Rekeningrijden Final

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Impact on society

What impact is expected from your technology?

What is exactly the problem? Is it really a problem? Are you sure?

To encounter the climate change, the member states of the European Union have decided to introduce road pricing, a vechicle has to pay a price per km at a certain place, date, and time.

Are you sure that this technology is solving the RIGHT problem?

Because this way people are more conscious about to when they go somewhere by car.

How is this technology going to solve the problem?

With the road pricing your intinerary is measured and the driver has to pay a price per km at a certain place, date, and time.

What negative effects do you expect from this technology?

Some people may not like that they have to pay extra for driving.

In what way is this technology contributing to a world you want to live in?

With the road pricing some people may use the car less often, and because of this you have less CO2 emissions.

Now that you have thought hard about the impact of this technology on society (by filling out the questions above), what improvements would you like to make to the technology? List them below.

No.

Hateful and criminal actors

What can bad actors do with your technology?

In which way can the technology be used to break the law or avoid the consequences of breaking the law?

The technology can be abused by removing or manipulating the device that transmits GPS coordinates. A better approach would be a design with devices that recognize license plates along the roads. Users have less influence on this.

Can fakers, thieves or scammers abuse the technology?

Administrators could abuse the Interpol dashboard to invade the users privacy. Regular users can hardly abuse the system since this is only a billing system.

Can the technology be used against certain (ethnic) groups or (social) classes?

The system cannot make any difference between groups or classes.

In which way can bad actors use this technology to pit certain groups against each other? These groups can be, but are not constrained to, ethnic, social, political or religious groups.

It is impossible with this system for bad actors to pit certain groups against each other. The only way this can be done is for administrators to charge one group more than another.

How could bad actors use this technology to subvert or attack the truth?

GPS trackers could be modified in a way that the system thinks the driver drove less (or more) than the driver actually did.

Now that you have thought hard about how bad actors can impact this technology, what improvements would you like to make? List them below.

I would replace the GPS tracker with roadside license plate recognition, but this is not what the Product Owner wants. We did not change the design of the system.

Privacy

Are you considering the privacy & personal data of the users of your technology?

Does the technology register personal data? If yes, what personal data?

Yes, Road Pricing does register personal data. This personal data contains users, their vehicles and information about the vehicles. Additionally, the system tracks a users driving history such as timestamps, the vehicle used and GPS coordinates. The system uses this data to calculate billings for specific users.

Do you think the technology invades the privacy of the stakeholders? If yes, in what way?

In a way this system does actually invade the users privacy, because the system tracks every vehicle that is on the road, and constantly monitors the location of this vehicle. However, the system should be designed in such a way that only the concerning user has access to this information. The management dashboard of the government cant access this information, and neither can the Interpol portal. There is one exclusion to this: Interpol can retrieve location data of a vehicle that is reported as stolen.
This could be abused in a way that Interpol just reports any car they want to monitor as stolen. Interpol then receives information about this vehicle. That is most definitely a violation of privacy.
So no, as long as correctly used, I do not think this system invades the users privacy. There is no way for anybody to retrieve sensitive information except for the user itself.

Is the technology is compliant with prevailing privacy and data protection law? Can you indicate why?

The system is used in Europe. That means the system and data processing has to be GDPR compliant. An important part of the GDPR is that the user has the right to be forgotten. In addition, Road Pricing is obligated to track when, where and what data has been processed by the system. This way, when a user requests to be completely removed, this log can be used to supervise that all of the users data has been removed. This also means the system needs a possibility and procedure for users to completely their data, unless this data is proven critical.

The owner of the Road Pricing system is an authority. This means the authority is mandatory to assign a Data Protection Officer. This DPO supervises that data is processed, handled and stored correctly and legally. Also, the users need to be notified before any of their data will be processed. Users have to accept an agreement which describes the processing,

managing and storing of their personal data.

The administrator of Road Pricing is fully responsible for correctly processing, handling and storing this data. This means Road Pricing also needs to perform the necessary risk assessments.
Finally, Road Pricing is obligated to report data leaks to Belgiums Data Protection Authority.

The system is not yet finished. Once finished, the software must comply to all mentioned requirements. For now, no law violations are visible yet.

Does the technology mitigate privacy and data protection risks/ concerns (privacy by design)? Please indicate how.

The system was designed in such a way that only the concerning user has access to this information. In addition, the system was designed in such a way that databases are not directly accessible through the internet. The relevant services handle the databases. This is protected using an authorization system.

In which way can you imagine a future impact of the collection of personal data?

A future impact of Road Pricing collecting data will be that stolen vehicles will be way easier to track down. Every vehicle on the road will be constantly monitored, so stolen vehicles will be found very quick.
As long as the system complies to the GDPR and is used correctly, there will not be another big impact.

Now that you have thought hard about privacy and data protection, what improvements would you like to make? List them below.

The design stays the same, but the mentioned requirements to comply to the GDPR will be kept in mind.

Human values

How does the technology affect your human values?

How is the identity of the (intended) users affected by the technology?

If the road pricing becomes mandatory, it may conflict with the views of citizens:

Some citizens may value privacy a lot and do not want their car to be constantly tracked.

Some citizens may believe the technology does not have (significant enough) impact on climate change for the pros to outweigh the cons.

How does the technology influence the users' autonomy?

Every driver will become dependent of the technology if the road pricing system becomes mandatory.

What is the effect of the technology on the health and/or well-being of users?

The road pricing may motivate users to use their cars less and walk/use a bicycle which is healthier.

Now that you have thought hard about the impact of your technology on human values, what improvements would you like to make to the technology? List them below.

We discussed how to best handle data access so governments cannot abuse the application to track citizens. Governments will be able to view invoices, but only the drivers can see their routes in detail.

Stakeholders
Have you considered all stakeholders?

Who are the main users/targetgroups/stakeholders for this technology? Think about the intended context by answering these questions.

Name of the stakeholder
Belgian citizen with car

How is this stakeholder affected?
The person must pay per car ride.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Interpol

How is this stakeholder affected?
Interpol can track cars with the technology.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Belgian government

How is this stakeholder affected?
The goverment is in charge of the pricing.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Foreign governments

How is this stakeholder affected?
Because they have to work with the road pricing too.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Did you consider all stakeholders, even the ones that might not be a user or target group, but still might be of interest?

Name of the stakeholder
-

How is this stakeholder affected?
-

Did you consult the stakeholder?
No

Are you going to take this stakeholder into account?
No

Now that you have thought hard about all stakeholders, what improvements would you like to make? List them below.
No.

Data

Is data in your technology properly used?

Are you familiar with the fundamental shortcomings and pitfalls of data and do you take this sufficiently into account in the technology?

Yes, route tracking may not be fully accurate due to signal strength and because the data is only sent every x seconds. We do take this fact into account when creating the billing service.

How does the technology organize continuous improvement when it comes to the use of data?

New routes may become more accurate over time as infrastructure and tracking technology improves, this won't be a problem with our current database structure.

How will the technology keep the insights that it identifies with data sustainable over time?

Route data may become outdated as roads change over time due to construction. The data is not sold to a third party but is partially accessible to governments.

In what way do you consider the fact that data is collected from the users?

Data is used to generate invoices, all profits go to the respective member states.

Now that you have thought hard about the impact of data on this technology, what improvements would you like to make? List them below.

Not at the moment but we may include warnings about the accuracy of legacy data.

Inclusivity
Is your technology fair for everyone?

Will everyone have access to the technology?
Everybody who is a Belgian citizen who owns a car will have acces to this system.

Does this technology have a built-in bias?
No, all actions are based on real world movements.

Does this technology make automatic decisions and how do you account for them?
All pricing desicions are made by humans. The systems only combine these listings with real time data to calculate receipts

Is everyone benefitting from the technology or only a a small group? Do you see this as a problem? Why/why not?
Only people who are driving less than average will benefit our new technology. But the new system is a more fair system based on driven kms instead of only the type of car you own.

Does the team that creates the technology represent the diversity of our society?
We cannot assure that we as humans will not have individual influence on the system. only that we try our best not to.

Now that you have thought hard about the inclusivity of the technology, what improvements would you like to make? List them below.
Not yet.

Transparency

Are you transparent about how your technology works?

Is it explained to the users/stakeholders how the technology works and how the business model works?

We cannot assure that we as humans will not have individual influence on the system. only that we try our best not to.

If the technology makes an (algorithmic) decision, is it explained to the users/stakeholders how the decision was reached?

We cannot assure that we as humans will not have individual influence on the system. only that we try our best not to.

Is it possible to file a complaint or ask questions/get answers about this technology?

Users can file a complaint on wrong itineraries and or pricings.

Is the technology (company) clear about possible negative consequences or shortcomings of the technology?

People will know that they might end up paying more than before.

Now that you have thought hard about the transparency of this technology, what improvements would you like to make? List them below.

No.

Sustainability

Is your technology environmentally sustainable?

In what way is the direct and indirect energy use of this technology taken into account?

The development of this product will involve producing tracking boxes that can be placed in cars. Thus, the lifespan would ideally be the same as the lifespan of a car. If you compare this to a phone, which has an average lifespan of 4.7 years and is full of sensors and internet connectivity, this seems like a very reasonable lifespan.

Do you think alternative materials could have been considered in the technology?

The tracking boxes will get their power from the power that is generated by the cars using them. The servers can be made more green by carefully choosing a datacenter with a good environmental rating / grade.

Do you think the lifespan of the technology is realistic?

No, the emissions caused by our technology will be less than the emissions of the current infrastructure situation, since our technology will ideally reduce the number of traffic jams and driven kilometres.

What is the hidden impact of the technology in the whole chain?

This question has not been answered yet.

Now that you have thought hard about the sustainability of this technology, what improvements would you like to make? List them below.

There are no new questions.

Future

Did you consider future impact?

What could possibly happen with this technology in the future?

This question has not been answered yet.

Sketch a or some future scenario (s) (20-50 years up front) regarding the technology with the help of storytelling. Start with at least one utopian scenario.

The road pricing methodology makes people more conscious about the price and environmental impact that is attached to driving cars. Because of this, people utilize greener methods of transportation and the climate change is countered. Traffic jams also happen rarely and the traffic now flows faster and safer.

Sketch a or some future scenario (s) (20-50 years up front) regarding the technology with the help of storytelling. Start with at least one dystopian scenario.

Because of climate change, driving cars is now very expensive. Thus, most people choose to utilize public transport. Green transportation is now crowded and damaging transportation is too expensive for the average person. Most people cannot afford to go out of town anymore.

Would you like to live in one of this scenario's? Why? Why not?

Yes, we would love to earn money by driving in reverse.

What happens if the technology (which you have thought of as ethically well-considered) is bought or taken over by another party?

The technology should always be in control by the government, because the technology controls how we as citizens move ourselves around the country.

Impact Improvement: Now that you have thought hard about the future impact of the technology, what improvements would you like to make? List them below.

We made sure that driving in reverse is also billed.