IoT

12cu delivers cloud-based dashboards and visualizes space usage both real-time and historically. This provides (management) information to educational institutions with which they can offer students education more safely and while retaining educational quality in times of COVID.

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Technology Impact Cycle Tool

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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?

On the long run, this technology has positive influence on the problem that students will experience study delay or that they will dropout.

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

Due to the feedback that I am receiving.

How is this technology going to solve the problem?

It's giving certain stakeholders within educational institutions the insights that they're currently missing or guessing. Based on these insights, decision makers are able to support their decision with the information given.

What negative effects do you expect from this technology?

The information is neither 100% true nor false. This makes the information discussable for people being sceptical or that don't agree with the outcome. For example when it puts themself in possible danger in any way.

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

Short term - it contributes to students being able to follow quality and safe education. People. Long term - the insights makes it possible to maintain an organisation strategy based on durability. Reducing impact on Planet.

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.

Best case scenario is that our insights will be the insights the government could make dicisions with regarding COVID and education. Improvements that we would need to make, is to make sure we give the insights they need to achieve this.

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?

This technology could break the law on privacy aspects if the data/ information is used with wrong intentions.

Can fakers, thieves or scammers abuse the technology?

It could create societal unrest if the working processes of the software are not explained well enough to the people being 'measured'.

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

Not that I could think off.

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 could create gaps between certain departments or functions within institutions.

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

The technology can be used to attack the 'not substantianed' truth.

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

No improvements will be made.

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?

No personal data is registered. Only group data.

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

In fact it doesn't. But it can be felt as if it's invades someone's privacy as people are being 'tracked' - but not on a individual level.

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

It is GDPR compliant because we filter out personal identification.

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

The reason we are not using personal information, is to exclude this.

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

If enough data is collected, it is easier to predict instead of to 'track'. AI could become a part of the information being shown at that point.

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

Better information to end users what the impact is of the tracking and why we do this.

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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?

User could experience the information being shown as 'being tracked' while this isn't the case. This could result in the user missing out on the 'bigger' point of the technology: improvement of the core business of the institution.

How does the technology influence the users' autonomy?

In many ways. Choices are being made for users by analyzing their own data so that what they do, can be improved.

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

We would like to think that it improves safety and education quality. Both of these improves health and wellbeing; this is the goal.

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.

I would like to know what end users think of us doing what we do with the technology. Like: what do students think of it? I would like to discuss with them about this.

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
Facility mangement

How is this stakeholder affected?
This group has a need for information and makes choices based upon this information.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
IT

How is this stakeholder affected?
This stakeholders implements and maintains the technology. In some ways, it could be the user too.

Did you consult the stakeholder?
Yes

Are you going to take this stakeholder into account?
Yes

Name of the stakeholder
Education development

How is this stakeholder affected?
Based on our information, education can improve their education.

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
College van bestuur

How is this stakeholder affected?
Based on information, management get insights in how the institution operates

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.

I would like to talk more with management instead of the 'endusers' to see what insights they want

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. The information that is being shown is shown as static but could be perceived different per user. This is why we don't want users to experience the information as single point of truth.

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

This is something that we could work on. Feedback is being collected, but not through fixed processes.

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

By being transparant on how the data is being used and to keep it 1 on 1. No third parties are involved for example.

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

We don't sell the user data. The data being collected in the institution is processed into information for the institution.

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

Non.

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Inclusivity

Is your technology fair for everyone?

Will everyone have access to the technology?

No. Student (endusers) won't have direct access to the information. It's possible to show this to them.

Does this technology have a built-in bias?

Yes. Input is being collected by WiFi only. While theoretically you could use different input technologies to create roughly the same output. Other than that; information is being shown in a certain way. Which leaves it open for perception. Although, the information being shown is considered (for the software it self) as single and only truth.

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

The technology deduplicates devices. This is an automatic decision. Which is needed.

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

Everyone being involved in the main purpose of the instition is benefetting.

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

No. We are a small team and not able to represent this diversity. Also, we are a IT company with focus on what we do. This is why feedback loops are important.

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

More feedback loops and improvements based on the diversity of the insitution.

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?

After implementation of the technology, key users are being given instructions on how to use the software and how it can be used to their advantage.

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

To the users of the software, this is being explained. Also it's explained how the information is being shown and which insights it is giving.

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

Yes. We are in contact with our users on weekly bases where we collect feedback from the users.

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

Not within the software. But in the adoption fase we do clear out how information is being shown and how it should be intepretated.

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

Non.

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Sustainability

Is your technology environmentally sustainable?

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

The technology uses energy that is already being used to serve other goals; like being online. Theoretically, we could use sensors to create the same output. Although, this would use more direct and indirect energy because of the batteries.

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

No, the technology uses an already used technology; wifi.

Do you think the lifespan of the technology is realistic?

Yes. It's an additive on WiFi.

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

If information is being given based on WiFi, users want to include 'sensors' to improve the information being given. Hidden impact is the batteries on these sensors.

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

One central platform for analyzing the data through different tooling.

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Future

Did you consider future impact?

What could possibly happen with this technology in the future?
People could become or behave dependent on the output of the technology.

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.
I would like to skip this section.

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.
I would like to skip this section.

Would you like to live in one of this scenario's? Why? Why not?
I would like to skip this section.

What happens if the technology (which you have thought of as ethically well-considered) is bought or taken over by another party?
I would like to skip this section.

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.
I would like to skip this section.