

# Stress Wearable Platform

The goal of this project is to create a fully functioning prototype. which involves the full process from a user wearing a wearable to users being able to see live data on an application (mobile or web). For this to be realized a connection must be made from the wearable to the backend so that data can be collected from the wearable. Once the data from the wearable has been collected, the data needs to be sent to the user interface.

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Context of use: Other  
Level of education: Bachelor

# Technology Impact Cycle Tool

Stress Wearable Platform

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## 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 main problem this technology is trying to solve is the somewhat lack of stress levels representation in a manner that will aid in the early detection of a patient's stress.

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

Yes, The SWSP will strive to produce the most accurate data representation of stress levels with the data provided by the stress wearables.

## How is this technology going to solve the problem?

*This question has not been answered yet.*

## What negative effects do you expect from this technology?

The negative effect that we expect is some people that want attention and purposely "mess" with their stress data to try and get healthcare people to come help them.

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

A lot of people, both young and elderly, have recently faced higher levels of stress, which has occasionally resulted in mortality. As a result, our technology can help identify stress levels early on so that the patient can receive the right support before a serious situation arises.

## 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.

- We made the decision to include a feedback/commenting system so that the medical staff members who provide treatment for a patient can utilize it to explain the source of the patient's stress levels.

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## Hateful and criminal actors

What can bad actors do with your technology?

*This category is only partial filled.*

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

No

**Can fakers, thieves or scammers abuse the technology?**

Yes, people seeking attention may purposefully "mess" with the data needed for the systems analysis in an effort to attract medical personnel or other caregivers without truly needing their assistance.

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

*This question has not been answered yet.*

**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.**

*This question has not been answered yet.*

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

*This question has not been answered yet.*

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

- Healthcare workers of the system are used to working with potential patients who can be bad actors there they can evaluate their actions accordingly

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## 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?**

Yes the SWSP Stress Wearable Platform does store some personal data of the patients and caregivers. The patients' and caregivers' names, email addresses, month and year of birth and the patient's stress levels.

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

*This question has not been answered yet.*

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

Yes, we make sure that every sensitive piece of data in this case, the user's email that we save on them is encrypted. We also make sure that only people who have been registered by a healthcare organisation may use our system.

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

Yes, with the assistance of lawyers participating in the SWSP's creation, we decided to save only the personal information our system requires by storing a portion of a patient's and caregiver's dates of birth, their emails as contact information, stress data, and first name and last name for identification.

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

*This question has not been answered yet.*

### **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?

*This category is only partial filled.*

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

The identity of the SWSP user is not affected

## How does the technology influence the users' autonomy?

*This question has not been answered yet.*

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

*This question has not been answered yet.*

## 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.

*This question has not been answered yet.*

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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**

Patients at medical organisations

**How is this stakeholder affected?**

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**Did you consult the stakeholder?**

Yes

**Are you going to take this stakeholder into account?**

Yes

**Name of the stakeholder**

SWSP project managers (2)

**How is this stakeholder affected?**

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**Did you consult the stakeholder?**

Yes

**Are you going to take this stakeholder into account?**

Yes

**Name of the stakeholder**

SWSP development team

**How is this stakeholder affected?**

-

**Did you consult the stakeholder?**

Yes

**Are you going to take this stakeholder into account?**

Yes

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

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**Now that you have thought hard about all stakeholders, what improvements would you like to make? List them below.**

*This question has not been answered yet.*

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## Data

Is data in your technology properly used?

*This category is only partial filled.*

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

Yes, due to the signal of high-stress levels data not always being a bad outcome, we will give the users the ability to add a comment on each stress level to signify why their stress levels were high during that moment.

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

*This question has not been answered yet.*

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

Yes, the algorithms and data used will always be up to date.

The stress data collected will be in real-time, and our system will be constructed such that the stress calculation algorithms can be changed.

When a user's data can be erased, we make sure to archive it instead of erasing it completely so that an admin can access it again.

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

*This question has not been answered yet.*

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

*This question has not been answered yet.*



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## Inclusivity

Is your technology fair for everyone?

*This category is only partial filled.*

### **Will everyone have access to the technology?**

Only users registered with a healthcare organisation who actually need the technology will have access to it. Users outside a healthcare organisation will not and we do not see this posing any setbacks

### **Does this technology have a built-in bias?**

For future enhancement of the technology with Machine learning some measurements training the AI most of the time are taken from men, because they do not have a menstrual cycle that 'messes' with their readings, so the results might be less accurate for women

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

The algorithm provided for stress calculation can be verified due to it being used by various medical professionals already.

### **Is everyone benefitting from the technology or only a small group?**

#### **Do you see this as a problem? Why/why not?**

Our technology only grants access to people who are registered with a healthcare organisation. We do not see this as a problem due to the project being funded by the healthcare sector and the main target group are patients

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

Yes, the team creating the technology consists of people from different backgrounds/communities of living, gender and race

### **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.*

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## Transparency

Are you transparent about how your technology works?

*This category is only partial filled.*

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

Yes, we do explain to the stakeholder how the technology works in broad terms. However, we do not explain how the algorithm for calculating stress would work, to the patient users. This is due to the technicality involved and some of the target users are patients with dementia.

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

To some of the stakeholders involved the technology decisions are explained in detail. While others will be given a broad explanation.

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

Yes, the project managers involved are given weekly updates by the development team and therefore if any question arises regarding the technology they will be directed to them.

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

Yes, the development team will make sure to inform users that human supervision is still required and that algorithmic judgments should not be fully trusted.

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

*This question has not been answered yet.*

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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?**

We offer cloud services. These cloud services are energy-consuming. However, we will be hosting our servers with suppliers that have high standards in environmentally friendly data centres.

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

*This question has not been answered yet.*

### **Do you think the lifespan of the technology is realistic?**

*This question has not been answered yet.*

### **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.**

*This question has not been answered yet.*

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## Future

Did you consider future impact?

*This category is only partial filled.*

### **What could possibly happen with this technology in the future?**

The SWSP can become a viable way for a medical organisation to detect stress quickly and gain reliable insight into a patients' stress levels

**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.**

*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 dystopian scenario.**

*This question has not been answered yet.*

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

*This question has not been answered yet.*

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

*This question has not been answered yet.*

**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.*