

Group Design Tool Storytelling

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Considering the impacts that technology can have on a ***broad set of direct and indirect stakeholders*** is an important aspect of the ethical design of technology. It helps to identify interesting possibilities for design, helps to build empathy for those stakeholders, and also helps to uncover and anticipate important ethical issues that can arise when technology is deployed in society. When designing with ethics in mind, it is also useful and important to consider how a particular technology can have implications for certain ***human values and/or principles***. Those human values often come into tension with one another. You can use visualizations to represent the relationship between stakeholders, values/principles, and resulting value tensions in a ***Value Map***. You can use storytelling to explore and highlight the various nuances that exist within a value tension and build empathy with stakeholders. Value Maps can be used as a basis for ethical design decision-making.

Design challenge:

You are part of a team helping to design a highly automated vehicle that requires varying degrees of driver supervision/surveillance to operate safely, and also that enables a high level of in-cabin connectivity (e.g. passengers can connect devices to car and control in-cabin entertainment system). In order to help improve safety, various *in-cabin sensors and processing systems* have been installed in the vehicle, including HD video cameras (driver, dashboard, front/rear cabin), occupant emotion systems (e.g. systems to analyze the emotional state of occupants), 3-D lidar (front/rear cabin), Wi-Fi connectivity, and microphones.

These sensors have also been identified as technologies that can enable the realization of a new vehicle concept (and potential revenue stream). The concept reimagines the car as a “wellness space” that could support the physical and mental health of drivers and passengers. The concept of a wellness space includes scenarios in which *drivers and passengers* are offered highly personalized exercise and meditation routines that are monitored in real time, as well as personalized entertainment, education, connections to friends, family, and colleagues, and retail experiences. Management has asked your team to analyze the ethical risks and opportunities associated with its “driver surveillance” and “wellness space” in-cabin sensing concepts.

Section 1 – Identify who is impacted in this scenario.

1. Driver
2. Passenger
3. Driver and Passenger’s family
4. Car Manufacturers
5. Pedestrian
6. Legislator
7. Cybersecurity Experts
8. Government Regulators

9. Insurance Companies (Health, Car, and Life)
10. Law Enforcement Agencies
11. Data Analyst/ AI Trainers
12. Vehicle Maintenance and Service Providers
13. In-Cabin Sensor Suppliers
14. Entertainment Providers (eg Apple Carplay, Android, etc.)
15. Wellness Program Designers
16. Doctors or therapists
17. Urban wildlife
18. Behavioral Scientists
19. Local Businesses
20. User Experience (UX) Researchers
21. Highway engineering
22. Fleet Operators
23. urban planner
24. Public Transit Authorities
25. Environmental Consultants
26. Content Creators (Media and Entertainment)
27. Travel and Tourism Companies
28. Car Rental and Sharing Services
29. Emergency Services
30. Fire and Rescue Service

Section 2 – Select five stakeholders from (1) and identify two to three values/principles that are applicable to *each* of those stakeholders in this scenario.

1- Insurance company

- Risk Assessment: Insurance companies value accurate risk assessment derived from data collected by in-cabin sensors and wellness monitoring systems. This data can enhance their ability to evaluate policyholders' health and lifestyle, allowing for tailored policy rates and coverage options.
- Data Privacy: These companies prioritize data privacy, ensuring that personal health and behavior information is handled with care to comply with regulations and maintain consumer trust. A breach of sensitive information could severely impact their reputation and customer relationships.
- Preventive Care and Wellness Incentives: They also value the promotion of preventive care and healthy behaviors among policyholders. By utilizing wellness data, insurance companies can incentivize healthy choices that not

only improve policyholders' well-being but also help reduce overall claims and costs associated with poor health outcomes.

2- Driver

- **Privacy:** The driver values the protection of their personal data from in-cabin sensors (e.g., HD video cameras, emotion analysis systems). Constant surveillance, even for safety reasons, threatens their ability to control their personal information.
- **Safety:** On the other hand, the driver also values safety, which the sensors aim to enhance by monitoring their emotional state and attentiveness. Ensuring safe operation without risking privacy is a core tension.
- **Cognitive Load:** The driver values minimal cognitive load while driving. The presence of multiple monitoring systems, alerts, and notifications can overwhelm the driver, causing distractions and reducing focus on the road. Balancing useful features with ease of use is crucial to avoid mental overload

3- Pedestrian

- **Safety:** Pedestrians prioritize their safety in relation to automated vehicles. They expect the vehicle to recognize their presence, react appropriately, and ensure safe interactions. Pedestrians want to know what the vehicle is doing. Features like visual signals or sound alerts can help them feel safer and more informed about their interactions with the vehicle.
- **Data Privacy:** Pedestrians should have assurance that their personal data, including images or behavioral information captured by the vehicle's cameras and sensors, is protected. Transparent policies on data collection and usage are crucial to ensure that pedestrian information is not misused or stored without consent.
- **Environmental Friendliness:** Pedestrians appreciate cars that are environmentally friendly and produce less pollution. Automated vehicles that use electric powertrains or efficient energy management reduce air and noise pollution, contributing to a healthier environment and enhancing the quality of life for those who walk and spend time outdoors.

4- Car Manufacturers

- **Profitability:** Car manufacturers are motivated by profitability, seeking to maximize revenue through innovative features like in-cabin wellness services and enhanced connectivity.

- **User Satisfaction:** They also value user satisfaction, as they need to ensure that the features they implement align with consumer preferences and enhance the overall driving and passenger experience.
- **Sustainability:** In a broader sense, manufacturers are also increasingly driven by sustainability values, ensuring that the technology aligns with environmental goals, such as reducing the ecological footprint of their vehicles.

5- Government Regulators

- **Public Safety:** Government regulators prioritize ensuring that automated vehicles and in-cabin technologies comply with safety standards to protect the public.
- **Data Protection:** They also emphasize the protection of personal data, ensuring that technologies abide by privacy laws and data protection regulations like GDPR.
- **Accountability:** Regulators value accountability, ensuring that if something goes wrong (e.g., data misuse, accidents), there are clear lines of responsibility and avenues for legal recourse.

Section 3 – Identify five Value Tensions.

- **Driver Safety Versus Pedestrian Privacy:**
Driver safety relies on monitoring emotional states, attentiveness, and the surrounding environment through surveillance and cameras. While this data collection enhances safety, it can create tension with pedestrian privacy, as pedestrians may feel that their presence and behaviours are being recorded without their consent.
- **Risk assessment for insurance companies versus driver privacy**
The tension between risk assessment for insurance companies and driver privacy centers on the collection and use of in-cabin data. Insurance companies might want access to detailed driver behavior, emotional state, and attention data to better assess risk and improve accident liability judgments. However, drivers may feel their privacy is compromised by constant surveillance. In addition, this data could be used against drivers. For instance, insurance companies might raise insurance or deny coverage if data reveal attention issues.
- **Profitability for car manufacturers versus public safety for the government**
The tension between profitability for car manufacturers and public safety for the government emerges in the deployment of highly automated vehicles. The car manufacturers aim to maximise profits by accelerating the development and sale of

highly automated vehicles with advanced in-cabin features. Manufacturers prioritize cost-efficient and expedited product release, which may lead to compromises in safety testing and quality assurance. In contrast, the government's primary concern is ensuring public safety through rigorous safety standards and thorough testing. The rigorous testing and high safety standards required by the government might take too long or increase costs.

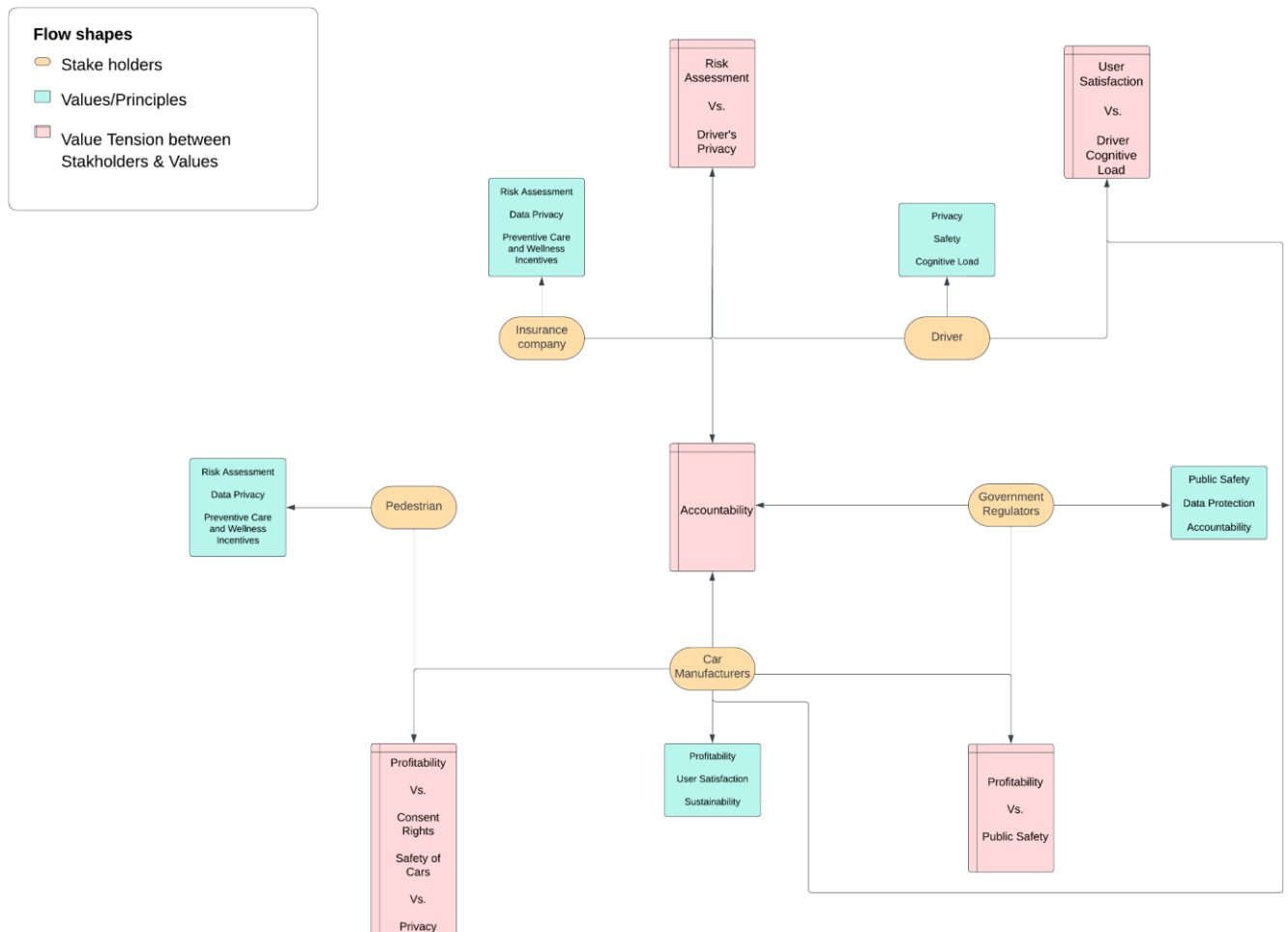
- **User Satisfaction for Car Manufacturer Versus Cognitive Load on Driver:**

Car manufacturers strive to enhance user satisfaction by integrating advanced infotainment, wellness, and connectivity systems into vehicles. These features, from touchscreens to wellness monitoring, aim to improve the driving experience. However, this innovation can increase driver cognitive load—the mental effort required to process information. With more in-cabin distractions, such as adjusting settings or responding to alerts, drivers may lose focus on the road, reducing reaction times in critical situations.

- **Accountability between car manufacturer, government, and driver**

The core tension around accountability between car manufacturers, the government, and drivers lies in each party seeking to minimize liability, as being held accountable carries significant financial and legal consequences. Manufacturers argue that responsibility falls on drivers to monitor the vehicle and take control when necessary. Drivers may assert that the car's automated systems should perform safely without constant supervision. Additionally, the government plays a role in setting regulations and enforcing liability paragon. Any assignment of liability comes with potential costs and legal challenges for all parties involved.

Section 4 – Build your Value Map Visualization.



LucidChart Link: https://lucid.app/lucidchart/4f081dc2-bdcc-4472-b801-456523357272/edit?viewport_loc=-842%2C-688%2C4236%2C2188%2C0_0&invitationId=inv_78a42265-7276-4ee0-a023-c260a1c559e3

Section 5 – Write a short story.

Emma always found the in-cabin features of her new AutoCar convenient. It monitored her mood, adjusting the car's interior lighting to match her emotional state, and even offered calming music or meditation suggestions when she appeared stressed. The car's sensors could detect if she was getting tired, gently nudging her to take a break when needed. It made her feel safe, even on long commutes.

One afternoon, Emma received an email from Max, her insurance provider's claims manager. "We've detected a potential high-risk pattern in your driving behavior," it read. Confused, Emma read on. "According to the in-cabin sensors of your vehicle, the emotional analysis data shows frequent episodes of high stress while driving, especially during work commutes. This raises concerns about potential accidents."

Emma was taken aback. She hadn't realized that the emotion-tracking feature—meant to improve her well-being—was feeding directly into her insurance company's risk assessment algorithm. Max explained that based on this data, her insurance premium would be increasing by 20%. The data, he said, showed her as a higher risk than most other drivers.

Max's role was straightforward. The more granular the data, the more accurate the risk models his team could build. He could determine not just whether Emma was following traffic laws, but whether she was driving while tired, distracted, or emotionally overwhelmed—all key indicators of risk for his company.

Max believed this approach led to fairer insurance rates. "It's in everyone's best interest," he often said in meetings. "We can reward safe drivers with lower premiums and offer corrective interventions to risky drivers before accidents happen."

But Emma felt differently. She hadn't agreed to have her stress levels monitored by anyone but the car's AI, which she thought only adjusted her comfort settings. She had never been in an accident, nor had she violated any traffic rules. It felt invasive to know that her emotions—something private—were being used to determine how much she should pay for insurance. She wasn't reckless, just stressed from work. The car was supposed to help her relax, not act as a surveillance tool for her insurance company.

The next day, Emma visited the dealership where she'd purchased CarAuto. "I didn't sign up for my insurance company to have access to this kind of data," she said, frustrated. The representative explained that it was part of a broader shift in how insurance companies assessed driver behavior. The sensors were designed not just for her safety, but for the overall safety ecosystem: reducing claims, preventing accidents, and promoting responsible driving.

"Isn't that fair?" the representative asked. "If you're driving under stress frequently, you're more likely to make mistakes. Your insurance reflects that risk."

Emma didn't see it that way. "But stress is personal. Maybe I'm stressed because of work or family issues—it doesn't mean I'm a bad driver. Why should I be penalized for something the car's AI is supposed to help me manage?"

Max, on the other hand, couldn't understand why drivers like Emma were upset. He thought of it like health insurance—just as poor health choices could lead to higher premiums, driving habits that indicated risk should come with higher costs. "We're just using the data to keep everyone safe," he told a colleague, as he adjusted Emma's new premium in the system. "If someone's driving under emotional distress, it's not just about them—it's about everyone else on the road."

This tension illustrates a larger social concern about how the same technologies that can improve safety and wellness can also be used for monitoring and controlling behavior in ways that may feel invasive or exploitative. The insurance company's focus on risk reduction and financial efficiency clashes with the driver's need for autonomy and privacy, particularly when it comes to sensitive data like emotional states. Emma didn't sign up to have her personal life scrutinized—she bought a car to help her, not to expose her vulnerabilities.

The story underscores the tension: data gathered for well-being can be repurposed for surveillance, and what is perceived as "fair" by one stakeholder (the insurance company) may feel like an invasion of privacy to another (the driver). As technology becomes more embedded in everyday life, balancing these competing values—between maximizing safety and protecting privacy—will be critical.