Playing the Belly of the Beast: Games for Learning Strategic Thinking in Tech Ethics

Popular abstract: Amidst a rise in systemic injustices perpetuated by technology, there has been a growing focus on tech ethics in education. While ethics courses often teach students how to spot and deliberate over ethical issues, they rarely focus on what students can do to affect these issues as engineers in tech corporations. Given that corporations often retaliate against activist employees, learning how to strategically navigate corporate structures is necessary to practice tech ethics. Digital games can provide one avenue to help students learn how to do this as they can simulate corporate environments such as their structures of access, power, and market-culture.

This paper asks: "Can games be designed to help students learn strategic ethical inquiry, at a distance from the workplace? If so, how?" To explore this question, I discuss the design of a game, *Lights Out Warehouse* (in-progress), which situates players as an engineer in a tech corporation seeking to automate its warehouses. The game is an interactive digital narrative revolving around the player's conversations with the automation team, warehouse workers, and managers. While the game has multiple endings, the challenge is learning how to navigate its corporate structures and persuade others towards solutions that work for all: where workers have more rights, the company benefits, and players keep their job.

Keywords: tech ethics, interactive digital narratives, higher education, engineering, automization, power

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1. INTRODUCTION

Technology is becoming increasingly complicit in social injustice. Mass surveillance, automation, and predictive algorithms have amplified systemic inequalities (Benjamin 2019; Parvin 2019; JafariNaimi 2018; Eubanks 2018). Yet, there has also been a rise in ethical awareness about tech, particularly in design/engineering education. A broad movement for social justice in engineering has been taking shape in the past decades (Leydens and Lucena 2018; Riley et al. 2009; Karwat 2020) and many tech/engineering courses are laying more emphasis on ethics (Fiesler, Garrett, and Beard 2020).

However, educational approaches rarely engage students with strategies to navigate the structural challenges of *strategic ethical inquiry* in tech corporations as engineers and designers (Anupam 2022). This refers to inquiry that seeks to achieve ethical outcomes and practices by finding, incorporating, and acting on knowledge about *organizational structures*; that is, the implicit or explicit rules or norms that govern resources and people within an organization. Specifically, I focus on three kinds of organizational structures: (1) the *material structures* which are concerned with how resources are distributed and accessed; (2) the *sociopolitical structures* which are concerned with issues of power and agency of people in the organization; and (3) the *cultural structures* that encompass the underlying shared norms, values, and beliefs of the organization.

Learning strategic ethical inquiry is important, as practitioners in tech organizations must tackle structural challenges such as limited agency and the possibility of retaliation by their company in order to adhere to their ethical values. This is not easy, even for established practitioners. For example, Timnit Gebru was allegedly fired from Google's AI Ethics research team for raising concerns about the racial biases of Google's technology (Metz and Wakabayashi 2020). This situation—where one is trapped within a potentially hostile system— is the "Belly of the Beast" problem (Kvande 1999). This problem is even harder for students to learn to navigate, as they are not even situated in the "belly" to begin with.

One approach to this problem is to employ games to recreate the structures of tech organizations (Schrier 2021; Anupam 2022). They can simulate complex organizational structures and allow students to explore them without fear of retaliation. In particular, Interactive Digital Narratives (IDNs) are increasingly becoming widespread media for their ability to engage audiences with complexity safely (Koenitz, Barbara, and Eladhari 2021).

Drawing on the above points, I ask:

- Can digital games be designed to help students learn strategic ethical inquiry, at a distance from the workplace? If so, how?

In particular, I explore this question in relation to warehouse automation. As companies like Amazon increasingly aim to make warehouses "lights out" (i.e., fully automated), workers are beginning to unionize (Clark 2022). This paper discusses a game, called *Lights Out Warehouse* (in-progress), that explores the role of automation engineers in the middle of this conflict as they aim to support exploited warehouse workers, while also retaining their job, and benefiting the company. This requires learning how to tactically navigate the corporate structures of their fictional tech company, NileCorp. While the game does not aim to provide a detailed blueprint of what real engineers can do (as real situations are far more complex), its primary goal is to illuminate the importance of strategic thinking to ethical practice. In doing so, it aims to build on and contribute towards movements for social justice in engineering more generally.

2. BACKGROUND

There has been a rise in digital games that focus on navigating structural challenges in a variety of ethically contentious contexts. This is partly because games, and particularly Interactive Digital Narratives (IDNs), have affordances that are conducive to fostering engagement with complex systems. They afford "multilinear and multi-perspective narratives (including conflicting views)" that are ideal for exploring different ethical standpoints; their procedurality allows for the simulation of complex systems; they support increased engagement due to continuous feedback and interaction; and they allow players to "fail safely" due to their simulated nature (Murray 2012; Anupam 2021; Koenitz, Barbara, and Eladhari 2021).

However, there is still a key gap in games (and IDNs) in relation to the topic of this paper, i.e., they have rarely situated players in the position of an engineer in an ethically challenging situation.

Some games that have focused on ethically problematic situations but not in a corporate tech organization. For example, games such as *Papers, Please!* (Formosa, Ryan, and Staines 2016) and *This War of Mine* (De Smale, Kors, and Sandovar 2019) are effective at simulating the difficult ethical decision-making needed in war-like situations. Games that *do* focus on tech corporations rarely explore the problem of how to do ethical inquiry *as* a designer/engineer. For example, in *Union Drive* (Matajuegos 2021) or *Sim Sweatshop* (Norridge 2012), players assume the role of the exploited workers attempting to better their own situation. Finally, games that position players as engineers in tech organizations such as *Eliza* (Zachtronics 2021) do not engage players with the structural challenges of realizing ethical outcomes and goals. For example, in *Eliza*, players must decide which philosophy they ascribe to in relation to the use of AI in mental health counseling, such as using it to collect data for healthcare or opposing it. However, it focuses less on what one can do to *change* the situation within corporate structures.

What do I mean by corporate "structures"? Drawing on my previous work (Anupam 2022), which draws from Iris Marion Young (1990) and Klein and Kleinman (2002), I understand "structures" to mean the implicit or explicit rules that govern what one can or cannot do in a given environment. Notably, I focus on three kinds of structures: distributive structures, power structures, and cultural structures (or simply, culture). Distributive structures refer to the rules that govern how material goods are shared in a corporation, such as rules of the market and internal wage structure. Power structures refer to the rules which govern who has authority over whom, such as the hierarchy of management and the division of labor. Culture refers to the shared norms and beliefs of people, such as market fundamentalism (Metcalf, Moss, and boyd 2019).

3. *LIGHTS OUT WAREHOUSE*: GAME DESIGN

Lights Out Warehouse is designed as a conversation-based interactive digital narrative (IDN). It draws on a review of research on warehouse and tech workers, particularly *The Cost of Free Shipping: Amazon in the Global Economy* (Alimahomed-Wilson and Reese 2020) and its essays on Amazon's warehouse workers. The goal of making the game is to explore if IDNs can teach students to engage in strategic ethical inquiry as future engineers in a tech corporation.

To do this, the game situates the player as an automation engineer in a fictional eCommerce corporation called NileCorp who must navigate an ethically challenging situation. Their team's "official" task is to automate the local warehouses, which will eradicate many warehouse workers' jobs. Yet, not automating at all can lead to the company losing market share. The player's goal in the game is to develop and realize ethical resolutions that support the workers, the engineering team (including themselves), and the company.

More specifically, players must discover that they can act in two key ways. First, they can persuade the warehouse workers to unionize before they are replaced. Simultaneously, they can also persuade their team to develop automation tools that assist workers rather than replace them. Collectively this approach will provide a suitable (albeit temporary) ethical resolution within the game. While players will be able to sense their progress through conversations with the other characters (such as if they are being persuaded or not), they will only know if they have been successful by the final act of the game.

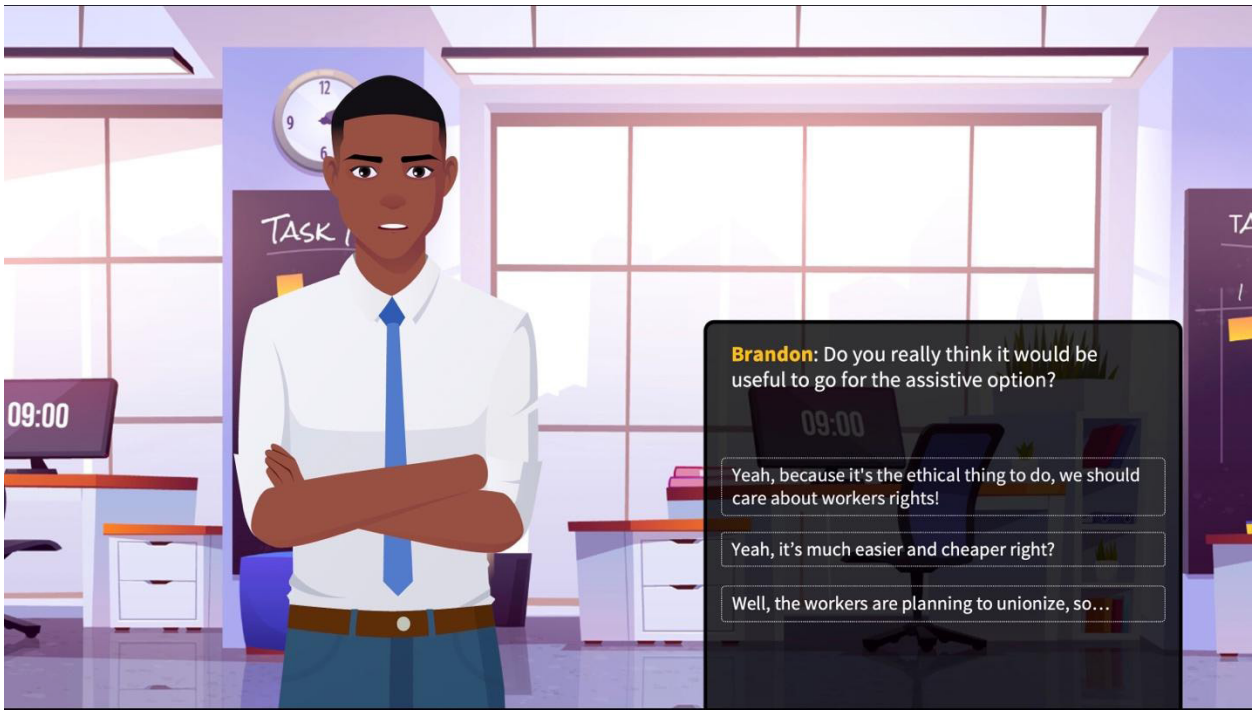
The game progresses as a sequence of conversations with different characters. Each conversation takes the form of a series of multiple-choice statements where players decide what to say and how to say it. Their choice affects the direction of the conversation and four key variables of the other characters—their trust in the player, their trust in other characters, their support level for unionization, and their support level for different kinds of automation robots (full automation, semi-automation, assistive automation). The game is currently in an early prototype stage and it is planned to have five main story acts. Each act will be a series of conversations with different characters. Once the game is finished, the aim is to get feedback from real union and tech workers, and revise it for release. Here, I discuss the planned design of the 5 story acts: The Research, The Robot, The Warehouse, The Slowdown, and The Deadline.

Act 1: The Research

The first act focuses on information gathering. The player learns about their automation team, the local warehouse which they are to focus on, and the key objective assigned to them by the management—to improve the output of their warehouses. Through conversations with their manager (Figure 1), teammates, and warehouse workers, the player learns of the game-world: the beliefs/backgrounds of different characters, the plight of the warehouse workers, and a highly competitive automation and

labor market. A key choice in this phase involves deciding how to spend time with other characters. The more the player focuses on building a positive relationship with a character, the more they are likely to get their trust and support.

Figure 1: Screenshot of current game design showing a conversation with the manager.



Act 2: The Robot

The key issue in the second act is deciding what option to pursue to improve warehouse output—full automation (replace workers) or assistive automation (support workers). What decision is taken depends on factors such as how many team members support it, the evidence for it, and who is present. These factors play out through conversations with NPC characters. For example, to persuade the manager to support the assistive automation option, the player can tell them that the workers are planning to unionize. This takes advantage of the fact that managers are afraid to lose their jobs if the workers do unionize. Yet, such an argument also carries a risk. The manager may use this information to strengthen anti-union efforts rather than listen to the player. Having the support of other engineers is crucial as more voices are hard to ignore.

Act 3: The Warehouse

The third act focuses on the warehouse. As the team begins developing an automation system based on the decision in the previous act, the warehouse workers have their own debates about unionization. The key issue is in garnering enough support to call for a unionization vote. By default, most workers are not interested in conversations about unions or are anti-union. There are two key strategies the player can try to change this situation. The first is to get outside support for unionization. This would involve reaching out to a college friend who is part of a large union organization such as the Amazon (NileCorp) labor union. Such support can give more legitimacy to the unionization effort, but it may

not be effective locally if these organizations are considered to be "outsiders" by warehouse workers and may be corrupt. The second approach is to share inside information with the workers about the automation plan. Players can share details about what tasks they are planning to automate, how quickly it will be done and so on. This can alert the warehouse workers and motivate them to unionize more quickly. However, if the player stays away for too long from the office or they are found talking to the warehouse workers too often, their manager might get suspicious of them.

Act 4: The Slowdown

The fourth act returns after some months. The key issues involve progress on the automated system (decided in Act 2) and the upcoming deadline.

If full automation has been selected in Act 2, things are not going so well. It is much harder after all. There are two options that the player can pursue here: they can attempt to push the deadline and keep trying for full automation; or stick to the deadline, but narrow the focus of the full automation robot to a selective robot, only focusing on a specific kind of object such as cans.

If partial automation was selected in Act 2, then things are going well, and all that is needed is some testing with warehouse workers. Again, the player has two possibilities. They can attempt to push the deadline by deliberately slowing down testing. That means colluding with the warehouse worker participants to delay the testing process. Or they could stick to the deadline and test normally.

If the player manages to convince their team to push the deadline by a few more months in either of these scenarios, then it will significantly increase the chances of the workers unionizing as they have more time until the robot is built to form a consensus.

Act 5: The Deadline

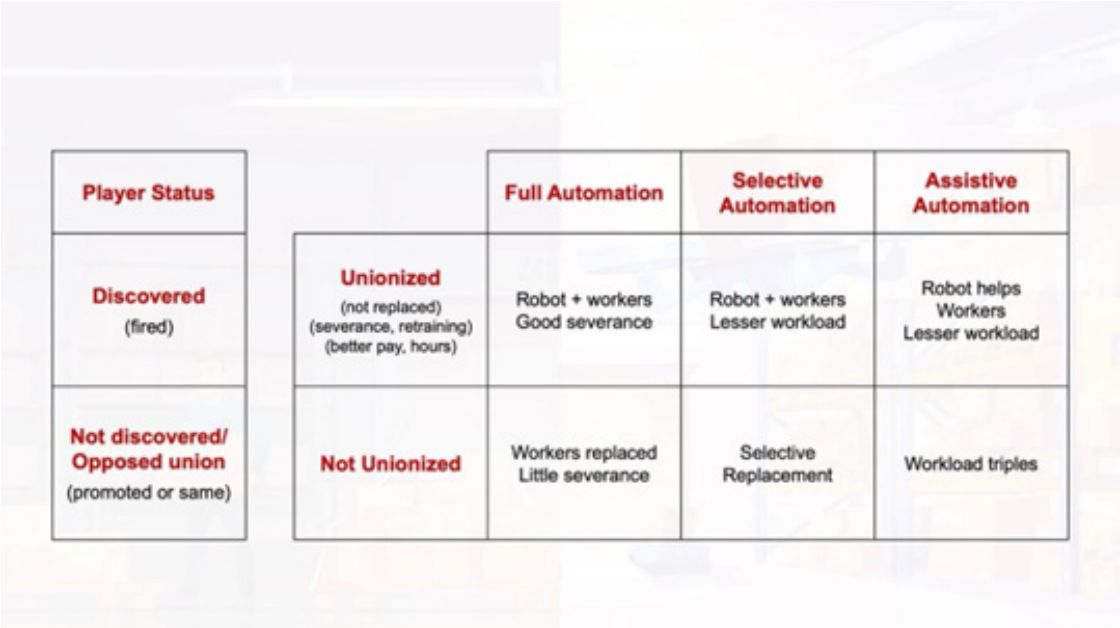
The final act of the game focuses on different possible endings based on three key variables (Figure 2): unionization, the kind of automation system, and the manager's opinion of the player.

If workers do not vote to unionize and the fully automated solution works, the company will start replacing all workers with their automated counterparts. If the selective automation robot works out, then the company will replace only those workers whose objects are now picked by the robot. In either case, if the player did not support unionization and instead supported the full/selective automation decision, they will be viewed favorably by the manager, given a raise, and promoted to manage other warehouse automation projects.

If the workers do not vote to unionize and the assistive automation robot works out then the workload of the workers will triple. For example, if the robot assisted the worker by bringing them shelves, workers will spend more time picking and stowing, and less time walking. Given their increased efficiency, the company will assign them three times the items to pick and stow.

If workers do vote to unionize in time, they stop the fully automated solution from being enacted. Further, they will demand higher pay, lower workloads, better severance packages, and retraining programs if they agree to be automated. Robots will assist workers in all cases here. While the company will not profit as much as it could have compared to the fully automated solution, the enhanced efficiency achieved by assistive automation helps it retain its market share. This is the best case scenario in the game.

Figure 2: Chart of possible outcomes and their dependencies



Player Status		Full Automation	Selective Automation	Assistive Automation
Discovered (fired)	Unionized (not replaced) (severance, retraining) (better pay, hours)	Robot + workers Good severance	Robot + workers Lesser workload	Robot helps Workers Lesser workload
Not discovered/ Opposed union (promoted or same)	Not Unionized	Workers replaced Little severance	Selective Replacement	Workload triples

4. DISCUSSION

In this section, I briefly discuss how the game aims to support players in strategically navigating the corporate distributive system, its sociopolitical structures, and its tech culture outlined earlier.

First, the player needs to know and leverage distributive structures such as the surveillance system, the budget/time of the company, and the warehouse wage structure. For example, they cannot meet openly with the warehouse workers and discuss unionization within the company premises, or they risk being caught. Rather, they have to persuade the workers to meet them in another location (such as the local bar).

Second, players engage with sociopolitical structures such as the company hierarchy, the social groups/dynamics of employees, and the fears and desires of different individuals. For example, players may realize that while the manager has power over the team, this power is contingent on the team's collective compliance. Consequently, one can leverage a united team front to persuade the manager to make decisions the team wants.

Finally, players have to engage with cultural structures such as the union culture of the warehouse and company, the market fundamentalism of the manager, and the technological solutionism of the engineers. For example, to tackle the cultural mindset of technological solutionism (that technology can solve all problems), players must convince the other engineers to question why their assigned problem ("improve warehouse output") should be accepted as given. Why must the problem be only about packages and not also about workers' rights?

Through this design, the game aims to encourage students to consider not just the technical aspects of their work, but also the material, social, and cultural structures of their organizations in order to practically bring about ethical outcomes.

5. CONCLUSION AND FUTURE WORK

This paper describes the design of an in-progress game to teach strategic ethical inquiry. It explores how games for teaching tech ethics rarely focus on the challenges of strategic ethical inquiry in a

tech corporation. The game attempts to approach this gap in the context of warehouse automation by simulating players as engineers in a large eCommerce corporation. Players must learn to strategically navigate corporate structures in the game to support worker's rights, while also retaining their job, and benefiting the company. In doing so, the game highlights how it is necessary to consider practical structural challenges as part of ethical deliberation.

Future work for the game lies in two key directions. First, the content of the game will be revised to be more accurate based on interviews with activists and engineers. Second, I aim to have the game be part of real ethics courses where it can help students learn the basics of ethical strategization. I envision extending the digital game to a tabletop variation where students assume the role of the game's different characters and explore new possibilities/strategies, thereby organically extending the discourse initiated by the digital version. The game can also be redesigned by students, as the process of design itself can teach students more about tech ethics.

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