Sociotechnical Analysis - Project Greenlight

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I. INTRODUCTION TO THE SOCIOTECHNICAL SYSTEM

Security cameras are becoming more and more popular in today's society. You will find them virtually wherever you go, whether it be retail stores, restaurants, schools, apartment complexes, banks, or elevators, it is a guarantee that you will spot the gleam of a camera watching you. Furthermore, there are red-light cameras. These cameras are set up on stoplights and are programmed to monitor intersections while taking photos of cars license plates that happen to run red lights. This type of automation makes 24/7 surveillance a breeze, whilst not having to pay police officers to do such a task.

Project Greenlight, or PGL, is a network of outdoor and indoor surveillance cameras, arranged across higher crime areas of Detroit. These cameras are distinguished by a constant flashing green light. They are also capable of facial recognition, and license plate monitoring. Project Greenlight first came about in 2016 after the Detroit Police Department observed that 25% of violent crime in the city occurred within 500 feet of gas stations (Urban et al., 2019). The Detroit Police Department subsequently gathered risk modeling data which indicated that gas stations were at the greatest risk for violent crime to occur. A partnership formed between the City of Detroit, local businesses, and community groups to put into place a surveillance network. Initially, there were 8 businesses involved with PGL, now there are over 600 in the program.

Some of the stakeholders involved with this system are Comcast, Guardian Alarm Company, Genetec, the FBI, the DHS, DTE Energy, the Downtown Detroit Partnership, Gilbert and Ilitich Organizations, and the various local businesses that agreed to Project Green Light. The social actors involved are the Detroit Police Department, the Detroit City Government, and local community groups. Project Greenlight is used to identify criminals as well as preventing crime through widespread video surveillance. Regular citizens in Detroit know what it means

when they see a bright green flashing light. The criminals know this as well and tend to avoid those areas. Detroit is one of the first cities in America to implement a project like this. Many other places in America like San Francisco have just outright banned facial recognition cameras and technology. Therefore, Detroit seems to be the trial grounds for what could eventually become the new normal.

II. ANALYSIS OF WHAT DECISIONS ARE BEING AUTOMATED BY THE SYSTEM

The main decision that is being automated by Project Greenlight is reducing crime via camera surveillance. Let's walk through a hypothetical situation. A person walks up to the cashier in a minimart, pulls out a gun, and demands that the cashier hands over the cash. The cashier obliges because his minimum wage job is nothing to get shot over. After the robber leaves, the cashier calls the police so that they can come to gather evidence and try to locate and apprehend the suspect. This is how the vast majority of cities in America handle crime. Project Greenlight aims to alter this method by using their surveillance cameras in order to respond faster or identify the suspect more easily.

A technological affordance is, "a behavior or action of someone that is allowed or provoked by a technology" (McCoy & Terrell, 2020). One affordance regarding the main automated decision is the constant flashing green lights present at every business involved in the program. This affordance allows citizens to recognize that they are obviously in a green light corridor and they are henceforth provoked to act according and abide by the law. A technological limitation is, "a behavior or action of someone that is prohibited or prevented by a technology" (McCoy & Terrell, 2020). Some limitations regarding the main automated decision are technical

malfunctions, power outages, and internet inconsistencies. These three limitations effectively deconstruct the capability of the cameras by rendering them useless.

There are a handful of supplemental decisions that are also being automated. One supplemental decision being automated is that citizens with a minor warrant for not being able to pay their parking ticket would be inadvertently monitored, recognized by facial recognition, and possibly charged for just showing up on a PGL camera. An affordance of this supplemental decision would be that it allows the Detroit Police Department as well as the City Government to monitor citizens 24/7 without their consent. This type of intrusive surveillance on communities is borderline illegal. A limitation of this supplemental decision would be that the facial recognition features of the cameras are often inaccurate, more so on people of color. These inaccurate facial recognition capabilities can sometimes lead to false identifications as well as false arrests. Another supplemental decision being automated is that the Detroit police department is allowed to hand over their surveillance data to immigration authorities as well as the FBI, amongst other companies. In most cases, this is essentially free data harvesting for these companies. Alternatively, the DPD and city government of Detroit could sell this data off to private companies for a profit. There are far too many things that the citizens are unaware of when it comes to how this surveillance data is utilized. It is important to analyze the decisions being automated by the system, along with their respective technological affordances and limitations.

III. HISTORY OF THE SYSTEM

Detroit, Michigan is notoriously known as a city with one of the highest crime rates in The United States. Detroit's rate of 1,965 violent crimes per 100,000 residents placed it at the top of the list among cities with more than 100,000 residents (MacDonald & Hunter, 2020). These statistics are what motivated Project Greenlight to come into existence, in order to try and curb the crime. The results of PGL so far have been varied. According to the Detroit Police Chief James Craig, violent crime reduced by 48%, and car-jackings decreased by 40% in project greenlight areas. Chief James Craig also stated that there have been no studies comparing project greenlight locations to non-PGL locations, so these statistics don't really mean much. The number of homicides in Detroit dropped from 2016-2018, then rose again in 2019 (Wikipedia, 2020). One decision that shaped the development of the PGL system is that the government requires businesses who want a part of the program to pay for the installation of the cameras, as well as pay monthly and yearly fees to the DPD and government. The officials in charge of the program are basically making their service a "subscription fee," by essentially allowing different subscription tiers based on what level of monitoring their clients require. The decisions I outlined in part two were:

1. The main decision that is being automated by Project Greenlight is reducing crime via camera surveillance.
2. One supplemental decision being automated is that citizens with a minor warrant for not being able to pay their parking ticket would be inadvertently monitored, recognized by facial recognition, and possibly charged for just showing up on a PGL camera.
3. Another supplemental decision being automated is that the Detroit police department is allowed to hand over their surveillance data to immigration authorities as well as the FBI, amongst other companies.

Before automation, these three decisions were made in different fashions. For number one, police officers reduce crime through their typical ways of either self-surveillance (sitting in their car by a high crime area) or getting called to handle situations. There was really no comparable way that number two was enforced before the cameras and facial recognition sprung into existence. Possibly, a cop might pull someone over for speeding, then run the passenger's information and realize they have warrant/s. Regarding number three, this kind of data farming has always been interchanging. It just wasn't rich, photo data before PGL.

IV. THE DESIRED OUTCOME OF THE SYSTEM

Project Greenlight's main goal was to provide an advanced, effective, technological fix in order to positively boost public safety in Detroit by surveilling high crime areas. The projected outcome of this system was that it would significantly reduce crime rates in Detroit, whilst making the business owners, and citizens feel safer and happier when going about their daily lives. PGL was forecasted to be a network of cameras that are connected to the Detroit Police Departments, Real-Time Crime Center (RTCC). The RTCC is a room full of policemen and analysts who are monitoring live camera feeds all over Detroit. Stakeholders are, “people or entities who have something to gain or lose or are somehow affected by a situation” (McCoy & Terrell, 2020). The community as a whole is a stakeholder, and they were excited to see if this system would actually decrease crime within the city. The Detroit PD was hopeful that this addition to their arsenal would make their jobs much easier, net them more money, and make the city a safer place. The project hoped to deter crime by putting green flashing lights by all participating locations. Also, there would be signs on business fronts, notifying customers that this business was part of PGL.

I believe that it was logical to assume that obvious video surveillance would deter crime from the area. The mutual goal of all the stakeholders was to create a safer community. Not all members of the community agreed to this project. Some believed it to be an invasion of privacy. Others like Tawana Petty argued that the money would be better spent rebuilding social programs and social infrastructure by putting money back into the community. There were also a fair amount of citizens that supported it. Denise Roberts, a citizen of Detroit, summed up the situation by saying, “When people wanna act a fool, they gonna act a fool regardless”(Gross, 2018).

V. ADDITIONAL OUTCOMES DEVELOPED FROM THE USE OF THE SYSTEM

The rollout of Project Green Light was laden with unintended consequences that differed from the original goal of the system. The accuracy of the projected outcome has been somewhat mixed since not enough data has been collected on the project, as I stated in section III. Some areas have seen decreases in overall crime, some areas have increased crime rates, and some have stayed the same. One unintended consequence was the addition of facial recognition technology software to the camera monitoring system in late 2017. The city hired DataWorks Plus to implement this, on a three-year contract worth 1,040,000 in city funds (Urban et al., 2019). Now, the PGL cameras can recognize almost every citizen that's face is captured on one of the cameras. This can result in inadvertent arrests as I stated as a supplemental decision in part II. Another unintended consequence is that the facial recognition tools are somewhat ineffective, and tend to misrecognize people, especially people of color. Facial recognition software's misrecognition has been an issue brought to national attention over the years. This misrecognition can lead to false arrests, so this is an important problem that needs to be resolved.

Sometimes it is easier to understand things when using an analogy. In this case, Project Green Light is a black box. A black box is a, “device, system or object which can be viewed in terms of inputs and outputs, without any knowledge of its internal workings” (Wikipedia, 2020). The public knows the inputs and outputs of PGL. The inputs are the raw data footage which is collected from the surveillance cameras. The outputs are people getting arrested usually because they were either identified through the footage by an analyst of the FR program. However, the majority of the inner workings of this program remain a mystery to the public. How the footage is exactly reviewed and processed is a mystery to the public. Also, the extent of what this data is being used for is unknown to the public. Lack of transparency, wrongful arrests, and a rise in the cost for businesses to participate are all indicators of how Project Green Light is a black box.

VI. ANALYSIS OF THE HUMAN ACTORS INVOLVED

The human actors with the most power in this system are without a doubt the Mayor, and the people employed at the Detroit city government in charge of PGL. The mayor and politicians have the most power over PGL because they can re-allocate funding to certain programs, as well as accepting lobbying payments from companies who want to be a part of PGL or access to the data that is collected. The Detroit PD also has a comparably large amount of power in this system. They now have the capability to monitor 600+ facial recognition capable cameras from an app on their phones. They have a 24/7 surveillance system that is capable of doing a large portion of their jobs for them. The community are the actors with the least power. Sure, there are community activist groups that are formed to have a say in situations like these. In my eyes, the government usually only adds a community group to a borderline unethical project because it makes them look less authoritarian and more civil. I believe the people in charge of PGL are

violating basic human rights, by implementing a massive facial recognition surveillance system without full public approval. The power dynamics are rather easy to see within Project Green Light. The higher up city and police officials are at the top, while the members of the community are at the bottom.

People of color are at even more of a disadvantage when it comes to being monitored by PGL. This is because facial recognition technology literally has a bias encompassed within the algorithms that make it falsely identify people, or not be able to identify them at all. It is pretty wild to me that even facial recognition programs can have racist tendencies. I believe there is an inherent bias in this technology due to the creators of the algorithms being racially biased. I believe that it is the programmers who code these instances on purpose. I mean how could facial recognition software have such inadequacies without being programmed to do so? A study by the United States Government actually found that the best facial recognition algorithms still misidentify people of color at 5-10 times the rate of whites (Simonite, 2019). The full capabilities of Facial Recognition are just not there yet, and it is too dangerous to continue using an underdeveloped, overly intrusive feature within PGL as well as across the country.

VII. USEFULNESS OF A SOCIOTECHNICAL APPROACH

The mutual shaping lense is where we look at things like the social and technical shape each other, and they are not mutually exclusive (McCoy & Terrell, 2020). This logic also applies to the concept of something being sociotechnical. This paper on Project GreenLight is sociotechnical in nature because I am analyzing the links and interconnections between people and technology involved within the PGL system. A sociotechnical approach is, “one which seeks to identify the dynamics between technology and the social, professional, and cultural

environment in which it is used" (Li, 2010). Using a sociotechnical approach on this paper was quite effective in comparison to the other lenses we discussed in class. I think the mutual shaping lense is the most used and logical thinking approach amongst people. My analysis on PGL is sociotechnical because, in order to understand the system, you must be able to realize how the human actors and stakeholders intertwine with the technology at play. Doing research and analyzing Project Green Light through the form of seven questions really opened my eyes to a lot of issues that I was unaware of before this paper. Overall I am glad that I had the opportunity to complete this sociotechnical analysis and I look forward to utilizing the knowledge I've gained from this course as I move on into the future.

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