**Ethical Report**

Stress Wearables Platform

(SWSP)

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| **Date** | 29-10-2022 |
| **Version** | 0.2 |
| **Status** | Completed |
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# Introduction

All ethical requirements identified by the Stress Wearable Platform (SWSP) development team are contained in this document. The project is managed by Petra Heck and Manon Peeters-Schaap. Each requirement is described with possible solutions.

# Ethical analysis Process

To come about the list of requirements, we applied two separate approaches, the TICT tool and Tarot cards of technology (Ethics game).

In relation to the Ethics game, our approach followed the collaboration of a different team of developers. They were able to alert us to potential ethical issues by our team outlining the purpose and functionality of our systems to them. We (SWSP team) collectively determined whether the questions were valid and needed to be addressed. Following the collection of the ethical issues, as a team, we held a brainstorming session to determine potential solutions for each ethical issue. The results thus assisted us in coming up with ethical requirements and some solutions.

We (SWSP) as a team also agreed to use the TICT tool, which has a list of ethical questions, after the Ethics game results to finalize our ethical report. We were able to answer all the pertinent questions about our project using the Quick scan option and generate potential solutions to the posed issues.

# Ethical Questions and Responses

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| **Questions** | **Responses** |
| **Impact on Society** | |
| 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. We consider this to be a problem due to it being the difference between a person living longer or dying early. |
| What negative acts do you expect from this technology? | Patients trying to "mess" with their stress data therefore giving false information to their caregivers |
| 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. |
| **Hateful and criminal actors** | |
| 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. |
| **Privacy** | |
| 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. |
| 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. |
| **Data** | |
| 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 will the technology keep the insights that it identifies with data sustainable over time? | 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 is “deleted”, we make sure to archive it instead of erasing it completely so that an admin can access it again. |
| **Inclusivity** | |
| 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 |
| **Transparency** | |
| 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 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. |
| **Sustainability** | |
| 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. |