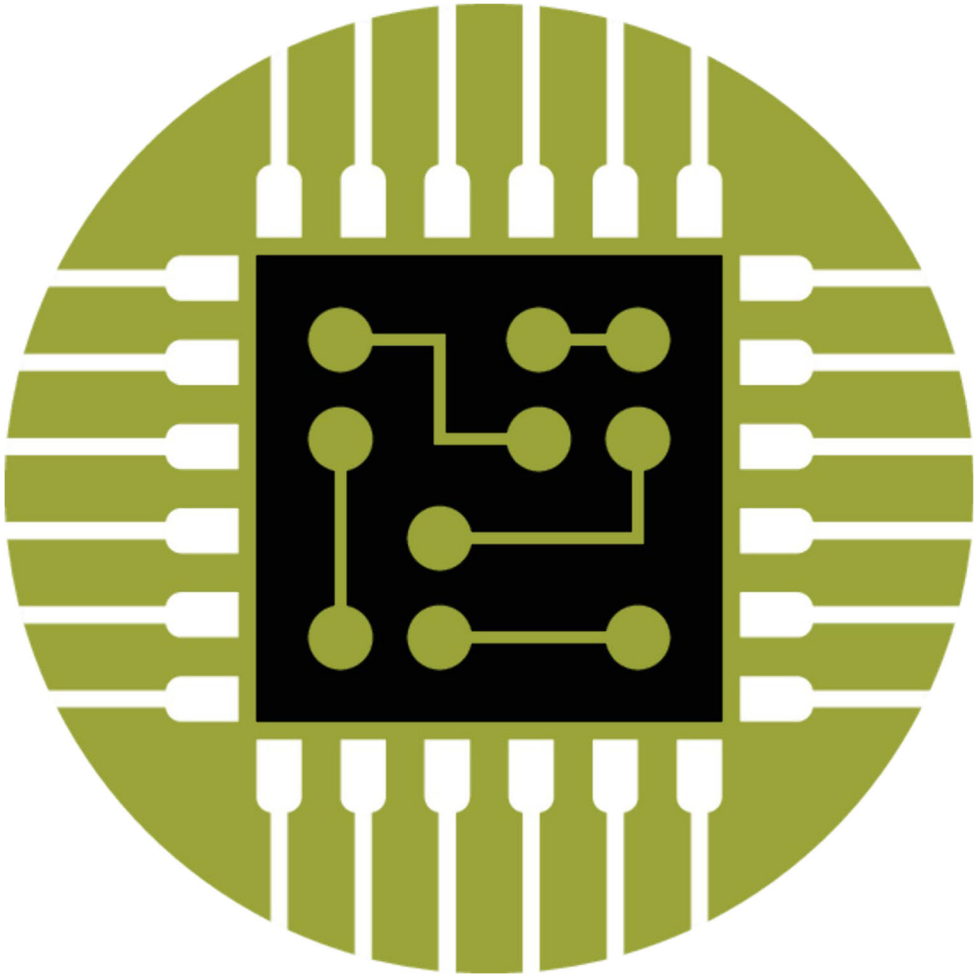

A Curriculum Framework for Ethics in Technology:
Preparing Business Students for the Future

Made possible with support from the Deloitte Foundation in collaboration with University of Arkansas, Duquesne University, University of Notre Dame, and University of Virginia

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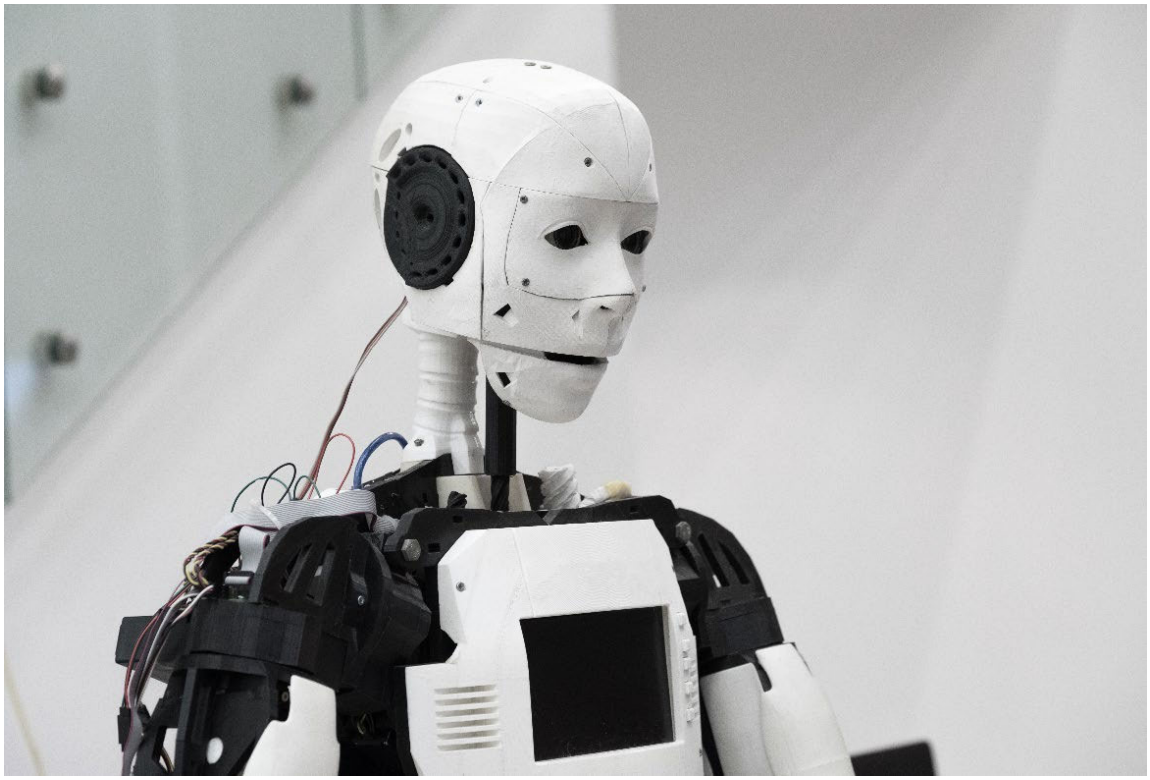
Executive Summary

The curriculum framework for ethics in technology seeks to prepare students for understanding issues associated with the intersection of technology and ethics and to assist business schools and other educational settings in curriculum development and program planning. The framework was created from a Tech Ethics Summit held virtually in October 2021. At the Summit, led by collaborators from the Deloitte Foundation, Deloitte, Duquesne University, University of Notre Dame, University of Virginia, and University of Arkansas, thirty leading academics and practitioners (see Appendix A) conducted a curriculum-focused conversation to help catalyze an agenda for transforming tech ethics education for business students using a series of thought questions around four structural areas discussed at the Summit: normative tools, technology issues, design and integration, and delivery. As a follow up to the Summit, the collaborators set out to define and present a set of topics and principles regarding business ethics and technology every business student should know. They recognized technology is never neutral; there are always ethical dimensions to every technology designed and deployed. They recognized technology is always evolving and sought to define a set of key ethics-based questions students would be prepared to address with regard to any technological development and/or application.

The resulting curriculum framework for ethics in technology strives to inform faculty as they help students articulate how to analyze and discuss the intersection of technology and ethics, to make more informed and responsible decisions, and to develop competency in the skills to act effectively upon those decisions.

The curriculum framework for ethics in technology includes twelve primary elements, ranging from value-laden biases in technology, to the purpose of the firm and goals of technology, to whistleblowing. Next, the conceptual framework is operationalized to serve as a guide for incorporating the topic of tech ethics into a business school curriculum. Depending on one's specific learning objectives, the curriculum framework could provide direction for incorporating a single module on tech ethics into an existing course or serve as the foundation for building a large degree program. Various appendices are provided at the end of this document to further define the conceptual framework and provide tools and references for educators.

Background Context



The purpose of this curriculum framework is to help prepare students, at the undergraduate and graduate levels, for understanding and handling issues, challenges, and opportunities associated with the intersection of technology and ethics. The framework is designed to assist business schools and other educational settings (i.e., as relevant, STEM programs) in curriculum development and program planning. The framework can act as a reference point for educational programs that develop modules, courses, majors, minors, or certification degrees in tech ethics.

The framework was created as a result of a Tech Ethics Summit held virtually in October 2021, where a select group of thirty leading academics and practitioners came together for a curriculum-focused conversation to discuss pedagogical innovations at the intersection of ethics and technology to help catalyze an agenda for transforming tech ethics education for business students.

Lead collaborators from the Deloitte Foundation, Deloitte, Duquesne University, University of Notre Dame, University of Virginia and University of Arkansas developed and facilitated a shared understanding of the objectives, agenda, and plan for the Summit. The mission of the gathering was to surface and understand key inputs that would later be used towards developing an open-source pedagogical framework for teaching tech ethics to business students. The collaborators set out to define and present a set of topics and principles

regarding business ethics and technology every business student should know. They recognized technology is never neutral; there are always ethical dimensions to every technology designed and deployed. They recognized technology is always evolving and sought to define a set of key ethics-based questions students would be prepared to address with regard to any technological development and/or application.

The elements of the curriculum framework were generated out of a series of thought questions around four structural areas discussed at the Summit: normative tools, technology issues, design and integration, and delivery. The framework collaborators led Summit discussions among scholarly experts in the tech-ethics space with questions about what enables students to understand ethical issues related to technology in business and society as well driving principles essential to a tech-ethics curriculum. These discussions involved exploring ideas around what students need to be able to do and know after experiencing a technology and ethics curriculum. These discussions involved considering which modules would be necessary to deliver the material and how these components could be integrated through a proper design. Professional perspectives were shared as well to support components of the curriculum, including dimensions defined in Deloitte's Technology Trust Ethics Framework (see Appendix B).

With that context in mind, the resulting Tech Ethics Curriculum Framework presented here is positioned to inform faculty to help students articulate how to analyze and discuss the intersection of technology and ethics to make more informed and responsible decisions, as well as to develop competency in the skills to act effectively upon those decisions. This article offers a blueprint for users to implement the curriculum framework.

Tech Ethics Curriculum Framework

The Tech Ethics Curriculum Framework is grounded in twelve conceptual elements around which class modules, courses, programs or degrees can be designed. These major conceptual elements are presented at a high-level to provide flexibility to instructors to include aspects pertinent to their immediate needs. Each component described includes suggested sources for instructors to utilize in their classes or modules. Guidance about how to use the framework and its integration with these elements is presented in the subsequent section. The table starting on Page 6 is designed to serve as a blueprint to help educators put these components into practice.

1. **Value-laden biases in technology.** *Rather than focus technology as the actor that 'does' things and is at fault (technological determinism) or focus on the users of the technology as determining the outcome (social determinism), allow for value-laden biases of technology to preserve human agency while acknowledging the moral implications of technology.*
    - Winner, Langdon. Do Artifacts Have Politics.
    - Friedman and Nissenbaum. Bias in computer systems.
    - Latour, Bruno. Where are the missing masses? The sociology of a few mundane artifacts.
    - Akrich, Madeleine. The de-scription of technical objects.
    - Bijker, Wiebe E. Of bicycles, bakelites, and bulbs: Toward a theory of sociotechnical change.
    - Possible cases/case topics: Medical triage AI, Mortgage approval AI.

2. **Normative and pedagogical approaches.** *By using both a traditional normative approach as well as critical theories of ethics, we broaden the lens by which we examine technology. Given the role of power and markets in the deployment of technology, critical theories highlight the role of power and marginalized stakeholders in the analysis of technology. And then Giving Voice to Values (GVV), for instance (see Appendix B), invites learners to apply organizational and interpersonal skills to craft action plans and scripts to implement their values-driven decisions, thereby adding the "action" component to the building of awareness and analysis capacities*.
    - Gentile, Mary. Giving Voice to Values.
    - Vallor, Shannon. Deontology, Consequentialism, Virtue Ethics.
    - Gilligan, Carol. Critical theories, ethics of care.
    - Possible cases/case topics: Trolley problem (and problems with it), Large language models.

3. **Fairness and justice in technology.** *In addition to readings on discrimination, theories of justice and fairness are key to technology ethics because many technologies are designed to allocate 'things' or 'goods.' Too much work currently focuses on discrimination as the sole measure of fairness. Traditional theories of justice illustrate why relying on mathematically convenient definitions of fairness (via discrimination measures) does not address all questions of fairness***.**
    - Rawls. A Theory of Justice.
    - Walzer, M. Spheres of Justice.
    - Selbst and Barocas, Big Data's Disparate Impact.
    - Possible cases/case topics: COMPAS, university admissions programs, hiring algorithms, mortgage and credit risk AI.

4. **Privacy.** *Traditional definitions of privacy do not allow for privacy expectations in public. However, much of our lives are lived 'in public' and captured. These readings help illustrate how we can think about privacy in public and mediated by technology.*
    - Nissenbaum, Helen. A Contextual Approach to Privacy Online.
    - Martin, Kirsten. Understanding Privacy Online.
    - Possible cases/case topics: How a Company You've Never Heard of Sends You Letters about Your Medical Condition. Gizmodo.

5. **Surveillance.** *New forms of data collection – online and offline – make surveillance more common and even its own industry. Technology has long been used to surveille individuals. As opposed to privacy, surveillance is the persistent tracking of individuals – tracking that cannot be avoided – to control the surveilled.*
    - Lyon, David. From Big Brother to Electronic Panopticon.

- Possible cases/case topics: Facial recognition platforms, social credit scores with location data.

6. **Purpose of the firm and goals of technology.** *The development and use of technology presumes a particular goal for the organization to justify its use. Technology can provide opportunities for firms to harm marginalized stakeholders while profitable in the short term. New technology should be held to the same standards as other corporate initiatives – justified as being within the purpose and values of the firm.*
    - Freeman. Stakeholder Theory.
    - Stout, Lynn A. The problem of corporate purpose.
    - Frank, Robert H. Can socially responsible firms survive in a competitive environment.
    - Possible cases/case topics: Emotion facial identification cases; Race/Ethnicity facial identification cases, Social media recommendation algorithms.

7. **Transparency and accountability.** *Requests for greater transparency around a technology would mean providing enough information so others can understand the performance of the technology or program. However, transparency can be seen as in service of an explanation, for accountability, and for contestability. In other words, the request for more knowledge is in service of a greater need. In addition, students should think through what knowledge is needed in order to ethically adopt a technology; is it ever ethical to adopt and use a technology that you cannot explain?*
    - Mulligan, Deirdre K., et al. Shaping Our Tools: Contestability as a Means to Promote Responsible Algorithmic Decision Making in the Professions.
    - Possible cases/case topics: Cheating detection programs, teacher evaluation systems.

8. **Manipulation and gamification.** *Manipulation and gamification, dark patterns, and deepfakes seek to influence an individual – their beliefs, their behaviors, their decisions – in a manner not obvious to the target. When employed in their best possible use, these tactics act for the betterment of the individual (the target) and society. However, when employed in alternative uses, these data analytics tactics can be exploitive and undermine individuals' decision making.*
    - Kim, Tae Wan and Kevin Werbach. Ethics of Gamification.
    - Bhargava, Vikram R., and Manuel Velasquez. Ethics of the attention economy: The problem of social media addiction.
    - Possible cases/case topics: Deepfakes, gamification of workers, dark patterns and rideshare drivers.

9. **Measuring accuracy and effectiveness.** *Whether technology works is a phenomenon constructed by the value created by the organization. Readings illustrate how effectiveness and accuracy are designed to judge technology and the ethical implications of those definitions.*
    - Collins and Pinch. The Golem at Large.
    - Birhane et al. 2021. The Values Encoded in Machine Learning Research.
    - Thomas, Rachel, and David Uminsky. The Problem with Metrics is a Fundamental Problem for AI.
    - Possible cases/case topics: Predicting criminality in students, cheating detection programs.

10. **Safety and security.** *Technical safety and security are often discussed interchangeably, but many experts agree they are distinctive concepts. Safety generally refers to the proper internal functioning of a technology and the avoidance of unintended human harms. For example, my car is safe to drive; it has air bags, driver assist and other safety features. Security generally refers to mitigating external threats such as unauthorized access and use. For example, my car is secure because it can only be unlocked and driven with a key; my mobile phone app can geolocate the car at any time.*[1]
    - Fjeld, J., Achten, N., Hilligoss, H., Nagy, A. and Srikumar, M. (2020). Principled Artificial Intelligence: Mapping Consensus in Ethical and Rights-based Approaches to Principles for AI.
    - Possible cases/case topics*:* You Can't Tell Anyone, Ubiquitous Surveillance, Held Hostage in the 21st Century: Cybersecurity, Ransomware, and Crisis Management.

11. **Whistleblowing**. *Pushing the ethical evaluation of the design and development of whistleblowing to outsiders has implications as to how corporations critically evaluate their technology: who can ask questions, what questions can be asked, and how any critical, ethical evaluation is performed. Corporations pushed back against being responsible for the moral implications of their technology by limiting the type of research conducted in the organization and by outside researchers.*
    - Rudner, Richard. The scientist qua scientist makes value judgments.
    - Possible cases: Current whistleblowing cases, EPA violations cases.

[1] The Certified Information Systems Security Professional (CISSP) Security Management and Practices had a chapter on **SECURITY** (not Safety); It's the basic CIA model (Confidentiality, Integrity, and Access) with some overlap with privacy, accountability, etc. The World Economic Forum has a page on SAFETY, and the page points to the Australian Government's "Safety by design principles" but it has a lot of overlap (transparency and accountability).

12. **Emerging topics.** *Since the tech-ethics space is constantly evolving and developing, this component should remain flexible and current. As issues arise, business and society need to understand and address them.*
    - Several organizations (such as the World Economic Forum and the White House National Science and Technology Council) publish annual lists on critical and emerging technologies and research that can be used as references for relevant emerging topics.

Operationalization of the Tech Ethics Curriculum Framework

The chart below is intended to serve as a guide that could be used to operationalize the major conceptual elements discussed above. The chart illustrates a flexible approach to incorporating the topic of tech ethics into a business school curriculum while addressing the needs of the individual instructor. The first column is for a elective business course in tech ethics applicable to all business students. The second column is for certificate programs and tech-ethics majors/minors, and the last column is designed for a comprehensive common core course for a concentration in tech ethics. Dependent on one's learning objectives, this framework can be used for the following options - incorporating a single module on tech ethics into an existing course, creating a core course, incorporating tech ethics into an elective business course, or building out a large degree program.

Each column describes which elements of the framework are most critical to include in each type of curriculum, depending on whether an educator is developing an elective course, a major, or a common core program. The labels are progressively designated to signify increased depth of coverage. Elements labeled "Selective" indicate instructors should try to focus only on particular aspects of the element in their delivered content. Those labeled "Suggested" indicate instructors should try to incorporate the entire element into their content. The label "Recommended" implies a stronger level of coverage of the element should be included in the course content. Finally, "Required" means the element needs to be covered fully within the curriculum.

	Curriculum: Elective Business Courses	**Curriculum: Major/Minor/ Certification Degree Program**	**Curriculum: Tech Ethics Common Core Course**
1. Value-laden biases in technology	Recommended	Recommended	Required
2. Normative and pedagogical approaches	Suggested	Suggested	Required
3. Fairness and justice in technology	Recommended	Recommended	Required
4. Privacy	Selective	Suggested	Required
5. Surveillance	Recommended	Recommended	Required
6. Purpose of the firm and goals of technology	Selective	Selective	Recommended
7. Transparency and accountability	Recommended	Required	Required
8. Manipulation and gamification	Selective	Suggested	Recommended
9. Measuring accuracy and effectiveness	Selective	Suggested	Recommended
10. Safety and security	Selective	Recommended	Required
11. Whistleblowing	Selective	Suggested	Recommended
12. Emerging topics	Selective	Selective	Recommended

Definitions

- **Elective Business Courses:** Exposure to and general awareness of basic concepts and key issues related to a selected set of the framework elements
- **Major/Minor/ Certification Degree Program:** Understanding of concepts and issues associated with each of the framework elements.
- **Tech Ethics Common Core Course:** Ability to assess and develop applications and approaches to address issues and concepts within the framework elements.

As instructors put the Tech Ethics Curriculum Framework into action, they will determine what level of coverage across which of the major conceptual elements they wish to cover.
The chart above may be helpful in making those determinations in light of the amount of time instructors desire to devote to the topic in their elective course module, major, minor, or certificate degree, or full common core program curriculum. For example:

If an instructor teaches an HR elective course that addresses employee selection and recruitment, they might decide to include a discussion of AI applications for hiring processes.[2] They might select a case study or article that discusses the use of AI analysis of video-taped interviews or the use of AI analysis of resumes for interview selection. They might consider the research data on bias in such analyses and apply normative ethical decision-making frameworks to consider the most ethical and responsible choices about whether and/or how to use such tools. Once the decision is made, the GVV pedagogy (see Appendix B) can enable learners to consider how to influence and implement their choices. Or a case could be used where the introduction of bias into the hiring process via AI analysis has already been identified, and learners apply the GVV methodology to consider how they can influence and implement a decision within the organization not to use a particular AI tool.

Instructors participating in a more involved treatment of tech ethics in a major, minor, or certificate degree program, would develop a curriculum that provides a deeper understanding of the framework elements than would be the case in an elective course. For example, whistleblowing (framework element 11), may not be an appropriate topic in a single module on tech ethics as part of a broader business elective course. But, for a major or minor or certificate degree program, this topic is labeled, "Suggested" as issues surrounding whistleblowing have effects on the ethical evaluation and reporting of technology applications and usage. Safety and security (framework element 10) is another topic that would receive greater coverage in a tech ethics in a major, minor, or certificate degree program as it is labeled "Recommended" on the chart above. Teaching students to avoid unintended harms of technology highlights many ethical principles that would be necessary as part of a program that affords a focused deeper dive into tech ethics.

For a Tech Ethics Common Core Course, the most comprehensive development and coverage of the twelve curriculum framework elements is needed. As noted in the above chart, Emerging topics (framework element 12), requires only selective coverage in an elective course, or major, minor, certificate degree program. But for a core course, it is recommended there be a focus on specific cutting-edge topics, such as the ongoing evolution of generative AI. Many of the elements in this third column are labeled, "Required" as more extensive discussion and presentation of the elements would be necessary within a full Tech Ethics Core. For example, privacy (framework element 4), would receive significant attention in such a program. Online

[2] Business Case Studies & Business Publications - Darden Business Publishing. Ethical Programming of Algorithms: How to Deal with Ethical Risks of AI Tools for Hiring Decisions? (A) (virginia.edu)

privacy is a ubiquitous issue and a full understanding and application of this topic in possible cases is highly desirable. Furthermore, an integration across and interactions among the framework elements would be useful in this context. In other words, students would need to comprehend how privacy (framework element 4) is affected by surveillance (framework element 5).

Conclusion

The Tech Ethics Curriculum Framework is designed to offer multiple options for a broad range of faculty to implement concepts and material into their pedagogy within the tech ethics space. The objective is to provide a flexible framework to aid instructors as they seek to help students achieve competency to analyze and discuss the intersection of technology and ethics, make informed and responsible decisions, and develop the skills to act effectively upon those decisions.

The framework is intended to be adaptive to various instructor needs ranging from a single topic module to a certificate or degree program to a full course. The hope is this tool may be widely disseminated and built upon across business schools around the world.

Ultimately, as a consequence of the Tech Ethics Curriculum Framework being used robustly in educational settings, it is intended to inform the behaviors students who engage with it which they can later put into practice as they move into to their career settings.

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Deloitte Foundation/Deloitte Representatives present at the 2021 Summit[3]

Beena Ammanath, Executive Director Global Deloitte AI Institute, Deloitte Consulting LLP

Catherine Bannister, Managing Director Technology Strategy, Deloitte LLP

Mike Bechtel, Chief Futurist & Managing Director, Deloitte Consulting LLP

Janet Butchko, Senior Manager, Deloitte Foundation

Peg Levine, Manager, Deloitte Foundation

Jessica Sierra, Manager Technology Strategy, Deloitte LLP

Glenn Stastny, Chief Ethics and Compliance Officer, Deloitte & Touche LLP

Sheila Williams, Managing Director, Talent Acquisition, Deloitte Services LP

[3] Titles listed for authors, collaborators and other participants were current at the time of the Summit

Faculty Representatives from the following institutions were present at the 2021 Summit

Carnegie Mellon University

Duquesne University

Fordham University

Morgan State University

New York University

Santa Clara University

University of Arkansas

University of Illinois

University of Notre Dame

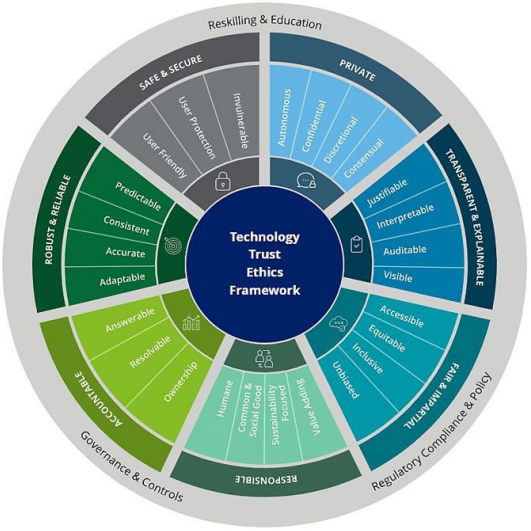
University of Pennsylvania

University of St. Thomas

University of Virginia

Appendix B: Pedagogy: Supplemental Resources

Deloitte's Technology Trust Ethics Framework



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Deloitte's Technology Trust Ethics Framework is comprised of foundational elements, dimensions and subdimensions, and corresponding definitions, all of which are designed for use and reference when building trainings and curriculums. The Framework offers a structured approach to critically assess one's technology, tool, or application use case and its potential impact to users. The dimensions that comprise the Tech Ethics Curriculum Framework can be further explored by instructors through supplemental course materials. The textbook *Trustworthy AI* by Beena Ammanath can be leveraged by instructors to further supplement this curriculum and expand on the Framework dimensions in greater detail.

Giving Voice to Values

Giving Voice to Values (GVV) is an action-based pedagogical approach to values-driven leadership development in business education and the workplace that can be utilized in classes and training programs around Tech Ethics issues.[4] Drawing on actual experience and scholarship, GVV fills a long-standing critical gap in the development of values-centered leaders. GVV is not about persuading people to be more ethical. Rather GVV starts from the premise that most of us already want to act on our values, but that we also want to feel that we have a reasonable chance of doing so effectively and successfully. This pedagogy is about raising those odds. Rather than a focus on ethical *analysis*, the Giving Voice to Values approach[5]

[4] GVV is based at University of Virginia-Darden School of Business, having been launched by Aspen Institute as Incubator & Founding Partner, with Yale School of Management; then supported at Babson College 2009-16.

[5] The GVV materials are available at http://store.darden.virginia.edu/giving-voice-to-values (or under the "Curriculum" tab at www.GivingVoiceToValues.org . (Teaching notes and B cases are available to registered and approved faculty members. Register at https://store.darden.virginia.edu/login .) The book from Yale University Press is *Giving Voice To Values: How To Speak Your Mind When You Know What's Right*, www.MaryGentile.com (available in Chinese and Korean).Ped A series of 6 online interactive, social cohort-based customizable modules are also available: visit https://players.brightcove.net/3326885378001/default_default/index.html?videoId=4134427723001 and Plans | Nomadic Learning. Additionally a 4 week online course (MOOC) on "Ethical Leadership through Giving Voice To Values" is available from Darden in partnership with Coursera at https://www.coursera.org/learn/uva-darden-giving-voice-to-values

focuses on ethical *implementation* and asks the question: "What if I were going to act on my values? What would I say and do? How could I be most effective?".

The GVV pedagogical approach can be used in a variety of ways but, typically, it is integrated into existing courses on other topics where one of the issues to be addressed considers the implications of using technology in various business-related functions (e.g., hiring) or in the development of new products (e.g., diagnostic tools, security tools, etc.).

The pedagogical protocol involves identifying the stakes for all the impacted parties, not in order to do a stakeholder analysis because as stated above, the protagonist already knows what they are trying to achieve. Rather the identification of stakes or risks or motivating factors for all impacted parties is done in order to identify potential points of leverage and effective ways to re-frame the decision so as to be most persuasive. The next step involves identifying the most likely "Reasons and Rationalizations" or objections to the ethical position that the protagonist is taking, so as to consider possible ways to respond and address these arguments. Finally, the student will utilize these reflections to craft the most effective scripts and action plans to achieve their goal. They then share and rehearse their approach with peer coaching from fellow students and instructors to enhance the approach. It is important to understand that this "pre-scripting" is not simply a speech. It is more akin to a "decision tree" of scripts and actions. That is, if the protagonist opens with one approach and encounters a counter, then what would they say or do, or what information would they need to gather, or whom else might they want to engage with, and so on.

As a follow-on to the Deloitte Foundation's support for the development of a Curricular Framework for Ethics in Technology in Business Education, the Foundation also supported the development of a suite of new GVV-style case studies to complement existing GVV cases around Tech Ethics issues[6]. These cases are free to educators and focus upon topics such as the use of AI in hiring decisions; bias in the use of AI for diagnostic procedures; privacy challenges in tech-enabled security processes; corporate responses to ransomeware attacks; and decisions about the release of internal research findings regarding the impacts of social media. Other tech-related GVV cases focus upon the negative impacts of social media on youth; racial bias in AI-enabled sentencing tools; etc.

[6] The cases can be found at https://store.darden.virginia.edu/WidgetsBrowse/categoryNew?categoryId=580

Appendix C: Assessment Techniques

Suggestions for methods to evaluate student learning:

- Create a case competition using technology ethics situations.
- Use stories in the press.
- Draft paper on AI and moral distancing.
- Implement a year-long project focusing on humans at the core of technology design.
- Take current event and frame the technology issue using ethical principles. Ask: "what should have been done?" Frame the case by knowing what is the right thing to do.
- Have them "do" something - students learn by doing.
- What questions do students need to ask? What do they need to ask the proper set of questions?
- Create quantitative cases with embedded ethical issues about technology.
- Role-playing exercises emphasizing various stakeholders engaged in technology development or use (e.g., GVV).
- Research real world organizations that are addressing technology issues directly, examples of humanistic management.
- Create a corporate ethics training survey focusing on technology.
- Explore a set of virtues to aspire leadership best practices.
- Create a space where students can discover their own virtues and values to which they wish to aspire.
- Create technology hack-a-thons.
- Utilize a community feedback model for technology companies to adopt.
- Frame assessment of student activities around the "knowing-doing-leaning" model.
- Use self-assessments, empowering students to address technology ethics challenges.