly and completely identified. System design reviews during the concept, design, and development phases of the product/system life cycle are conducted.

Ethical Value Performance Measures (at every step of the enterprise value chain)

In the enterprise value chain, undertaken activities use inputs to generate immediate results called outputs. Over time, these outputs turn into outcomes. The long-term effects of these outcomes are social and environmental impacts. At every step of the value chain, Responsible Technology key performance measures that clearly represent the organization's intended business, social, and environmental outputs should be selected.

Ethical Value Operations Reviews

Operations reviews of key performance measures are critical meetings that most consistently impact the performance of the enterprise by examining the ways in which the company and its functional groups work and finding out how this can be made more efficient and profitable. This approach can also be applied to Responsible Technology goals, and formal reviews should be held quarterly, or even monthly, if targets are not being achieved.

User Ethical Use Education & Compliance

Company Policy, Usage Rules & User Agreement

Users should not adversely affect other stakeholders. They have a key role in maintaining stakeholder ethical value requirements during the use phase. The Enterprise Policy and Usage Rules should state how it will manage and control user compliance.

User Training (Curriculum, Training Modules, Localization, Certification)

Organizations should make users aware of the benefits and potential harms caused by inappropriate use of products and services. Users must understand how the enterprise ensures compliance, and how it enforces it. Organizations should develop and make available user training curricula and short training modules, as appropriate to the context of the product or service.

User Ethical Use Compliance Monitoring & Escalation

For the sake of ethical use compliance, and as appropriate to the context, organizations should develop user monitoring processes to ensure detection, validation, and escalation. The user operations function may consider acquiring AI-based tools for real-time detection.

User Notification, Remediation, Recertification

If a user, whether it is an individual user or a large business customer, violates the user agreement, they should be notified and set on a path toward remediation, whatever that might be given the context. If remediation is achieved, then the user can be recertified. If the user violation is extreme, remediation might not be possible.

Implementation Project Management

(Note: this section parallels Stage 4a)

Project Manager

“Project performance reaches its highest level when organizational influence is centered in the project manager and influence over technical details of the work is centered in the functional manager.”⁴⁹ Starting from the planning phase, this major cross-functional project should be led by an experienced project manager with a demonstrated blend of technical, administrative, and interpersonal skills. The project manager must be able to evaluate the quality of the work carried out, articulate problems, and make effective decisions for resolution.

⁴⁹ Ralph Katz and Thomas J. Allen, “Project Performance and the Locus of Influence in the R&D Matrix,” *Academy of Management Journal* Vol. 28, No. 1 (1983), available at: <https://dspace.mit.edu/bitstream/handle/1721.1/1991/SWP-1233-15506451.pdf>

Detailed Project Plan

The project manager should lead the definition of the detailed project plan, including task lists, ownership of deliverables, and due dates.

Document Repository & Revision Control

Existing document management processes and systems should be leveraged to facilitate strict document version control, routing, and review to control execution and timely issue resolution.

Project Reviews

Formal senior management reviews and regular project manager-led project status reviews should be conducted.

Employee Communication

This enterprise-wide transformation involves and will impact all employees. They should, on a regular basis, be kept informed of the progress made. Significant milestones should be celebrated.

Project Kick-Off Plan

The purpose of the kick-off plan is to get everyone on the same page, set the right tone, and establish common goals for the successful completion of the project. It should include the *who, what, where, when, why, and how* elements.

E. Stage 4b Exit Checklist

1. Are the key building blocks of the Responsible Technology Product/Service Life Cycle Management System identified, and owners named?
2. Has a project manager been appointed, and the project timeline defined with regular management reviews scheduled?
3. Are the Stakeholder Ethical Value Requirements elicitation processes defined?
4. Are the Ethically Aligned Life Cycle Processes and Action Principles defined?
5. Is the Employee Technical Curriculum and Training Matrix defined for all technical employees?
6. Are the User Ethical Use Education and Compliance policies and processes defined?
7. Are the format and calendar of the Ethical Value Design and Operations Reviews defined?
8. Are the Responsible Technology Product/Service Life Cycle Management System Performance Measures and their targets defined?
9. Is the Responsible Technology Product/Service Life Cycle Management System fully defined?
10. Is the Responsible Technology Product/Service Life Cycle Management System fully operational?

| Stage 4b Exit Checklist | | Owner | Target Date | Actual Date | Notes | Completion Status |
|-------------------------|---|---|-------------|-------------|-------|-------------------|
| 1 | The key building blocks of the Responsible Technology Product/Service Life Cycle Management System have been identified, and owners have been named | Head of Products & Services Development | | | | |
| 2 | A project manager has been appointed, the project timeline has been defined with scheduled regular management reviews | Head of Products & Services Development | | | | |
| 3 | The Stakeholder Ethical Value Requirements elicitation processes are defined | Life Cycle Project Manager | | | | |
| 4 | The Ethically Aligned Life Cycle Processes & Action Principles are defined | Life Cycle Project Manager | | | | |
| 5 | The Employee Technical Curriculum and Training Matrix is defined for all technical employees | Life Cycle Project Manager | | | | |
| 6 | The User Ethical Use Education & Compliance policies and processes are defined | Head of User Operations | | | | |
| 7 | The format and calendar of the Ethical Value Design & Operations Reviews are defined | Head of Products & Services Development | | | | |
| 8 | The Responsible Technology Product/Service Life Cycle Management System Performance Measures and their targets are defined | Head of Products & Services Development | | | | |
| 9 | The Responsible Technology Product/Service Life Cycle Management System is fully defined | Head of Products & Services Development | | | | |
| 10 | The Responsible Technology Product/Service Life Cycle Management System is fully operational | Head of Products & Services Development | | | | |

Figure 29: Stage 4b Exit Checklist

F. Resources

Ethics in Technology Practice: A Brief Guide

The [Ethics in Technology Practice](#) (ETP) resources are a set of materials designed to facilitate ethical thinking in the development of technology. Whether by simply reading the materials, having workshops, integrating the materials into existing corporate structures, or taking the materials and fashioning entirely new corporate ethics structures around them (as may be appropriate if you are reading this handbook), these materials are a versatile and practical way to implement and operationalize ethical thinking in a technology organizational context.⁵⁰

The full set of materials is freely available at the Markkula Center website under a [Creative Commons 3.0 license](#). This section will quickly review the major ETP resources and explain how they integrate with this handbook overall.

⁵⁰ Shannon Vallor, Brian Green, and Irina Raicu, “Ethics in Technology Practice,” *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/>

The [Overview of Ethics in Tech Practice](#) document briefly discusses what ethics is and is not; kinds of ethics; why technology ethics has become such a concern; and how these materials can help develop corporate ethical technology practice.⁵¹

The [Ethical Lenses](#) document is a detailed analysis of six perspectives, or lenses, for analyzing ethical issues: rights, justice/fairness, utilitarianism, common good, virtue ethics, and care ethics. Each section includes an overview of the lens and what it considers, examples of how the lens connects to technology ethics, and related questions that the lens raises when it comes to technology ethics. These lenses allow users to view an ethical problem from many perspectives, thus hopefully avoiding ethical blind spots. These lenses also directly integrate with the Markkula Center’s Framework for Ethical Decision Making, which is our next ETP resource.⁵²

The [Framework for Ethical Decision Making](#) is the Markkula Center’s Framework. It is included in the ETP materials because it forms an integral part of the ethical decision-making process, framing the entire process in a practical way.⁵³

The [Ethical Toolkit](#), along with the Framework for Ethical Decision Making and the Best Ethical Practices in Technology, forms the practical core of the ETP materials, enabling those making ethical decisions to look deeply at the ethical issues involved in the creation of technological products (although all of these tools can be useful outside of technology, too).⁵⁴

The [Case Studies](#) section consists of cases for individuals or groups who desire to practice and train their skills at ethical decision-making. The cases included here all relate to technology, and the Markkula Center website includes many more [technology and engineering ethics cases](#), as well as cases in numerous other fields such as [business ethics](#).⁵⁵

⁵¹ Shannon Vallor, Brian Green, and Irina Raicu, “Overview of Ethics in Tech Practice,” *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/overview-of-ethics-in-tech-practice/>

⁵² Shannon Vallor, Irina Raicu, Brian Green, “Technology and Engineering Practice: Ethical Lenses to Look Through,” *Markkula Center website*, July 13, 2020, available at: <https://www.scu.edu/ethics-in-technology-practice/ethical-lenses/>

⁵³ Markkula Center for Applied Ethics, “A Framework for Ethical Decision Making,” *Markkula Center website*, November 8, 2021, available at: <https://www.scu.edu/ethics/ethics-resources/a-framework-for-ethical-decision-making/>

⁵⁴ Shannon Vallor, “An Ethical Toolkit for Engineering/Design Practice,” *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/ethical-toolkit/>

⁵⁵ Irina Raicu and Brian Green, “Ethics in Technology Practice: Case Studies,” *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/case-studies/>, Clare Bartlett, Nabilah Deen, and Jocelyn Tan, “Case Studies on Engineering Ethics,” *Markkula Center website*, 2015, available at: <https://www.scu.edu/ethics/focus-areas/more-focus-areas/engineering-ethics/engineering-ethics-cases/>, and Markkula Center for Applied Ethics, “Business Ethics Cases,” *Markkula Center website*, 2022, available at: <https://www.scu.edu/ethics/focus-areas/business-ethics/resources/cases/>

The [Sample Design Workflow](#) offers one possible way to include the ethical tools in the ETP toolkit into the product design process. Customization is possible based on the particular company or group of people using the toolkit and their circumstances.⁵⁶

The [Sample Workshop Slides](#) are available to be delivered as a workshop, and the Markkula Center has done so with many organizations large and small. These sample slides illustrate what a workshop might look like, though workshops are typically customized for particular companies.⁵⁷

The [Best Ethical Practices in Technology](#) lists sixteen best practices for technology companies to follow if they really want to make ethics a central part of their corporate culture.⁵⁸ These best practices have been featured in the World Economic Forum's [Responsible Use of Technology: The Microsoft Case Study](#), where Microsoft's own practices with regard to technology ethics aligned well with these best ethical practices (pg. 16).⁵⁹

Additional Resources

Microsoft has additional resources for thinking about ethical decision-making in the context of technological product development. Three of those resources are:

Microsoft Staff, "Community Jury," *Microsoft website*, 05/06/2022, available at:

<https://docs.microsoft.com/en-us/azure/architecture/guide/responsible-innovation/community-jury/>

Microsoft Staff, "Harms Modeling," *Microsoft website*, 05/06/2022, available at:

<https://docs.microsoft.com/en-us/azure/architecture/guide/responsible-innovation/harms-modeling/> and <https://docs.microsoft.com/en-us/azure/architecture/guide/responsible-innovation/harms-modeling/type-of-harm>

Microsoft Staff, "Judgment Call," *Microsoft website*, 10/11/2022, available at:

<https://docs.microsoft.com/en-us/azure/architecture/guide/responsible-innovation/judgmentcall>

⁵⁶ Shannon Vallor, Brian Green, and Irina Raicu, "Sample Design Workflow," *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/sample-design-workflow/>

⁵⁷ Shannon Vallor, Brian Green, and Irina Raicu, "Sample Workshop Slides," *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/sample-workshop-slides/>

⁵⁸ Shannon Vallor with Brian Green, "Best Ethical Practices in Technology" in "Ethics in Technology Practice," *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/best-ethical-practices-in-technology/>

⁵⁹ WEF and Markkula Center for Applied Ethics at Santa Clara University, "Responsible Use of Technology: The Microsoft Case Study," *The World Economic Forum website*, February 2021, available at: <https://www.weforum.org/whitepapers/responsible-use-of-technology-the-microsoft-case-study>

Other resources:

Luciano Floridi and Josh Cowls, “A Unified Framework of Five Principles for AI in Society.”

Harvard Data Science Review, 1(1) 2019, available at:

<https://doi.org/10.1162/99608f92.8cd550d1>

IEEE, “Ethically Aligned Design: A Vision for Prioritizing Human Well-being with Autonomous and Intelligent Systems,” IEEE, 2019, available at:

<https://standards.ieee.org/wp-content/uploads/import/documents/other/ead1e.pdf>

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/>

IEEE, “Standard 7001-2021: IEEE Standard for Transparency of Autonomous Systems,” *IEEE*,

4 March 2022, available at: <https://standards.ieee.org/ieee/7001/6929/>

IEEE, “Standard 7010-2020: IEEE Recommended Practice for Assessing the Impact of Autonomous and Intelligent Systems on Human Well-Being,” *IEEE*, 1 May 2020, available at:

<https://standards.ieee.org/ieee/7010/7718/>

Brent Daniel Mittelstadt, Patrick Allo, Mariarosaria Taddeo, Sandra Wachter and Luciano

Floridi, “The ethics of algorithms: Mapping the debate,” *Big Data & Society*, July–December 2016: 1–21, available at:

<https://journals.sagepub.com/doi/pdf/10.1177/2053951716679679>

Stage 5: Responsible Technology Management Ongoing Operations & Continuous Improvement

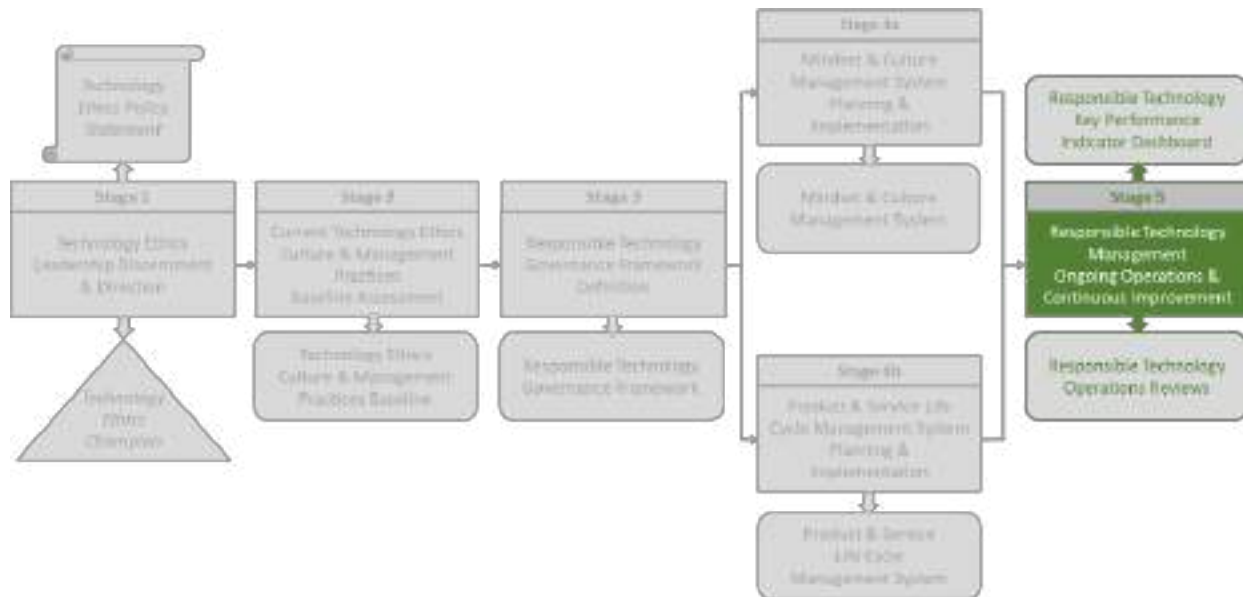


Figure 30: Operationalization Roadmap Stage 5

Ethics Is an Ongoing Process

Ethics never ends. As much as progress can be made, it can also be lost, and in the constantly evolving world of business and technology, the dynamism may seem to offer a Faustian bargain of success – but only in the short term (sometimes) and at the price of one’s ethics. The purpose of this stage is to maintain both short- and long-term success, which requires avoiding slipping into risky ethical territory or worse, as this slippage will, sooner or later, hurt the company’s reputation and bottom-line.

A. Desired Outcome

In this stage, the full Responsible Technology Management System has been implemented. The desired mindset and culture are in place and robust ethically aligned life cycle processes are delivering ethical and humane use-compliant products and services that benefit the common good of humanity and the environment.

This very important milestone should be celebrated by the organization and deserving teams/employees should be recognized and rewarded.

The focus of this stage is on performance management to ensure continuous improvement and growth. Planning and formal regular control are essential to build upon the foundations established during the enterprise responsible technology transformation.

The organization should make sure that the responsible technology performance measurements are operational at every step of the enterprise value chain, that the review process which ensures that the work is being carried out according to plan is operating, and that course corrections are applied when required. These are all discussed further in Appendix 4.

B. Ownership and Key Participants

In this stage, owned by the Technology Ethics Champion or COO, all levels of management are involved.

C. Key Deliverables

Responsible Technology Strategic and Business Plans including ESG Goals

Responsible Technology Annual Operations Plan including targets for Key Performance Measures

Responsible Technology Management System Annual Report (Culture + Life Cycle)

Responsible Technology Public Relations Plan and Calendar

Responsible Technology Annual ESG Report

D. Areas of Focus

| Stage Owner | Technology Ethics Champion/COO | | | | |
|--|---|--|---|---|--|
| Desired Outcome | Responsible Technology Certified Products & Services + Continuous Improvement | | | | |
| R-T Enterprise Planning Process | R-T Operations & ESG Reviews | R-T Performance Improvement | R-T Mindset & Culture Management System Annual Assessment | Product & Service Life Cycle Mgt System Annual Assessment | ESG Reporting & Public Relations |
| Strategic and Business Plans with ESG Goals | Responsible Technology KPM Dashboard | Performance Improvement Framework | Assessment Instrument & Calendar | Assessment Instrument & Calendar | Responsible Technology Public Relations Plan |
| Annual Operations Plan with KPMs Targets | Monthly Operations Reviews | Continuous Improvement | Assessment Report (Results, recommended corrective actions) | Assessment Report (Results, recommended corrective actions) | Responsible Technology Annual ESG Report |
| R-T Key Performance Measure Dashboard with Targets | Quarterly Executive Reviews | Responsible Technology Strategic Initiatives | Assessment Report BoD Review & Approval | Assessment Report BoD Review & Approval | |
| R-T Key Performance Measure Dashboard | Annual R-T ESG BoD Review | | Employee Communication | Employee Communication | |
| | | | | | |
| | | | | | |

Figure 31: Stage 5 Areas of Focus

Responsible Technology Enterprise Planning Process

Strategic and Business Plans with ESG Goals

Drawn from the Strategic or Growth Plan (the 5-to-10-year roadmap that will lead the enterprise to what it wants to become), the Business Plan is the 3-to-5-year roadmap that describes business success, plans for achieving and paying for this success. These plans should include social and environmental impacts, in accordance with ESG and responsible technology focus and goals.

Annual Operations Plan with KPMs Targets

The Annual Operations Plan is the translation of the Business Plan into clear goals and actions to be carried out in the current budget period by the enterprise and each of its functional groups to achieve the desired enterprise and business process performance targets. ESG and operational responsible technology performance targets should be specified in the Enterprise plans and communicated to employees.

Responsible Technology Operations & ESG Reviews

Responsible Technology Key Performance Measure Dashboard

Key performance measure targets must be recorded in the KPM dashboard. Each KPM should be recorded according to its specified measurement frequency.

Monthly Operations Reviews

Cross-functional Activity Sets owners should conduct formal monthly operational reviews to ensure the adequate execution of the annual plan and effectively control the planned performance result improvements.

Quarterly Executive Reviews

Formal Executive reviews should be conducted on a quarterly basis.

Annual Board of Directors ESG Review

As part of the annual ESG review, the Board of Directors should formally review the responsible technology governance structure and achievements.

Responsible Technology Performance Improvement

Performance Improvement Framework

Process performance improvement must be practiced by all functions. Some members may require refresher training.

Continuous Improvement

Small increases in performance results can usually be attained through continuous improvement while larger ones require process re-engineering efforts that should be defined in specific strategic initiatives.

Responsible Technology Strategic Initiatives

To achieve the targeted performance levels within the specified time horizon, you must rally your employees, formulate what needs to be done, and assign ownership for the efforts to be undertaken to carry out specific performance improvements.

Responsible Technology Mindset and Culture Management System Annual Assessment + Product/Service Life Cycle Management System Annual Assessment

The responsible technology mindset and culture management system annual assessment and product/service life cycle management system annual assessment both share the same categories, just applied to their own particular areas.

Assessment Instrument & Calendar

The process for the assessment to be carried out should be defined in a policy and a procedure including ownership, the assessment instrument (survey questionnaire, checklist, ...) to be used, the target population, and its timing.

Assessment Report (results, recommended corrective actions)

Results and recommended corrective actions should be compiled in a report that will be reviewed by executive management.

Assessment Report Board of Directors Review & Approval

Review and approval by the Board of Directors should take place before internal and external communication.

Employee Communication

The results of the annual assessment of the Responsible Technology Management System should be communicated to all employees, and successes should be celebrated.

ESG Reporting & Public Relations

Responsible Technology Public Relations Plan

The Public Relations Plan should include the activities related to the Enterprise focus on technology ethics and its achievements. This may include white papers, brochures, etc. The overall goal of these efforts should be to show the trustworthiness of the organization, not in any shallow

sense, but in the deep sense of the organization being truly devoted to ethics and responsible technology.

Responsible Technology Annual ESG Report

In addition to inclusion in the Enterprise Annual Report, the ESG portion can be used for employee retention and attracting talented candidates. Again, the organization can emphasize its efforts on ethics, responsibility, and trustworthiness.

E. Stage 5 Annual Checklist

1. Are the Responsible Technology Enterprise Planning Policies and Processes followed?
2. Are Responsible Technology Operations and ESG Reviews conducted per the defined calendar?
3. Is the Responsible Technology Performance Improvement Framework in place?
4. Is the Responsible Technology Mindset and Culture Management System assessed on an annual basis?
5. Is the Responsible Technology Product/Service Life Cycle Management System assessed on an annual basis?
6. Is the Responsible Technology Public Relations Plan defined and executed?
7. Does the Responsible Technology Annual ESG Report show continual improvement in line with the stated targets? Does it include a review of use of the Responsible Technology Governance Framework itself?
8. Are employees satisfied with the company's stand on Responsible Technology?
9. Are the company's Responsible Technology best practices published in academic and industry journals?
10. Is the company Responsible Technology focus recognized by competitors and analysts?

| Stage 5 Exit Checklist | | Owner | Target Date | Actual Date | Notes | Completion Status |
|------------------------|--|----------------------------|-------------|-------------|-------|-------------------|
| 1 | Responsible Technology Enterprise Planning Policies and Processes are followed | Technology Ethics Champion | | | | |
| 2 | Responsible Technology Operations & ESG Reviews are conducted per the defined calendar | Technology Ethics Champion | | | | |
| 3 | The Responsible Technology Performance Improvement Framework is in place | Technology Ethics Champion | | | | |
| 4 | The Responsible Technology Mindset & Culture Management System is assessed on an annual basis | Technology Ethics Champion | | | | |
| 5 | The Responsible Technology Product/Service Life Cycle Management System is assessed on an annual basis | Technology Ethics Champion | | | | |
| 6 | The Responsible Technology Public Relations Plan is defined and executed | Technology Ethics Champion | | | | |
| 7 | The Responsible Technology Annual ESG Report shows continual improvement in line with the stated targets | Technology Ethics Champion | | | | |
| 8 | Employees are satisfied with the company's stand on Responsible Technology | Technology Ethics Champion | | | | |
| 9 | The company's Responsible Technology best practices are published in academic and industry journals | Technology Ethics Champion | | | | |
| 10 | The company's Responsible Technology focus is recognized by competitors and analysts | CEO | | | | |

Figure 32: Stage 5 Annual Checklist

F. Resources

Responsible Technology Performance Measures and Control Process (see Appendix 4)
 ASQ, “Continuous Improvement Model,” *American Society for Quality website*, 2022, available at: <https://asq.org/quality-resources/continuous-improvement>

Conclusion

Every Board of Directors has a fiduciary duty to make sure that their company is seeking to improve long-term shareholder value. Ethics might seem like a luxury when confronted by this legal obligation, but it is not a luxury at all: ethics is the basis of trust, and trust is the basis for all economic activity. If boards want to support long-term sustainable shareholder value, they should also support the foundations upon which that value can exist: trust in business itself, especially their business, because it is worthy of trust, because it is ethical.

This handbook’s five stage plan is a practical way to operationalize technology ethics within an organization. But it is not easy. The details listed here 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 such as 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 this book will now have a clearer vision for how to operationalize ethics and find it easier to turn good intentions into a good reality in their organization.

There will be obstacles, but many resources are available, including the Markkula Center for Applied Ethics itself. If you found this book to be useful or if you have suggestions for improvements, please let us know; and if you want to learn more about how the Ethics Center can help you in your journey toward operationalizing ethics, please contact us through [our website](#)⁶⁰ or email: ethics@scu.edu.

⁶⁰ Markkula Center for Applied Ethics, “Contact Us,” *Markkula Center website*, 2023, available at: <https://www.scu.edu/ethics/about-the-center/contact-us/>

Appendices

Appendix 1: Examples of Technology Ethics and Responsible Technology Principles

Appendix 2: Principles for Responsible Technology for the Common Good

Appendix 3: Technology Ethics Policy Statement Example

Appendix 4: Responsible Technology Performance Measures and Control Process

Appendix 1: Examples of Technology Ethics and Responsible Technology Principles

As noted previously, there are many examples of principles in use at technology companies, as well as sources for principles from academia and elsewhere. Here are just a few sets of corporate ethics principles, as well as some ways that they are implemented at those organizations.

Microsoft’s Responsible AI Principles

To promote better outcomes for new technologies and reinforce social trust, Microsoft has developed six AI ethics principles, to guide their thinking and judgment:

Fairness: AI systems should treat all people fairly

Reliability & Safety: AI systems should perform reliably and safely

Privacy & Security: AI systems should be secure and respect privacy

Inclusiveness: AI systems should empower everyone and engage people

Transparency: AI systems should be understandable

Accountability: People should be accountable for AI systems⁶¹

Microsoft also has several associated tools for thinking about ethics during product development:

Judgment Call, the Envision AI Workshops, Impact Assessment, Community Jury, and a set of various tools for ethically improving machine learning models. More details on Microsoft’s work on responsible AI can be found in [Responsible Use of Technology: The Microsoft Case Study](#).⁶²

IBM’s Principles and Pillars

For IBM, their principles are “the guiding values that distinguish IBM’s approach to AI ethics.” There are 3 of these principles:

⁶¹ Microsoft, “Our Approach,” *Microsoft website*, 2022, available at: <https://www.microsoft.com/en-us/ai/our-approach?activetab=pivot1%3aprimar5>

⁶² WEF and Markkula Center for Applied Ethics at Santa Clara University, “Responsible Use of Technology: The Microsoft Case Study,” *The World Economic Forum website*, February 2021, available at: <https://www.weforum.org/whitepapers/responsible-use-of-technology-the-microsoft-case-study>

The purpose of AI is to augment human intelligence: At IBM, we believe AI should make all of us better at our jobs, and that the benefits of the AI era should touch the many, not just the elite few.

Data and insights belong to their creator: IBM clients' data is their data, and their insights are their insights. We believe that government data policies should be fair and equitable and prioritize openness.

Technology must be transparent and explainable: Companies must be clear about who trains their AI systems, what data was used in training and, most importantly, what went into their algorithms' recommendations.⁶³

IBM also has five Pillars that are “our foundational properties for AI ethics.” These 5 pillars are:

Explainability: Good design does not sacrifice transparency in creating a seamless experience.

Fairness: Properly calibrated, AI can assist humans in making fairer choices.

Robustness: As systems are employed to make crucial decisions, AI must be secure and robust.

Transparency: Transparency reinforces trust, and the best way to promote transparency is through disclosure.

Privacy: AI systems must prioritize and safeguard consumers' privacy and data rights.⁶⁴

IBM operationalizes their principles and pillars through several “toolkits,” which directly help AI developers make their models more explainable, fair, robust, and so on: the AI Explainability 360 toolkit, the AI Fairness 360 toolkit, the Adversarial Robustness 360 toolkit, the AI FactSheets 360 toolkit, the AI Privacy 360 toolkit, the Uncertainty Quantification 360 toolkit, and the Causal Inference 360 toolkit.⁶⁵ More details can be found in [Responsible Use of Technology: The IBM Case Study](#).⁶⁶

Salesforce's Core Values and Ethical Use Guiding Principles

Salesforce prides itself on being a company driven by values since its inception. It has core values and ethical use guiding principles. Its core values are:

⁶³ IBM, “AI Ethics,” *IBM website*, 2022, available at: <https://www.ibm.com/artificial-intelligence/ethics>

⁶⁴ Ibid.

⁶⁵ IBM, “Trusted AI,” *IBM website*, 2022, available at: <https://research.ibm.com/teams/trusted-ai>

⁶⁶ WEF and Markkula Center for Applied Ethics at Santa Clara University, “Responsible Use of Technology: The IBM Case Study,” *The World Economic Forum website*, September 2021, available at: https://www3.weforum.org/docs/WEF_Responsible_Use_of_Technology_The_IBM_Case_Study_2021.pdf

Trust: We act as trusted advisors. We earn the trust of our customers, employees, and extended family through transparency, security, compliance, privacy, and performance. And we deliver the industry’s most trusted infrastructure.

Customer Success: When our customers succeed, we succeed. So we champion them to achieve extraordinary things. We innovate and expand our business offerings to provide all our stakeholders with new avenues to achieve ever greater success.

Innovation: We innovate together. Our customers’ input helps us develop products that best serve their business needs. Providing continual technology releases and new initiatives gives our customers a competitive advantage.

Equality: Everyone deserves equal opportunities. We believe everyone should be seen, heard, valued, and empowered to succeed. Hearing diverse perspectives fuels innovation, deepens connections between people, and makes us a better company.

Sustainability: We lead boldly to address the climate emergency. We are committed to bringing the full power of Salesforce to accelerate the world’s journey to net zero.

Salesforce’s ethical use guiding principles are:

Human Rights: We work to ensure the direct use of our technologies upholds equal and inalienable protections.

Privacy: We push the frontier of privacy best practice in our product design to enable customers to protect individuals’ data.

Safety: We aim to protect humans from direct harm from the use of our technology.

Honesty: We oppose the use of our technology to knowingly spread disinformation or conspiracy theories.

Inclusion: We create opportunity through equal access to technology.⁶⁷

In order to coordinate and implement their values and guiding principles, Salesforce created an Office of Ethical and Human Use of Technology. Salesforce also incorporated these values and principles into their overall goals through their corporate strategy and accountability mechanism, the “V2MOM” – for vision, values, methods, obstacles and measures. More details on Salesforce’s work, including their product-specific guiding principles, can be found in [Responsible Use of Technology: The Salesforce Case Study](#).⁶⁸

⁶⁷ Salesforce, “Ethical Use Policy,” *Salesforce website*, 2022, available at: <https://www.salesforce.com/company/intentional-innovation/ethical-use-policy/>

⁶⁸ WEF and Markkula Center for Applied Ethics at Santa Clara University, “Responsible Use of Technology: The Salesforce Case Study,” *The World Economic Forum website*, September 2022, available at: https://www3.weforum.org/docs/WEF_Responsible_Use_of_Technology_Salesforce_Case_Study_2022.pdf

Google's Principles

Google has seven AI Principles:

- 1. Be socially beneficial.**
- 2. Avoid creating or reinforcing unfair bias.**
- 3. Be built and tested for safety.**
- 4. Be accountable to people.**
- 5. Incorporate privacy design principles.**
- 6. Uphold high standards of scientific excellence.**
- 7. Be made available for uses that accord with these principles.**

Google also has identified four AI applications it will not pursue:

- Technologies that cause or are likely to cause overall harm. Where there is a material risk of harm, we will proceed only where we believe that the benefits substantially outweigh the risks and will incorporate appropriate safety constraints.
- Weapons or other technologies whose principal purpose or implementation is to cause or directly facilitate injury to people.
- Technologies that gather or use information for surveillance violating internationally accepted norms.
- Technologies whose purpose contravenes widely accepted principles of international law and human rights.

At the end of their page, Google leaves open the chance to revise their principles as they gain more experience, saying: “As our experience in this space deepens, this list may evolve.”⁶⁹

For implementation, Google recommends certain practices for AI, saying that “Reliable, effective, user-centered AI systems should be designed following general best practices for software systems, together with practices that address considerations unique to machine learning. Our top recommendations are outlined below, with additional resources for further reading.”

Google's recommended practices include:

- Use a human-centered design approach
- Identify multiple metrics to assess training and monitoring
- When possible, directly examine your raw data
- Understand the limitations of your dataset and model
- Test, Test, Test
- Continue to monitor and update the system after deployment⁷⁰

⁶⁹ Google AI, “Artificial Intelligence at Google: Our Principles,” *Google AI website*, 2022, available at: <https://ai.google/principles/>

⁷⁰ Google AI, “Responsible AI practices,” *Google AI website*, 2022, available at: <https://ai.google/responsibilities/responsible-ai-practices/>

[Google has used Markkula Center resources](#) to shape their thinking when it comes to ethical AI, particularly the [Ethics in Technology Practice](#) materials.⁷¹

In summary, each of these companies has developed both principles to guide their choices and tools to help operationalize ethical thinking. Principles without operationalization are just nice words: the proof of ethical intentions is in the actions and outcomes themselves.

⁷¹ Kent Walker, “Google AI Principles updates, six months in,” *Google Blog*, Dec 18, 2018, available at: <https://www.blog.google/technology/ai/google-ai-principles-updates-six-months/> and Shannon Vallor, Brian Green, and Irina Raicu, “Ethics in Technology Practice,” *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/>

Appendix 2: ITEC Principles and How to Use Them: Anchoring, Guiding, Specifying, and Action

The principles described in detail here are principles that reflect the concerns of many stakeholders around the world and across time. There are many different principles, frameworks, codes, and other documents, but in our judgment, this is the most comprehensive, detailed, and relevant list for the contemporary context. It includes an anchoring principle, guiding principles, specifying principles and examples of action principles that can be developed from them. However, we also understand that organizations may wish to customize this list for their own context.

Principles for the Responsible Use of Technology

The Institute for Technology, Ethics, and Culture at the Markkula Center for Applied Ethics at Santa Clara University has an anchoring principle, a set of seven guiding principles, and forty-six specifying principles that offer a foundation for thinking ethically in technology and business. To bring these specifying principles to life, action principles will need to be developed at the most ground-level layer, to say what to do in the most particular circumstances. However, principles are always abstract at some level and need to be made concrete and operational through the rest of the processes described in this roadmap. Even then, every particular situation is different and thus requires the good judgment of engineers, managers, lawyers, and others.

While we believe that this set of principles is comprehensive, we also understand that many organizations already have their own sets of principles, and emphases are likely to vary based on the specifics of the organization. By sharing these principles, ITEC aims to provide a roadmap for companies interested in upping their ethics game, not in mandating adoption of principles and practices.

Every principle here should be taken seriously because these are widely accepted and talked about in discussions of technology ethics. Any of them can come into play in conversations on technology ethics. In other words, when talking about technology ethics, today's business leaders should be prepared to discuss these principles even if their organization has developed its own customized set of principles. It is expected that each company will adapt what is offered here in a manner consistent with its purpose and values.

The anchoring principle is the foundation for ITEC, its reason for existence. The guiding principles come forth from the anchor, and we offer specifying principles help to provide details about the meaning of the guiding principles. These specifying principles are lettered and appear

beneath each corresponding guiding principle. Near the end we give some examples of action principles, but with the understanding that this level of particularity will often vary between organizations (unless they are agreed upon industry standards, for example, like technical standards).

Anchoring Principle

Our actions are for the Common Good of Humanity and the Environment – We are committed to the responsible use of technology. We keep in mind the big picture and long term good for everyone and the environment.

To fulfill the anchoring principle's commitment to humanity and the environment, we adhere to these seven guiding principles and their specifications:

Guiding Principles and Their Specifying Principles

1. Respect for Human Dignity and Rights – For the sake of the common good, all people deserve to be respected and treated as equals because of their fundamental nature as human beings.

- A. Autonomy and self-determination – We believe in human autonomy and self-determination. Individuals should be able to lead their own lives freely and seek to become the people they desire to be.
- B. Empowerment of individuals – Individuals should be empowered by technology rather than disempowered, overwhelmed, misled, or oppressed by it.
- C. Safety, security, & reliability – Technology should be safe, secure and reliable. Technology should not intentionally or unintentionally harm people or facilitate the harming of others.
- D. Privacy and confidentiality – Technologies should protect personal data, honoring privacy and maintaining confidentiality.
- E. Participation in governance – Stakeholders should be consulted when subject to the decisions of others. Technologies are forms of power, and power can be oppressive. Technologies ought to be subject to governance that decreases the likelihood of their abuse.
- F. Right to appeal to a human – In cases where automated decision-making is used, those subject to these decisions should be able to get an explanation of the automated decision from a person.
- G. Right to an explanation – Everyone subject to decisions by automated systems or bureaucracies deserves to access an explanation in response to their inquiries.

2. Promote Human Well-Being – Respecting human dignity means helping others pursue their well-being so they may achieve their potential. The products and services we offer also follow this principle.

- A. Do good & do no harm (beneficence & non-maleficence) – We believe in providing benefit for the common good and avoiding harm.
- B. Health & well-being – We act in ways that support human health and well-being, and create products which do the same.
- C. Safe and respectful working conditions – We have safe and respectful working conditions.
- D. Access to education – Everyone deserves access to education and we will work with society to encourage and enable this access.
- E. Conflict resolution – We will support efforts to resolve conflicts from the smallest to the largest scales.
- F. Care for the vulnerable – We will prioritize care for the vulnerable because their need is most urgent.
- G. Financial Security – We will support efforts for the common good by supporting access to financial security for all people.
- H. Emotional Well-being – We will consider the emotional well-being of those we directly and indirectly affect, whether through our direct actions or our products.
- I. Purpose and Meaning – We will enable, or at least not obstruct, people in their need to seek purpose and meaning in their lives.

3. Invest in Humanity – We act in ways that invest in humanity. Respecting dignity means investing in the sorts of institutions and processes that help human well-being and the common good.

- A. Good institutions – We will build sound, trustworthy, sustainable institutions that work to protect human dignity and the common good, and protect against efforts to undermine institutions and people’s trust in them.
- B. Long-term thinking – We will engage in and support long-term thinking for creating a better world rather than short-term thinking which may lead to long-term harms.
- C. Civility & community building – We will promote civility and civil dialogue with the goal of creating stronger communities.
- D. Building good character – We will support efforts towards cultivating good individual character along with community dispositions to facilitate good character.
- E. Creating healthy, inclusive cultures – We will work towards creating healthy cultures that are supportive and inclusive of all people.

4. Promote Justice, Access, Diversity, Equity, and Inclusion – We act in ways that are just and fair. Injustice violates human dignity and the common good; therefore, we will promote justice, access, diversity, equity, and inclusion with respect to the resources necessary for human and environmental well-being and sustaining peace.

- A. Truth for the Sake of Justice – We believe in supporting truth and facts as a foundation for justice. Justice is impossible without first knowing the facts of the case.
- B. Inclusion and Non-Discrimination – We do not discriminate; we include all people and the products/services we create anticipate use by all types of people. Organizations and individuals should strive for inclusion and non-discrimination.
- C. Fair Economic Conditions – We support fair economic conditions; economic inequity should not be too extreme or it can harm the common good. Economies should serve people and not the reverse.
- D. Peace through Justice – We believe justice is the foundation of a peaceful society. Injustice damages the fabric of society by sowing distrust and enmity, while justice holds wrongdoers accountable, promotes equality and rewards those who provide benefit to society.
- E. Governance as generative dialogue – We believe that governance is a generative dialogue, where new ideas, guidelines and commitments flow from exchanges between stakeholders.
- F. Co-creation when working with the poor and marginalized – We believe in promoting the human dignity of the disadvantaged through the co-creation of value. Disadvantaged and vulnerable people deserve respect, which includes listening to their ideas for what they need rather than imposing external notions upon them.
- G. Subsidiarity – We believe in subsidiarity, which is the idea of making decisions at the governance level closest to those affected and only going to higher levels if the common good and human dignity and well-being requires it.

5. Recognize that Earth is for All Life – We share this earth with all living things. Earth’s resources exist for all. In the Earth’s biosphere all life forms are integrally connected and do best when the other life forms in the ecosystem are also flourishing – therefore we should share with other lifeforms to make sure that their needs are also provided for, both for their own sake and because our own flourishing also requires it.

- A. Environmental sustainability – We believe in using resources at a sustainable rate. Humankind often uses resources at a faster than nature can renew them, thus damaging the environment. We will act to change our behaviors and technologies so that we can live within the limits of the environment. We will promote regenerative and restorative changes to help the environment recover to the condition before humans damaged it.
- B. Biodiversity – We will work to protect biodiversity. Just as human diversity is precious, so is biological diversity. There are millions of kinds of lifeforms on Earth, in uncountable populations and individuals. This diversity helps to protect the balance of nature and prevent ecosystems from degrading.

- C. Climate action – Because climate change is already causing catastrophic damage to human civilization and the natural environment, to preserve the common good, we will take actions to stop and reverse climate change.
- D. Earth is shared by all life – Earth’s resources do not exist for the sake of exploitation by humankind. The resources, non-living and living, exist without us, in their own right and are meant to be shared. An expansive sense of the common good includes the environment.

6. Maintain Accountability – We believe in accountability for individuals and enterprises in every sector: corporations, governments, nonprofits, or community groups. Accountability means that people and organizations need to be able to give account of their actions for the sake of explanation and responsibility for successes and failures. We accept responsibility for the technology we make and ask our users to accept responsibility for how they use it. We will invest resources to secure accountability.

- A. Individuals are responsible for their actions, even those taken in organizational settings. To create safe conditions for individual responsibility, organizations should refrain from shaming people for making honest mistakes or who bring forward concerns, even if those concerns do not bear out upon investigation
- B. User accountability –Users of technology need to be accountable for the ways in which they use products and should incentivize the development and use of technology in order to facilitate the common good; product designers should be mindful of and responsive to these concerns.
- C. Corporate accountability – Decision-makers in business need to be accountable for their actions and incentivized to promote the common good. Corporate leaders should accept responsibility and remedy harms caused by the negative consequences of products and service even if these consequences were not intended.
- D. Government accountability – Decision-makers in government need to be accountable for their actions and incentivized to promote the common good. Additionally, they should promote accountability in all other sectors of society through policies, regulations, and laws.
- E. Risk disclosure – Organizations should invest resources in identifying and responding to risks, including the communication of material risks to appropriate audiences to inform stakeholder decision making.
- F. Compliance mechanisms—Means for enforcing individual and organizational compliance with regulations and standards are developed and resources are provided to support them.

7. Promote Transparency and Explainability – Accountability relies on being able to understand who and what made particular ethically significant choices and how and why those choices were made. Process – the way things are done – matters, and so the transparency and explainability of those processes matter too.

- A. Transparency & trustworthiness – We commit to transparency with an aim to be considered a trustworthy enterprise. Trust comes from trustworthiness, and trustworthiness comes from a history of making the right choices for the right reasons. Without transparency it is unclear *why* choices are made, so for the sake of trust, these processes and reasons should be made clear.
- B. Simplicity – products and services should be designed in the simplest way possible to reduce complexity, make clear the value proposition being provided to consumers, and improve sustainability for products requiring frequent updates.
- C. Fact-based decision-making – We commit to using facts. Decision making ought to be accountable to facts, not merely opinions or ideologies, and these facts should be open and explainable.
- D. Openness on process and decision-making – We believe in openness in process and decision making. Closedness and secrecy harm trust. As much as possible, decision-making ought to be open so that reasoning is visible and results are interpretable and accountable.
- E. Human oversight – We value human oversight. All machine systems ought to have humans overseeing them so that there are people to appeal to for explanations, to prevent machine systems from going astray and causing harm, and to maintain accountability.
- F. Interpretability – We believe our products/services should be interpretable and understandable as well as the decisions from any human or machine system.
- G. Reporting Status and Progress – We will report progress against a set of goals and identify the audiences they are serving in their decision making in a way that stakeholders can easily find and understand.
- H. Feedback channels for explanations – We offer feedback channels for input and to provide explanations.

Action Principles

Action principles are ones that directly help to guide those who are immediately faced with ethical decisions. They are extremely specific, in fact, so specific that they are hard to talk about in the abstract – examples are often most helpful, and some will be listed below.

Throughout the history of ethics, humans have noted that the abstract rules of ethics are constantly faced with the changing reality in which we live. Fitting the universal abstract principles of ethics to the particular concrete cases that we face can require more than just an anchoring principle, more than just guiding principles, and more than just specifying principles; they require Action Principles: principles that tell you *exactly* what to do in a given circumstance.

The only problem is that the more specific and action-oriented a principle is, the more principles you need in total. Above are listed *one* anchoring principle, *seven* guiding principles,

and *forty-six* specifying principles. This reflects a movement from the abstract and universal and towards the concrete and particular. The more specific principles become, the more of them you need to have, until it eventually becomes such a large number that it is impractical. Following the pattern, eventually you end up with an *infinite* number of ethical rules: one for every single case anyone ever has encountered, or ever will encounter. Needless to say, creating such a list is impossible (though it certainly has been tried, and analogous situations have happened in computer science during certain periods of the development of AI).

Additionally, and as noted above, the multiplication of principles can lead to more conflicts between principles, as well as potentials for misapplication. This is why good human judgment should never be removed from ethics – and it's the same reason a legal system does not consist merely of laws, but has judges and juries. Rules are always in a sense brittle, which is why people need to be there to lend flexibility and also know when it is okay to prioritize one principle over another.

Given these restrictions, then, here we will only try to give a smattering of possible action principles for technology ethics, covering an assortment of situations correlated with a few of the above guiding and specifying principles. By no means should each specifying principle be considered to have only one action principle; far from it, each will likely have numerous action principles.

1. Respect for Human Dignity and Rights...

C. Safety, security, & reliability...

- Action principle: we will store data securely, in proportion to the harm that might occur if it were to be inappropriately released.
 - For example: in W case, X security measures should be taken, and in in Y case, Z security measures should be taken.

D. Privacy and confidentiality...

- Action principle: we will not collect more data than necessary, and collected data should be stored in a manner that optimizes the protection of privacy and confidentiality.
 - For example: healthcare data should be stored in accord with relevant legal regulations, and financial data should be stored in accord with relevant legal regulations. In neither case should extraneous data be collected with the necessary data. Above and beyond the legal requirements, organizations might also consider what ethical responsibilities they have to their customers and, were it their data at stake, consider how protected they would like their data to be; and thus add an extra layer of protection in accordance with ethical notions of reciprocity.

2. Promote Human Well-Being...

A. Do good & do no harm (beneficence & non-maleficence)...

- Action principle: we will not addict or otherwise harm our users by creating overly enticing or distracting products. If a product has addictive qualities, we will determine ways to reduce the addiction or otherwise give users breaks in order to maintain their life balance, thus keeping user best interests in mind.
 - For example: the product will suggest a break or become “boring” after a certain period of time. Obviously, these specifications are only possible in the very specific circumstances of the product itself.

3. Invest in Humanity...

B. Long-term thinking...

- Action principle: we will not develop products faster than we can consider their ethical impacts and mitigate their ethical problems.
 - For example: this might include slowing the pace of development when necessary, if a product is likely to have short-term financial benefits to an organization while causing long-term harm to society. The goal here is to enhance benefits over the long term because harming society will eventually harm one’s own organization as the sociotechnical context degrades (current examples of this might include social media). To be very concrete, if a product is expected to have W effect, then X mitigation might be appropriate, while another with Y effect might need Z mitigation.

4. Promote Justice, Access, Diversity, Equity, and Inclusion...

B. Inclusion and Non-Discrimination...

- Action principle: we will examine our usage data for signs of inequitable access to our products and if/when discovered consider ways to make access more equitable.
 - For example: if certain groups of people who could benefit from a product are unable to use it, the specific causes might be investigated and remedies implemented.

5. Recognize that Earth is for All Life...

C. Climate action...

- Action principle: we will carefully monitor the organization’s energy use and determine ways to reduce that energy use. Insofar as usage cannot be reduced we will consider ways to use sustainable energy sources.
 - For example: heating and cooling systems could be set to more energy efficient thresholds, and solar panels might be installed to provide sustainable energy.

- Action principle: since business becomes more difficult in a world full of climate disasters, we will consider ways to take reasonable steps towards environmental restoration and regeneration.
 - For example: land owned by the organization might be planted with more vegetation, such as living roofs, thus partially ameliorating habitat destruction due to urban growth

6. Maintain Accountability...

F. Compliance mechanisms...

- Action principle: if regulations are violated, we will act to stop the violation and hold those responsible for it accountable, including preventing them from making similar violations in the future. The severity of reactions will be proportionate to the severity of the violations.
 - For example: while freedom of speech is highly prized, it is recognized to have limits – making threats, promoting terrorism, and certain forms of abuse are illegal in many jurisdictions, and therefore any companies that deal with the freedom of speech also need specific policies concerning their response to illegal speech.

7. Promote Transparency and Explainability...

H. Feedback channels for explanations...

- Action principle: respect for users includes giving them explanations for why and how decisions are made that concern them. We will provide a reasonable level of explanation to users if requested.
 - For example: if a loan application is denied and the applicant requests to know why they were rejected, a reasonable amount of information should be given to them to explain why this decision came about and exactly what contributed to the denial.

The above are just a tiny fraction of the action principles associated with the above guiding and specifying principles. Every organization likely already has many of these action guiding principles in use, but just does not call them by this name, calling them instead policies, regulations, rules, cultural norms, and so on. But when pursuing the creation of an ethical culture, it often makes sense to be as explicit as possible so that norms can be actively encouraged and not ignored or forgotten.

As a last point – the above principles, at all levels, can come into tension and even conflict with one another. Privacy and safety can conflict. Privacy and transparency can conflict. Autonomy can conflict with many (if not all) of the above principles, including itself. Because there are multiple goods to pursue in life, no single rule can account for everything, and as long as there is more than one rule, then conflict becomes inevitable. Therefore, none of these principles

can be absolute; all must be applied with prudential judgment and care. This does not mean that the principles are weak or should be broken without cause, far from it. What it means is that under certain circumstances some of these principles might need to take second place to others of these principles in order to best protect the common good of all people and the environment.

Committing to these principles by using them in enterprise decision making will change the culture of business writ large and small. At industry and sector levels, work is underway to define standards and develop regulatory means to capture ESG goals and performance of companies.

This Appendix on principles can also be found on [the Markkula Center website](#).⁷²

⁷² ITEC, “ITEC Principles and How to Use Them: Anchoring, Guiding, Specifying, and Action,” *Markkula Center website*, March 2023, available at: <https://www.scu.edu/institute-for-technology-ethics-and-culture/itec-principles/>

Appendix 3: Technology Ethics Policy Statement

Example

This short appendix provides an example of a policy statement that can be used to develop your own enterprise-specific public commitment to responsible technology.

We are committed to protect and guarantee the fundamental condition of freedom and dignity defined in the UN Universal Declaration of Human Rights and to safeguard the rights and freedom of individuals so that they are not discriminated against by advanced technologies due to their race, color, sex, language, religion, political or other opinion, national or social origin, property, birth, or other status.

We want all our actions to be for the common good of humanity and the environment, and our enterprise culture to be one in which everyone feels ownership for thinking through the consequences of the technology and accountability for its impacts on humanity and the planet.

Emphasizing accountability, transparency, and explainability, we strive to ensure that our products and services, throughout their entire life cycle, focus on the ethical values of all stakeholders and increase human flourishing, including that of future generations, and the promotion of healthy and sustainable life on this planet.

Appendix 4: Responsible Technology

Performance Measures and Control Process

This appendix focuses on the Responsible Technology performance measurements needed at every step of the enterprise value chain and the recommended review process to ensure that the work defined is being carried out according to plan and course corrections are applied when required.

Control

The five basic management functions are planning, decision-making, organizing, leading, and controlling.⁷³

At the Enterprise level, *controlling* is about measuring performance, ensuring that the work defined in the Annual Operations Plan is being carried out according to plan, and modifying the plan when required.

Performance Measures

A fundamental principle of management is that you cannot improve performance if you do not measure it. To ensure success, enterprises must thus measure performance results.

*“Performance measures are quantifications of evidence of performance result. They are comparisons that provide objective evidence of the degree to which a performance result is occurring over time.”*⁷⁴ Milestones are not measures. They are part of project management, not performance management.

Performance measures show how strategy execution and achievement are tracked.

To improve performance across your enterprise, you must understand how each part of the organization is helping you deliver the products and services that will lead to the social and environmental change you are pursuing.

Performance Measure Targets & Strategic Initiatives

Once the right Responsible Technology performance measures and measurement frequencies are selected, you must specify the level of performance you want to achieve within a given time horizon. The size of the gap between your current performance level and your stated target

⁷³ Robert Anthony, *Planning and Control Systems: A Framework for Analysis*. Division of Research, Graduate School of Business Administration, Harvard University, Boston. 1965.

⁷⁴ Stacey Barr, *Practical Performance Measurement: Using the PuMP Blueprint for Fast, Easy and Engaging KPIs*, The PuMP Press, 2014.

represents the magnitude of the process improvement you need to deliver. While small gaps can be addressed through ongoing process improvements, larger ones will require specific actions, outside day-to-day operational activities, called strategic initiatives.⁷⁵

Operations Reviews

Executive-level Operations Reviews of performance measures are critical meetings that most consistently impact the performance of your enterprise by examining the way in which the company and its functional groups work and how this can be made more efficient and profitable. This approach can also be applied to your Responsible Technology goals.

From Theory of Change to Key Performance Measures

1. Logic Model

To achieve your desired business outcomes and the social and environmental impacts defined in your ESG goals, your company needs to use resources and carry out activities to deliver products and services that, over time, will transform the lives of your customers and beneficiaries.

This enterprise *value chain*⁷⁶ can be described by a *theory of change*⁷⁷, a narrative that explains the links between program strategies or activities and outcomes, and how and why the desired change is expected to come about. The theory of change narrative can be represented graphically by a *logic model*.

From the logic model you can identify the processes or cross-functional activities leading to your expected social and environmental impacts and select the relevant key performance measures.

Social & Environmental Impact Logic Model Elements

Undertaken *activities* use *inputs* to generate immediate results called *outputs*. Over time, these outputs turn into *outcomes*. The long-term effects of these outcomes are *social and environmental impacts*.

⁷⁵ Robert S. Kaplan and David P. Norton, *The Execution Premium: Linking Strategy to Operations for Competitive Advantage*, Harvard Business Review Press, 2008.

⁷⁶ Michael E. Porter, *Competitive Advantage: Creating and Sustaining Superior Performance*, New York: The Free Press, 1985.

⁷⁷ W.K. Kellogg Foundation, *W.K. Kellogg Foundation Logic Model Development Guide*, W.K. Kellogg Foundation website, 2004. <https://wkkf.issuelab.org/resource/logic-model-development-guide.html> and W.K. Kellogg Foundation, *W.K. Kellogg Foundation Evaluation Handbook*, Better Evaluation website, 2004, <https://www.betterevaluation.org/sites/default/files/2022-07/EvaluationHandbook.pdf>

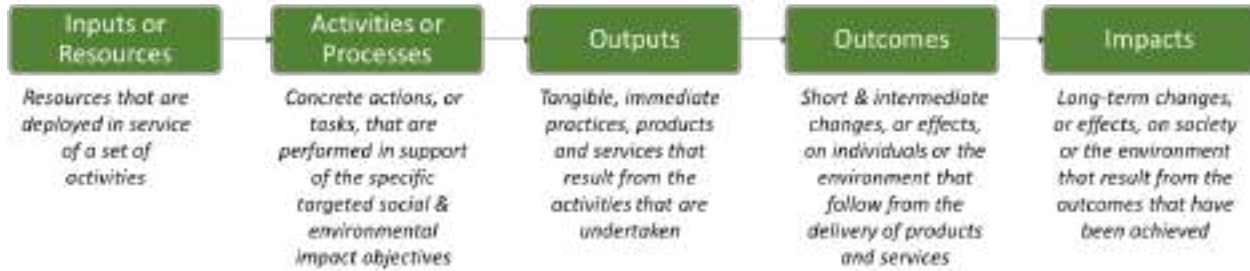


Figure 33: Path to Impact

2. Responsible Technology Theory of Change Narrative

To deliver "ethical and humane use principles" compliant products and services that benefit the common good of humanity and the environment, organizations must:

- ***Know the ethical requirements of their customers and internal and external stakeholders***
- ***Transform their enterprise mindset and culture to one in which everyone feels ownership for thinking through the consequences of the technology and accountability for its impact on humanity, and***
- ***Operationalize their Responsible Technology Governance Framework by implementing a Responsible Technology Management System that focuses on meeting customer requirements and stakeholder ethical values throughout the entire life cycle of the products and services they offer.***

3. Cross-functional Activity Sets

A desired single output or set of outputs is often the result of several departments working together in an informal matrix organization structure of multiple functional stakeholders with different roles and responsibilities. To achieve optimum performance of the cross-functional activities, the owner of each group of activities must be clearly identified as being the one accountable for meeting an agreed set of common performance measures and targets. Product and service development is an example of the cooperative work of multiple departments such as marketing, product management, product design, product development, quality assurance, user operations, and others.

Cross-functional activity grouping is a useful technique that brings ownership and common focus, as well as facilitates, to managing the performance of these activities.

Cross-functional Activity Set Ownership – R.A.C.I. Model

Who owns the grouping of cross-functional activities? Who is accountable for its performance results? The person with the most ownership is usually the one who has control over the people and systems resources, a good understanding of the overall process, the ability to effect change,

the power to act, and is accountable to his/her supervisor for achieving the expected performance results.

The **R.A.C.I. Model** is a role and responsibility chart that assigns roles and responsibilities for any activity or group of activities. It helps in the understanding of the various roles and responsibilities played by each function involved.

R stands for *Responsible* = the person performing the work. In a cross-functional activity set, several people from different functional departments will perform the work, so several Rs will appear in the chart.

A is for *Accountable* = the person ultimately answerable for the completion of the work or decisions being made. Only one person can be accountable for results. A single A will be present in the chart.

C represents *Consulted* = anyone who must be consulted prior to a decision being made and/or a task being completed. There can be several Cs in an activity set.

I is for *Informed* = anyone who must be informed when a decision is made or work is completed.

A simple table can be used to show the names, definition, their roles, and the responsibilities of the departments involved in each cross-functional activity set (CFAS).

Responsible Technology Cross-Functional Activity Sets

The responsible technology activities undertaken by the organization to meet customer requirements and direct and indirect stakeholder ethical values throughout the entire life cycle of the products and services they offer can be grouped into three key cross-functional activity sets:

Responsible Technology Employee Development and Empowerment

Responsible Technology User Engagement

Stakeholder Ethical Value Life Cycle Alignment

Human resources, user operations, and product/service development are the respective lead functions accountable for the performance.

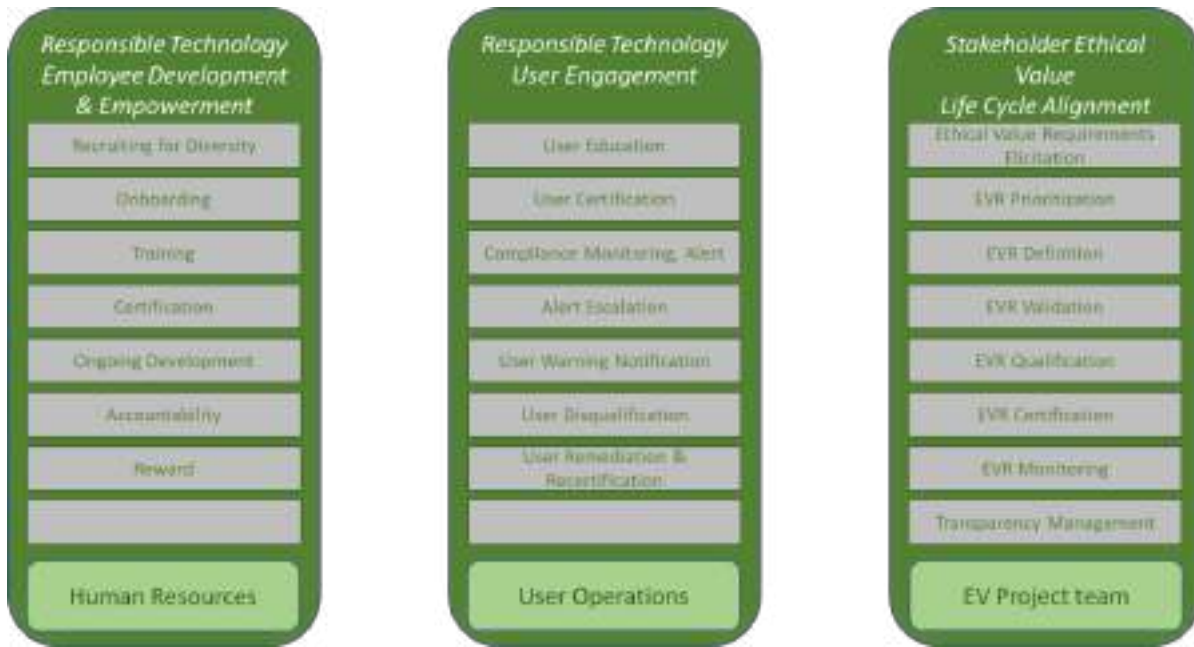


Figure 34: Responsible Technology Cross-Functional Activity Sets Example

Performance Management Levels

One of the reasons managers struggle with too many performance measures is that they do not recognize the need for performance management to be carried out at the right organizational level.

The granular input/resource, activity/process and output performance measures required for functional department management belong to the bottom Enterprise functional/department performance management level. The middle enterprise cross-functional level is where functional silos collaborate to deliver the intended results of their multi-department activities. The top Enterprise Performance Management level is where the CEO and executive staff focus on the few key enterprise output measures that, over time, lead to their desired outcomes and impacts.

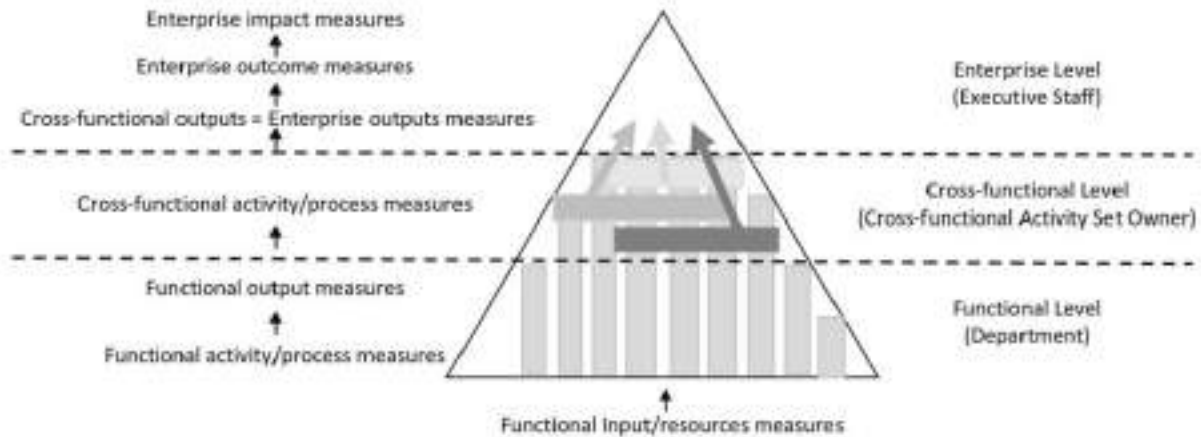


Figure 35: Performance Management Levels

Key Performance Measures (KPMs)

The challenge is to identify the few best performance measures that provide quantifiable evidence of performance results for the key cross-functional processes at each step of the enterprise value chain. Separate the “**vital few**” key performance measures from the “**trivial many**” that people may bring to the table. Keep in mind that if too many things are measured, the organization is not focused and nothing is managed!

Since KPMs are measures by which an enterprise evaluates whether its actual performance is in line with defined strategic business goals, they should provide a consistent method of tracking the organization’s goals and performance targets. To select the right measures and make sure they are easily tracked, quantified, and tied to the organization’s business, social and environmental impact targets, follow the proven S.M.A.R.T. methodology below.

S.M.A.R.T. Performance Measures

"Ideally speaking, each corporate, department, and section objective should be Specific, Measurable, Assignable, Realistic, and Time-based."⁷⁸

Specific: it must target a specific area for improvement

Measurable: it must quantify a measure of progress

Assignable: who is accountable for it can be identified

Realistic: the results can realistically be achieved, given available resources

Time-related: its time horizon for achieving the result is defined

⁷⁸ George T. Doran, “There’s a S.M.A.R.T. way to write management’s goals and objectives,” *Management Review* 70, no. 11 (November 1981): 35–36.

4. Selecting Enterprise-level Responsible Technology Performance Measures

The selection of the enterprise’s responsible technology key performance measures should be led by the appropriate management level. The discussion regarding the impact and outcome categories should be led by the CEO. The output, activity, and input KPMs should be defined by each cross-functional activity set owner.

For each enterprise-level KPM, answer the following five questions:

- a. Does this KPM clearly represent our intended business, social and environmental outputs?
- b. Does this KPM align performance improvement efforts around commonly shared strategic goals and objectives?
- c. Will focusing on this KPM improve organizational performance?
- d. Is this KPM relatable at all levels of the organization? Can employees have an impact on this measure?
- e. Does this KPM meet the SMART rules?

For each *activity or cross-functional set*, identify a single or maximum 2 KPMs that clearly represent the activities carried out to deliver the desired outputs.

Answer the five questions listed under *Outputs*.

Here are examples illustrating the activity, output, outcome, and impact key performance measure selection process at the activity set and enterprise levels.



Figure 36: Human Resources Responsible Technology KPM Examples



Figure 37: User Operations Responsible Technology KPM Examples



Figure 38: Product/Service Development Responsible Technology KPM Example

Enterprise-level Responsible Technology Impact Performance Measures

At the enterprise level, the CEO is accountable for all enterprise activities, and their authority is delegated to all activity set owners to deliver their respective expected performance results. The CEO is the owner of the impact performance measures.

| Cross-functional Activities | Key Performance Measures (KPMs) | | | |
|---|---------------------------------|------------------------|---|--------|
| Responsible Technology Employee Development & Empowerment | Activity | Output | Outcome | Impact |
| | HR R-T Cost | Diversity Ratio | Employee Satisfaction | |
| | Employee R-T Turnover | | | |
| Responsible Technology User Engagement | Activity | Output | Outcome | |
| | Non-compliance Alerts | Compliance Escapes | User Satisfaction | |
| | Users Banned | | | |
| Stakeholder Ethical Value Life Cycle Alignment | Activity | Output | Outcome | |
| | Direct Stakeholders Engaged | R-T Certified Products | Stakeholder Satisfaction | |
| | Indirect Stakeholders Engaged | R-T Certified Services | Inclusive/Equitable Growth | |
| | | | Stakeholder Individual Well-Being | |
| | | | Stakeholder Collective Well-Being | |
| | | | Healthy Sustainable Natural Environment | |

Figure 39: Enterprise-level Responsible Technology KPM Example

Enterprise Responsible Technology Key Performance Measure Definition

For each Responsible Technology Key Performance Measure selected, the following six questions should be answered:

1. Are we currently measuring all the KPMs we have selected?
2. How often does the data need to be reported?
3. How are we expressing the performance of each KPM?
4. Where does the data come from?
5. What does each KPM mean?
6. What is the current level of performance?
7. What is our target performance level, 36 months out?

5. Responsible Technology Performance Measure Dashboard

Historical and current performance results should always be shown against the target that was defined for that KPM. This information is compiled in a singular tabular format.

| Core-functional Activity Set (CFAS) | CFAS Owner | KPM Category | CFAS Key Output Performance Measures | Currently Measured? Y/N | Expected Start Date | Measurement Frequency D/M/YM/Q/S/A | UOM | Prior Q4 Target | Prior Q4 Actual | Q1 Target | Q1 Actual | Q2 Target | Q2 Actual | Q3 Target | Q3 Actual | Q4 Target | Q4 Actual | |
|---|--------------------------|--------------|---|-------------------------|---------------------|------------------------------------|-------|-----------------|-----------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--|
| Responsible Technology Employee Development & Empowerment | Human Resources Director | Output | Diversity Ratio | Y | | Q | # | | | | | | | | | | | |
| | | Outcome | Employee Satisfaction | N | ? | A | % | | | | | | | | | | | |
| Responsible Technology User Engagement | User Support Director | Output | Non-Compliance Escapes | Y | | Q | # | | | | | | | | | | | |
| | | Outcome | User Satisfaction | N | ? | A | % | | | | | | | | | | | |
| Stakeholder Ethical Value Life Cycle Alignment | EV Project Team Director | Output | R-T Certified Products | Y | | Q | # | | | | | | | | | | | |
| | | | R-T Certified Services | Y | | Q | # | | | | | | | | | | | |
| | | Outcome | Stakeholder Satisfaction | Y | | A | % | | | | | | | | | | | |
| | | | Inclusive & Sustainable Growth | Y | | A | Index | | | | | | | | | | | |
| Responsible Technology Impact | CEO | Impact | Stakeholder Individual Well-being | Y | | A | Index | | | | | | | | | | | |
| | | | Stakeholder Collective Well-being | Y | | A | Index | | | | | | | | | | | |
| | | | Healthy Sustainable Natural Environment | Y | | A | Index | | | | | | | | | | | |

Figure 40: Key Performance Measure Dashboard Example

6. Strategic Initiatives

To achieve your targeted performance levels within your specified time horizon, focus the team and be open to the need to rethink the approach. Rally employees, formulate what needs to be done differently, and assign ownership for the efforts to be undertaken to carry out these important strategic initiatives.

Strategic Initiatives (S.I.s) are “Collections of finite-duration discretionary projects and programs, outside of the organization's day-to-day operational activities, that are designed to help the organization achieve its targeted performance.”⁷⁹

Identify the owner of each S.I. Some strategic initiatives will likely include multiple key initiatives such as documenting the current process, re-engineering one or more single-function processes, verifying that the re-engineering process meets the specified requirements, etc. Each

⁷⁹ Robert S. Kaplan and David P. Norton, *The Execution Premium: Linking Strategy to Operations for Competitive Advantage*, Boston, MA: Harvard Business Review Press, 2008, pg. 103.

key initiative is a sub-project managed by an owner using specific human resources and requiring funding. These S.I.s require careful planning and execution control.

7. Monthly and Quarterly Enterprise-level Responsible Technology Operations Reviews

The purpose of the executive-level Responsible Technology Operations Reviews is to improve the performance of the enterprise and its departments, keep the team focused on priorities, track progress, and identify when recovery plans are necessary.

The approach is quite simple: to find out what is working, uncover what is not working, and correct course for better results.

Schedule formal Operations Reviews monthly or quarterly, depending on the rate of change and your level of success for achieving the desired targets. They should be held monthly if the business is changing rapidly, or perhaps even more frequently if teams have difficulties meeting their monthly performance targets.

Operations Reviews and their focus on continuous learning and improvement in relation to the overarching Responsible Technology goals of the enterprise are a tremendous developmental tool for all participating employees. They give employees the opportunity to see real leadership, *your company's leadership*, in action and learn how to react to performance results that do not meet expectations. This is how they acquire the management reflexes you want them to develop.

Operations Reviews are action-oriented meetings. The presenters should be prepared to adequately answer questions like:

- *What did you say you would do in the period we are reviewing?*
- *What actually happened?*
- *Did you fall short? Meet target? Exceed target?*
- *What worked? Why?*
- *What did not work? Why?*
- *What did you learn?*
- *What are you going to do moving forward as a result?*

Keep in mind that the purpose of Operations Reviews is not to find someone to blame, but to identify root causes and define the best way to get back on track when facing obstacles or delays. It is also to add to the collective understanding of what is working well and why.

Operations Review Format

The COO or their designee chairs the quarterly/monthly meeting that consists of three parts:

Key strategic initiative status

Key performance measure results

Action item tracking

The selected member of the management staff responsible for recording the action items raised during the Operations Reviews should be clearly identified before the meeting starts.

Key Strategic Initiative Status Review

When reporting the status of a S.I., do so against the timeline defined when the strategic initiative was defined. Everything presented must not only show the status but also the target. So, milestone status and plan timeline should be shown together. A strategic initiative tracking template can be developed for reviewing progress.

Select one or two key S.I.s to review.

Invite each S.I. owner to present the status of his/her strategic initiative.

It is assumed that the definition and the desired results of each S.I., the key tactics and their scheduled start and end dates were approved during the enterprise planning process.

The presenter should therefore focus on reporting the S.I. execution status, highlighting missed dates, the reason(s) for the miss, and the actions put in place to get back on track.

The person chairing the meeting will most probably ask:

How long will it take to get back on the original schedule?

If the answer is “I am not sure,” expect the next questions to be:

Why?

How can the delay be eliminated or reduced?

Key Performance Measures Status Review

The Responsible Technology Output KPM Dashboard showing historical and current performance results should be used.

Most of the discussion will typically revolve around each serious target missed. The last three-month trend will reveal if a given performance value is a recent miss or the continuation of previously reported below-target performances.

These concerning or even alarming performance measures will be subject to questions like:

- *Do you know what is happening here?*
- *Is this an expected seasonal trend for which a different trend timeline is needed?*
- *Is this just a temporary glitch?*
- *Do you know the root cause?*
- *What are you doing to get back on track?*
- *When will you know that this fix works?*
- *When will the target be achieved?*

If the performance results of a Cross-functional Activity Set are consistently below target, the COO or his/her designee will ask to sit in the CFAS owner's operations review to ensure that the CFAS team is tracking *activity* level measures and focusing on drivers.

Operations Review Action Item Tracking Status

Open action items from prior meetings should be reviewed to ascertain if the resolutions are on track for meeting their scheduled target closure date. Focus must be put on those categorized as critical. If any of those are not on track to be resolved, a special meeting should be called to ensure that all stakeholders are working with the action item owner to promptly resolve the issue.

An updated version of the template, including the new action items raised during the just-conducted Operations Review should be distributed to all participants soon after.

CFAS Activity Set Owner Responsible Technology “Output” Performance Measure Reviews

Ahead of the Executive Operations Reviews, Cross-functional Activity Set owners and key stakeholders should conduct internal reviews of the activity set *output* performance measure as well as their *activity* and *input* measures. This will ensure that they understand their numbers, what is behind them, and are fully prepared to answer the questions executives will ask.

Responsible Technology Annual Outcome & Impact KPM Reviews

Since *outcome* and *impact* performance measures are the long-range results of the Enterprise *outputs*, it makes sense to review them on an annual basis. The KPM dashboard shown should be used for the review of these key performance measures.

The CEO should lead these annual reviews of *outcomes* and *impacts* performance measures. These reviews should follow the approach and format used in the monthly output performance measures reviews.

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Works Cited

- Anthony, Robert. *Planning and Control Systems: A Framework for Analysis*. Division of Research, Graduate School of Business Administration, Harvard University, Boston. 1965.
- ASQ. “Continuous Improvement Model.” *American Society for Quality website*, 2022, available at: <https://asq.org/quality-resources/continuous-improvement>
- Associated Press. “Police: Babies starved while parents gamed.” *NBC News*, July 14, 2007, available at: <https://www.nbcnews.com/id/wbna19766590>
- Barr, Stacey. *Practical Performance Measurement: Using the PuMP Blueprint for Fast, Easy and Engaging KPIs*. The PuMP Press, 2014.
- Bartlett, Clare, Nabilah Deen, and Jocelyn Tan. “Case Studies on Engineering Ethics.” *Markkula Center website*, 2015, available at: <https://www.scu.edu/ethics/focus-areas/more-focus-areas/engineering-ethics/engineering-ethics-cases/>
- Campbell, Charlie. “Gamer Dad Arrested After Toddler Dies of Neglect.” *Time*, April 15, 2014, available at: <https://time.com/63033/south-korea-gaming-toddler-death/>
- Doran, George T. “There's a S.M.A.R.T. way to write management's goals and objectives.” *Management Review* 70, no. 11 (November 1981): 35–36.
- Ethics Ops. “Rights Test.” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/rights-test>
- Ethics Ops. “Choices Test.” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/choices-test>
- Ethics Ops. “Justice Test.” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/justice-test>
- Ethics Ops. “Best Outcomes Test.” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/best-outcomes-test>
- Ethics Ops. “Common Good Test.” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/common-good>
- Ethics Ops. “Character / Virtue Test.” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/character-test>
- Ethics Ops. “Compare Test Conclusions.” *Ethics Ops website*, 2016, available at: <https://www.ethicsops.com/compare-test-conclusions>
- Farberov, Snejana. “Parents 'were so immersed in fantasy video game world where their avatars married and had jobs they let real-life daughter, 2, nearly starve to death'.” *The Daily Mail*, 11 October 2013, available at: <https://www.dailymail.co.uk/news/article-2455567/Parents-immersed-video-game-daughter-nearly-starved-death.html>
- Floridi, Luciano, and Josh Cowls. “A Unified Framework of Five Principles for AI in Society.” *Harvard Data Science Review*, 1(1) 2019, available at: <https://doi.org/10.1162/99608f92.8cd550d1>

- Google AI. "Artificial Intelligence at Google: Our Principles." *Google AI website*, 2022, available at: <https://ai.google/principles/>
- Google AI. "Responsible AI practices." *Google AI website*, 2022, available at: <https://ai.google/responsibilities/responsible-ai-practices/>
- IBM. "AI Ethics." *IBM website*, 2022, available at: <https://www.ibm.com/artificial-intelligence/ethics>
- IBM. "Trusted AI." *IBM website*, 2022, available at: <https://research.ibm.com/teams/trusted-ai>
- IEEE. "Ethically Aligned Design: A Vision for Prioritizing Human Well-being with Autonomous and Intelligent Systems." IEEE, 2019, available at: <https://standards.ieee.org/wp-content/uploads/import/documents/other/ead1e.pdf>
- IEEE. "Standard 7010-2020: IEEE Recommended Practice for Assessing the Impact of Autonomous and Intelligent Systems on Human Well-Being." *IEEE*, 1 May 2020, available at: <https://standards.ieee.org/ieee/7010/7718/>
- 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/>
- IEEE. "Standard 7001-2021: IEEE Standard for Transparency of Autonomous Systems." *IEEE*, 4 March 2022, available at: <https://standards.ieee.org/ieee/7001/6929/>
- 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/>
- Kaplan, Robert S., and David P. Norton. *The Execution Premium: Linking Strategy to Operations for Competitive Advantage*. Boston, MA: Harvard Business Review Press, 2008.
- Katz, Ralph, and Thomas J. Allen. "Project Performance and the Locus of Influence in the R&D Matrix." *Academy of Management Journal* Vol. 28, No. 1 (1983), available at: <https://dspace.mit.edu/bitstream/handle/1721.1/1991/SWP-1233-15506451.pdf>
- Keenan, James F. "7 lessons learned from the Vatican's artificial intelligence symposium." *National Catholic Reporter*, Nov 2, 2021, available at: <https://www.ncronline.org/news/opinion/7-lessons-learned-vaticans-artificial-intelligence-symposium>
- KPMG. "An Ethical Compass in the Automation Age: Decisions require deep dive into company core values." *KPMG.com*, 2017, available at: <https://advisory.kpmg.us/content/dam/advisory/en/pdfs/an-ethical-compass-in-the-automation-age.pdf>
- KPMG International. "The Shape of AI Governance to Come: A guide to creating policies, governance and oversight of AI technology." *KPMG website*, 2021, available at: <https://assets.kpmg/content/dam/kpmg/xx/pdf/2021/01/the-shape-of-ai-governance-to-come.pdf>

Kwan, Jonathan. "Care Ethics." *Markkula Center website*, May 5, 2023, available at <https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/care-ethics/care-ethics.html>

Markkula Center for Applied Ethics. "Calculating Consequences: The Utilitarian Approach to Ethics." *Markkula Center website*, August 1, 2014, available at: <https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/calculating-consequences-the-utilitarian-approach/>

Markkula Center for Applied Ethics. "Sample Question Sets." *Markkula Center website*, Jun 19, 2019, available at: <https://www.scu.edu/ethics/culture-assessment-practice/sample-question-sets/>

Markkula Center for Applied Ethics. "A Framework for Ethical Decision Making." *Markkula Center website*, November 8, 2021, available at: <https://www.scu.edu/ethics/ethics-resources/a-framework-for-ethical-decision-making/>

Markkula Center for Applied Ethics. "Business Ethics Cases." *Markkula Center website*, 2022, available at: <https://www.scu.edu/ethics/focus-areas/business-ethics/resources/cases/>

Markkula Center for Applied Ethics. "Culture Self-Assessment Practice." *Markkula Center website*, 2022, available at: <https://www.scu.edu/ethics/culture-assessment-practice/>

Markkula Center for Applied Ethics. "Resources for Leaders Managing Corporate Culture." *Markkula Center website*, 2022, available at: <https://www.scu.edu/leadership-ethics/resources/resources-for-leaders-managing-corporate-culture/>

Markkula Center for Applied Ethics. "An Industry Leader in Ethics Consultations." *Markkula Center website*, 2023, available at: <https://www.scu.edu/ethics/about-the-center/ethics/consulting-services/>

Markkula Center for Applied Ethics. "Contact Us." *Markkula Center website*, 2023, available at: <https://www.scu.edu/ethics/about-the-center/contact-us/>

Markkula Center for Applied Ethics. "Resources on Culture." *Markkula Center website*, 2023, available at: <https://www.scu.edu/ethics/culture-assessment-practice/resources-on-culture/>

Martínez, Cecilia, Ann Gregg Skeet, and Pedro M. Sasia. "Managing organizational ethics: How ethics becomes pervasive within organizations." *Business Horizons* 64, Iss. 1 (January–February 2021) pages 83-92, available at: <https://www.sciencedirect.com/science/article/pii/S0007681320301233>

Microsoft Staff. "Our Approach." *Microsoft website*, 2022, available at: <https://www.microsoft.com/en-us/ai/our-approach?activetab=pivot1%3aprimar5>

Microsoft Staff. "Community Jury." *Microsoft website*, 05/06/2022, available at: <https://docs.microsoft.com/en-us/azure/architecture/guide/responsible-innovation/community-jury/>

Microsoft Staff. "Harms Modeling." *Microsoft website*, 05/06/2022, available at: <https://docs.microsoft.com/en-us/azure/architecture/guide/responsible-innovation/harms-modeling/> and <https://docs.microsoft.com/en-us/azure/architecture/guide/responsible-innovation/harms-modeling/type-of-harm>

- Microsoft Staff. "Judgment Call." *Microsoft website*, 10/11/2022, available at: <https://docs.microsoft.com/en-us/azure/architecture/guide/responsible-innovation/judgmentcall>
- Mittelstadt, Brent Daniel, Patrick Allo, Mariarosaria Taddeo, Sandra Wachter and Luciano Floridi. "The ethics of algorithms: Mapping the debate." *Big Data & Society*, July–December 2016: 1–21, available at: <https://journals.sagepub.com/doi/pdf/10.1177/2053951716679679>
- Olson, Steven D. "Shaping an Ethical Workplace Culture." *SHRM Foundation website*, 2013, available at: <https://www.shrm.org/hr-today/trends-and-forecasting/special-reports-and-expert-views/Documents/Ethical-Workplace-Culture.pdf>
- PAI Staff. "Framework for Promoting Workforce Well-being in the AI-Integrated Workplace." *Partnership on AI website*, August 27, 2020, available at: <https://partnershiponai.org/paper/workforce-wellbeing/>
- Phillips, Katherine W., and Denise Lewin Loyd. "When Surface and Deep-Level Diversity Collide: The Effects on Dissenting Group Members," *Organizational Behavior and Human Decision Processes*, vol. 99, issue 2, March 2006, pp. 143–160, available at: <https://www.sciencedirect.com/science/article/abs/pii/S0749597805001524>
- Porter, Michael E. *Competitive Advantage: Creating and Sustaining Superior Performance*. New York: The Free Press, 1985.
- Radclyffe, Charles, and Richard Nodell. "Ethical by Design: Measuring and Managing Digital Ethics in the Enterprise." *SocArXiv Papers*, January 2020, available at: <https://osf.io/preprints/socarxiv/gj2kf/>
- Raicu, Irina, and Brian Green. "Ethics in Technology Practice: Case Studies." *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/case-studies/>
- Salesforce. "Ethical Use Policy." *Salesforce website*, 2022, available at: <https://www.salesforce.com/company/intentional-innovation/ethical-use-policy/>
- Salmon, Andrew. "Couple: Internet gaming addiction led to baby's death." *CNN*, April 2, 2010, available at: <http://www.cnn.com/2010/WORLD/asiapcf/04/01/korea.parents.starved.baby/index.html>,
- Skeet, Ann Gregg. "The Practice of Ethical Leadership." *Markkula Center website*, April 12, 2017, available at: <https://www.scu.edu/ethics/leadership-ethics-blog/practice-of-ethical-leadership/>
- Skeet, Ann Gregg. "Culture Assessment: A Learning Process (PowerPoint slides)." *Markkula Center website*, 2019, available at: <https://www.scu.edu/ethics/culture-assessment-practice/culture-self-assessment-a-learning-process/>
- Skeet, Ann Gregg. "The Markkula Center's Experience with Culture Self-Assessment (Seagate: A Case Study in Culture Assessment)." *Markkula Center website*, March 20, 2019, available at: <https://www.scu.edu/ethics/culture-assessment-practice/the-markkula-centers-experience-with-culture-assessment/>

- Skeet, Ann Gregg. "A Discussion with Seagate's Lead Independent Director." *Markkula Center website*, May 21, 2019, available at: <https://www.scu.edu/ethics/culture-assessment-practice/a-discussion-with-seagates-lead-independent-director/>
- Skeet, Ann Gregg. "How to Do a Culture Self-Assessment." *Markkula Center website*, Jun 19, 2019, available at: <https://www.scu.edu/ethics/culture-assessment-practice/culture-self-assessment-practice-process-design/>
- Skeet, Ann Gregg. "Defining Healthy Organizational Culture." *Markkula Center website*, December 2020, available at: <https://www.scu.edu/ethics/culture-assessment-practice/defining-healthy-organizational-culture/>
- Vallor, Shannon. "An Ethical Toolkit for Engineering/Design Practice." *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/ethical-toolkit/>
- Vallor, Shannon, with Brian Green. "Best Ethical Practices in Technology" in "Ethics in Technology Practice." *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/best-ethical-practices-in-technology/>
- Vallor, Shannon, Brian Green, and Irina Raicu. "Ethics in Technology Practice." *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/>
- Vallor, Shannon, Brian Green, and Irina Raicu. "Overview of Ethics in Tech Practice." *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/overview-of-ethics-in-tech-practice/>
- Vallor, Shannon, Brian Green, and Irina Raicu. "Sample Design Workflow." *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/sample-design-workflow/>
- Vallor, Shannon, Brian Green, and Irina Raicu. "Sample Workshop Slides." *Markkula Center website*, June 22, 2018, available at: <https://www.scu.edu/ethics-in-technology-practice/sample-workshop-slides/>
- Vallor, Shannon, Irina Raicu, Brian Green. "Technology and Engineering Practice: Ethical Lenses to Look Through." *Markkula Center website*, July 13, 2020, available at: <https://www.scu.edu/ethics-in-technology-practice/ethical-lenses/>
- Velasquez, Manuel, Claire Andre, Thomas Shanks, S.J., and Michael J. Meyer. "Ethics and Virtue." *Markkula Center website*, January 1, 1988, available at: <https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/ethics-and-virtue/>
- Velasquez, Manuel, Claire Andre, Thomas Shanks, S.J., and Michael J. Meyer. "Justice and Fairness." *Markkula Center website*, August 1, 2014, available at: <https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/justice-and-fairness/>
- Velasquez, Manuel, Claire Andre, Thomas Shanks, S.J., and Michael J. Meyer. "The Common Good." *Markkula Center website*, August 2, 2014, available at: <https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/the-common-good/>

- Velasquez, Manuel, Claire Andre, Thomas Shanks, S.J., and Michael J. Meyer. “Rights.” *Markkula Center website*, August 8, 2014, available at: <https://www.scu.edu/ethics/ethics-resources/ethical-decision-making/rights/>
- Walker, Kent. “Google AI Principles updates, six months in.” *Google Blog*, December 18, 2018, available at: <https://www.blog.google/technology/ai/google-ai-principles-updates-six-months/>
- World Economic Forum and Deloitte. “Global Technology Governance Report 2021: Harnessing Fourth Industrial Revolution Technologies in a COVID-19 World.” *World Economic Forum website*, December 2020, available at: https://www3.weforum.org/docs/WEF_Global_Technology_Governance_2020.pdf
- World Economic Forum, Deloitte, and the Markkula Center for Applied Ethics at Santa Clara University. “Ethics by Design: An organizational approach to responsible use of technology.” *World Economic Forum website*, December 2020, available at: https://www3.weforum.org/docs/WEF_Ethics_by_Design_2020.pdf
- World Economic Forum and Markkula Center for Applied Ethics at Santa Clara University. “Responsible Use of Technology: The Microsoft Case Study.” *The World Economic Forum website*, February 2021, available at: <https://www.weforum.org/whitepapers/responsible-use-of-technology-the-microsoft-case-study>
- World Economic Forum and Markkula Center for Applied Ethics at Santa Clara University. “Responsible Use of Technology: The IBM Case Study.” *The World Economic Forum website*, September 2021, available at: https://www3.weforum.org/docs/WEF_Responsible_Use_of_Technology_The_IBM_Case_Study_2021.pdf
- World Economic Forum and Markkula Center for Applied Ethics at Santa Clara University. “Responsible Use of Technology: The Salesforce Case Study.” *The World Economic Forum website*, September 2022, available at: https://www3.weforum.org/docs/WEF_Responsible_Use_of_Technology_Salesforce_Case_Study_2022.pdf
- World Economic Forum. “Empowering AI Leadership – C-Suite Toolkit.” *World Economic Forum website*, 2022, available at: https://www3.weforum.org/docs/WEF_Empowering_AI_Leadership_2022.pdf
- W.K. Kellogg Foundation. *W.K. Kellogg Foundation Logic Model Development Guide*. W.K. Kellogg Foundation website, 2004. <https://wkkf.issuelab.org/resource/logic-model-development-guide.html>
- W.K. Kellogg Foundation. *W.K. Kellogg Foundation Evaluation Handbook*. Better Evaluation website, 2004. <https://www.betterevaluation.org/sites/default/files/2022-07/EvaluationHandbook.pdf>

ETHICS IN THE AGE OF DISRUPTIVE TECHNOLOGIES

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As technology makes the world more complex, the choices that we need to make regarding the uses of technology also become more complicated. The goal of this book is to help decision-makers set up the right conditions within their organization for the successful navigation of this increasing complexity so that their good intentions generate the best outcomes not only for their organization and shareholders, but for society and the world as well.