Sioux parking spot system

This analysis focuses on the Parking Spot System, a project proposed by Sioux specifically for third-semester Software Engineering students at Fontys. The system is designed as a web application that manages employees meetings and monitors guests & employee parking spaces.

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Context of use: Education
Level of education: Bachelor

Impact on society
What impact is expected from your technology?

This category is only partial filled.

What is exactly the problem? Is it really a problem? Are you sure?
The goal of our app is to enhance the appointment experience at Sioux for all involved parties. Firstly, the secretary's workload is improved with an efficient appointment management system. Secondly, Sioux employees enjoy the convenience of an automated schedule and real-time notifications upon clients' arrival. Lastly, guests benefit from the app by receiving information about available parking spaces. These features were designed to address the users' concerns: simplifying appointment creation (for secretaries and clients), monitoring available parking spots for a pleasant experience (for clients), and ensuring punctuality at meetings (for employees).

Are you sure that this technology is solving the RIGHT problem?
Indeed, we are confident that our technology addresses the right issue. To reach this conclusion, we employed the Five Whys technique to analyze the primary problem: developing an efficient management system for guests meetings and monitoring the dedicated parking spaces.

How is this technology going to solve the problem?
Our technology will offer a management system for secretaries to track appointments and a smart parking system to keep employees informed about guests arrivals.

What negative effects do you expect from this technology?
A potential drawback of the technology is that it may limit parking spaces to visitors with appointments only. Additionally, visitors without appointments who cannot find available parking won't be redirected to the next available lot, as we are unable to send the location to them.

In what way is this technology contributing to a world you want to live in?
This technology not only saves time but also enhances the experience by providing a smooth process for both guests and employees.

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.

This question has not been answered yet.

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?
Under specific conditions, our system could potentially be exploited for illegal activities. For instance, a hacker might access and compromise clients' private information or manipulate the secretary panel to create false appointments or alter existing ones. Recognizing the potential harm and inconvenience this could cause for Sioux's clients, we have implemented security measures to safeguard sensitive data. These include encryption, backup options, and the utilization of end-to-end encrypted platforms whenever possible.

Can fakers, thieves or scammers abuse the technology?
Our technology can be vulnerable to malicious users who may use it to carry out unauthorized actions such as editing or deleting existing appointments, as well as creating fake ones. Furthermore, there is a risk of personal data theft, including information such as names, phone numbers, email addresses, and license plate numbers. We need to take measures to address these security concerns and ensure the safety and privacy of our users' data.

Can the technology be used against certain (ethnic) groups or (social) classes?
Our technology does not incorporate any features or functions that can be used to discriminate against specific ethnic groups or social classes. We are committed to promoting inclusivity and diversity and ensuring that our technology is accessible to everyone, regardless of their race, ethnicity, or social status.

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.
Our camera only reads the license plate, and the recognition feature can potentially be abused by bad actors. They may use this feature to discriminate against individuals based on their country of origin, which can create social polarization and division. It is important to address these concerns by implementing measures to prevent such discriminatory practices and ensuring that our technology is used for the benefit of society as a whole.

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

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Malicious actors may use fake license plates to gain unauthorized access to the building. Therefore, it is crucial to verify the identity of each visitor upon arrival, regardless of whether they arrive in a vehicle or not. This helps ensure that only authorized individuals are granted access to the building, enhancing the overall security and safety of the premises.

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

One improvement that can increase security is to use a fingerprint scanner .This adds an extra layer of protection against unauthorized access. Regular security audits and vulnerability assessments can also help identify and address security weaknesses. Multi-factor authentication, such as a combination of a fingerprint scan and access code, can further enhance security.

Privacy

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

This category is only partial filled.

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

Indeed, the limitations are evident. Data collection is carried out in compliance with the General Data Protection Regulation (GDPR). The data helps us
identify the visitors and employees in order to provide a
smooth process and also helps us track the availability of the
parking lot.

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

Our technology requires the collection of private data from stakeholders to ensure the security of the premises. However, we understand that some individuals may feel that their privacy is being invaded because we require the license plate information of each guest. It is important to note that this data is collected and stored securely, and is only used for the purpose of identifying guests and notifying the appropriate Sioux employee. We are committed to protecting the privacy and confidentiality of our stakeholders' data and will continue to implement measures to ensure its security.

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

Our technology follows the prevailing privacy and data protection laws, which prioritize the privacy rights of individuals. We collect and process personal data with explicit consent and store and transmit it securely. Individuals have access to and control over their personal data. Companies and organizations should be aware of and comply with privacy and data protection laws to avoid legal consequences and protect individuals' privacy rights.

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

Our technology addresses privacy and data protection risks and concerns in multiple ways. Encryption is utilized to safeguard personal data against unauthorized access or disclosure. Access controls and authentication measures are implemented to guarantee that only authorized individuals have access to personal data.

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

In the future, we may need to address privacy concerns which can be used for manipulative or discriminatory purposes. By storing visitor data for a long time, evidence of their presence can be kept . We can prevent this by limiting data retention periods and being transparent about data collection, use, and storage. This ensures data privacy and security and protects against its misuse.

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

This question has not been answered yet.

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Human values

How does the technology affect your human values?

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

Regarding user impact, the app is highly effective. To prevent ambiguity, it is essential to have clear actor identities: secretaries should be easily reachable via their phone numbers, while employees should be easily accessible to both secretaries and clients. Clients must also provide necessary information to schedule appointments. As our app is tailored for a specific group - Sioux employees and clients - access to user identities is a crucial component of our system.

How does the technology influence the users' autonomy?

Our technology operates differently depending on the stakeholder. Employees should be aware that their email addresses are used by our system to send notifications of visitor arrivals. Guests should also be aware that their data is used only for the intended purpose. Our system aims to automate processes, and reducing user tasks is beneficial.

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

We are not aware of any issues or concerns with our technology. We remain vigilant and committed to addressing any potential issues in the future to ensure optimal performance and security.

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.

Improving the impact of technology on human values involves incorporating ethical principles into the design and development process. Evaluating potential ethical impacts and engaging with diverse stakeholders is also important. Individuals can help by being informed and advocating for ethical practices in the technology industry.

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Stakeholders
Have you considered all stakeholders?

This category is only partial filled.

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

Name of the stakeholder
Secretary

How is this stakeholder affected?
-

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Employee

How is this stakeholder affected?
-

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Guests

How is this stakeholder affected?
-

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?
-

Now that you have thought hard about all stakeholders, what improvements would you like to make? List them below.
To ensure that stakeholder needs and concerns are addressed, we involve them in the design and implementation process and conduct regular evaluations to identify and address any potential negative impacts. Additionally, we provide training and support to ensure effective and efficient use of the technology. We establish clear communication channels and procedures for stakeholders to provide feedback and raise concerns.

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?
Indeed, based on the information provided by the client, the secretary can confirm a visitor's identity. However, if the provided data is incorrect or falsified, it would be impossible to verify the visitor's identity, potentially posing a security risk.

How does the technology organize continuous improvement when it comes to the use of data?
We stay up-to-date with the latest data saving regulations and security trends in the field.

How will the technology keep the insights that it identifies with data sustainable over time?
The technology's data will be periodically backed up.

In what way do you consider the fact that data is collected from the users?
Data collection is necessary for the technology to function properly.

Now that you have thought hard about the impact of data on this technology, what improvements would you like to make? List them below.
Conduct regular privacy and security audits to identify and address potential privacy and data protection risks and vulnerabilities.

Inclusivity

Is your technology fair for everyone?

This category is only partial filled.

Will everyone have access to the technology?

The technology is accessible to everyone who wants to make an appointment at Sioux.

Does this technology have a built-in bias?

The primary objective of our app is to facilitate efficient connections among users based on their specific requirements. However, there could be concerns regarding the storage of certain data, such as license plate numbers. We understand the confidential nature of this information and assure that it will be used solely for identifying visitors and notifying the respective employees with whom the visitors have scheduled meetings.

Does this technology make automatic decisions and how do you account for them?

The technology automatically hides unavailable time slots for meeting with an employee, making the appointment process smoother. It operates on a first-come, first-served .

Is everyone benefitting from the technology or only a a small group? Do you see this as a problem? Why/why not?

The technology benefits everyone who needs it.

Does the team that creates the technology represent the diversity of our society?

Our diverse team, with members from different cultural backgrounds, provides valuable perspectives on our technology.

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

This question has not been answered 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?
Understanding the technology behind the system is crucial. Guests can schedule appointments, which are then saved in the system. Employees are notified about these appointments and receive alerts when guests arrive. The system also allows clients to check the availability of parking spaces.

Since users interact with the app in various ways, it's not necessary to provide a detailed explanation of the entire technology to everyone. However, the secretary, who is in charge of welcoming clients and handling their needs, should be familiar with the entire system. An explanation can be incorporated into the secretary panel.

It's important to emphasize that we will not share any personal information of clients or employees, nor any meeting specifics. This data is confidential and only accessible to the secretary for management purposes.

If the technology makes an (algorithmic) decision, is it explained to the users/stakeholders how the decision was reached?
The technology makes algorithmic decisions, which will be explained in our documentation and discussed with stakeholders.

Is it possible to file a complaint or ask questions/get answers about this technology?
Stakeholders/product owners can ask questions and provide feedback if they believe improvements can be made.

Is the technology (company) clear about possible negative consequences or shortcomings of the technology?
We have discussed potential shortcomings of the technology with our stakeholders, and they are aware of them.

Now that you have thought hard about the transparency of this technology, what improvements would you like to make? List them below.
We can have detailed discussions with stakeholders to address any potential shortcomings of the technology and work together to find solutions, particularly for more serious problems.

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Sustainability
Is your technology environmentally sustainable?

This category is only partial filled.

In what way is the direct and indirect energy use of this technology taken into account?
Although our app is expected to consume a significant
amount of energy like any other software, our Ultrasound sensor system can be able to produce energy using solar panels.

Do you think alternative materials could have been considered in the technology?
Different types of sensors can be used in a parking system, such as ultrasonic, infrared, and cameras. Ultrasonic sensors measure distance, while infrared sensors detect the presence of vehicles. Cameras provide visual representations of the parking lot and can assist with vehicle tracking. We have chosen ultrasonic sensors for our parking system. Ultrasonic sensors are capable of measuring distance and can be used to detect when a vehicle is entering or leaving a parking space.

Do you think the lifespan of the technology is realistic?
The lifespan of technology used in a parking system or meeting management varies based on factors such as equipment quality and maintenance. Typically, parking system technology is designed to be durable and long-lasting, indicating a reasonable lifespan.

What is the hidden impact of the technology in the whole chain?
The use of technology in parking can have unintended consequences on the people and environment around it. For instance, parking technology can lead to increased traffic which contributes to air pollution, and may displace street parking for local businesses and residents. On the appointment management side, it can lead to increased expectations for availability and accessibility. It's crucial to consider and address these potential impacts to ensure the technology benefits everyone involved.

Now that you have thought hard about the sustainability of this technology, what improvements would you like to make? List them below.
This question has not been answered yet.

Future
Did you consider future impact?

This category is only partial filled.

What could possibly happen with this technology in the future?
This kind of system can be implemented in other companies. Because it makes it easier to manage the parking lots and meetings, it can provide a smooth process and a nice experience both for the employees and the clients

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.
In an ideal scenario, the parking system would provide a seamless experience for businesses with guests, but it wouldn't be limited only to them. It would minimize the time guests spend looking for a parking spot by directing them to the nearest available spot and providing information on its location.

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.
In a dystopian scenario, the parking system would become obsolete as all cars are fully operated by artificial intelligence and businesses have adapted to this by providing alternative and more efficient ways of dealing with parking. The technology would no longer serve its purpose and would be rendered useless.

Would you like to live in one of this scenario's? Why? Why not?
It is understandable to prefer the utopian scenario where the parking system would have a positive impact on society by providing a smooth parking process for visitors and businesses. The system would be seen as a valuable asset that enhances the experience of visitors and improves the efficiency of businesses.

What happens if the technology (which you have thought of as ethically well-considered) is bought or taken over by another party?
Improper data protection by the party taking over the system can harm clients.

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.

This question has not been answered yet.