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Introduction

Welcome to EUP, the Emotional Upliftment Platform. During the last years the world was faced with the challenge of a global pandemic. Many businesses struggled to adjust to the changes needed to proceed with their activities and survive this challenging times. Not many had a good crisis management strategy on place, and many had to close.

One big challenge was the national lockdown implemented by the government, it meant that non-essential workers had to start working from home and people were no more allowed to meet with their families, friends or other people that did not live at the same household.

“As Humans, social interaction is essential to every aspect of our health. Research shows that having a strong network of support or strong community bonds fosters both emotional and physical health and is an important component of adult life.” (Why Being Social is Good for You, 2018)

As consequence of the social distancing practice implemented by the government, an increase on mental health issues was detected and struggles with depression was one of the issues that had to be dealt with. Depression have been in many cultures a taboo, and regardless of its importance it's not easy to start the conversation and help people recognise the need to seek for help even if just someone to listen to what you have to say.

At this work you will understand more how EUP can help you detect, prevent, and start a treatment for depression. With a focus on business the software can also be implemented in many sectors and areas.

Based on data collected by the NHS, government organisations and businesses, the hypothesis was confirmed that during the lockdown the numbers of people struggling with their mental health issues have increased, we have seen the need to find ways to acknowledge and respect the effects of it.

For this work, we are assuming that once implemented the employees will authorize and allow the data to be shared and they will allow the software to run in their computers in order to detect the depression.

Assuming that mental health organisations and mental health professionals will partner with the software to help provide the support needed. And that the organisations will have a designated training so best treatment can be provided both as a group or individually.

Another assumption is that training will be provided to employees so they will know how to use the software, and how to seek for help in case of needed. Considering the person will accept the help offered, we believe that EUP will be a tool to help this society so used to being lonely to reconnect with being human.

Problem Situation and Domain Analysis

In the last few years, the world has been facing with a challenging moment in all aspects of our lives. In 2019, in Wuhan, China, cases of the coronavirus were observed. Covid-19 is a respiratory disease that is highly contagious, and in few months after first appearance was already observed in different countries around the world becoming then a worldwide pandemic (Bhargava, 2020).

Due to its high transmissibility most governments around the world imposed a national lockdown. As its consequences most of workers had to find alternative ways to keep on working. Some people working from home, others had to claim government benefits as a result of businesses closing or the nature of their work, and organisations taking too long to be able to adapt to the new changes, either for believing lockdown would last only few months, or for lack of preparations and risk assessment.

In a world where many people suffer on silence, with the heavy access to social media that represented back then the perfect life, mental health was taboo and with the lack of socialisation during the lockdowns the mental health issues indices reached new high levels.

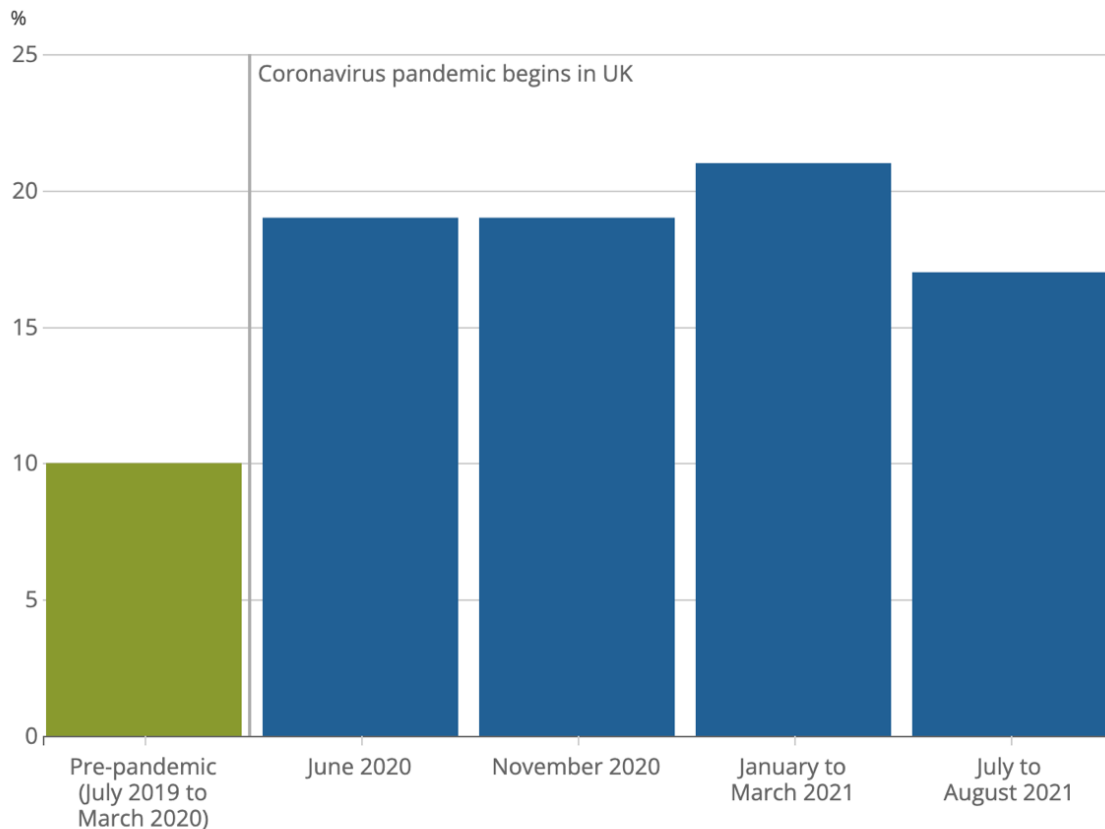
According to (Wasserman, Gaag and Wise, 2022), the term “Social distancing” “evokes negative feelings of being ignored, unwelcome, left alone with one’s own fears, and even excluded from society.” Instead, the research believes that it should have called “Physical Distancing” as the distance should have been physical to reduce the risks of spreading the COVID-19, but social interactions should have not been altered.

“The inner psychological entrapment of persons close to suicide can be magnified not only by physical entrapment in the lockdown situations, but also by the terminology used of social distancing.” (Wasserman, Gaag and Wise, 2022)

During the Pandemic was observed an increase on the percentage of adults showing moderate to severe depression compared to pre-pandemic percentages (Leach, Finning, Kerai and Vizard, 2021). The levels of depression symptoms got lower towards the middle of 2021 when

lockdown restrictions were already been eased but has never gone back to pre-pandemic levels as seen in the Figure 1.

Percentage of adults with moderate to severe depressive symptoms,
Great Britain, July 2019 to August 2021



Source: Office for National Statistics – Opinions and Lifestyle Survey

Figure 1 Depression Levels Pre and during Pandemics

WHO, the World Health Organization, has developed, based on the increased numbers of people affected by the Pandemics on their mental health, different programs that can help people cope with their situations. One of their mental health action plans was the “Problem Management Plus”, that involves a series of practices and techniques on group or individuals that the organisations can implement to their practices. (Depression, 2022)

The data related to mental health referrals due to the isolation would be hold by NHS and specific analysis on the data could be done if the information is requested and provided. As a result, different sectors of businesses as of the community and services were affected by the effects of the increased data on the mental health.

With the analysis of the Data and the development of a program that can help the employees and organisations cope with the decreased efficiency due to the increase on mental health problems resulted from working from home or also applied to employees working at the office.

The program consists of a software that will be able to detect through face detection using a webcam if the person is showing signs of depression. From the detection a prevention plan will be activated and in case of need professional help suggested. This is a prevention program that can be applied in different sectors and adaptable to the business's needs.

As seen at Figure 2, using the Influence x Interest grid, (Stakeholder Matrix Templates, 2022) we can observe with high interested and high influence the employees and the employers are side by side, as in this matter, both parts must want to improve the situation to have results. As consequence, the NHS will have less people having the need to seek for help as in a campaign to help the mental health, the prevention is the base of the treatment. With high influence but not so much interest, so they need to be kept satisfied, there's the Government and all its regulations that needs to be respected; the WHO, that already have work on the matter and the other CxOs, that will see the consequences of more efficient employees. To keep informed as its high interest and low influence are the developers, health professionals, HR, and Training departments as they will all be working together to make this project a success.

To Monitor there's the competitors, both on mental health programs, as of training providers and other organisations.

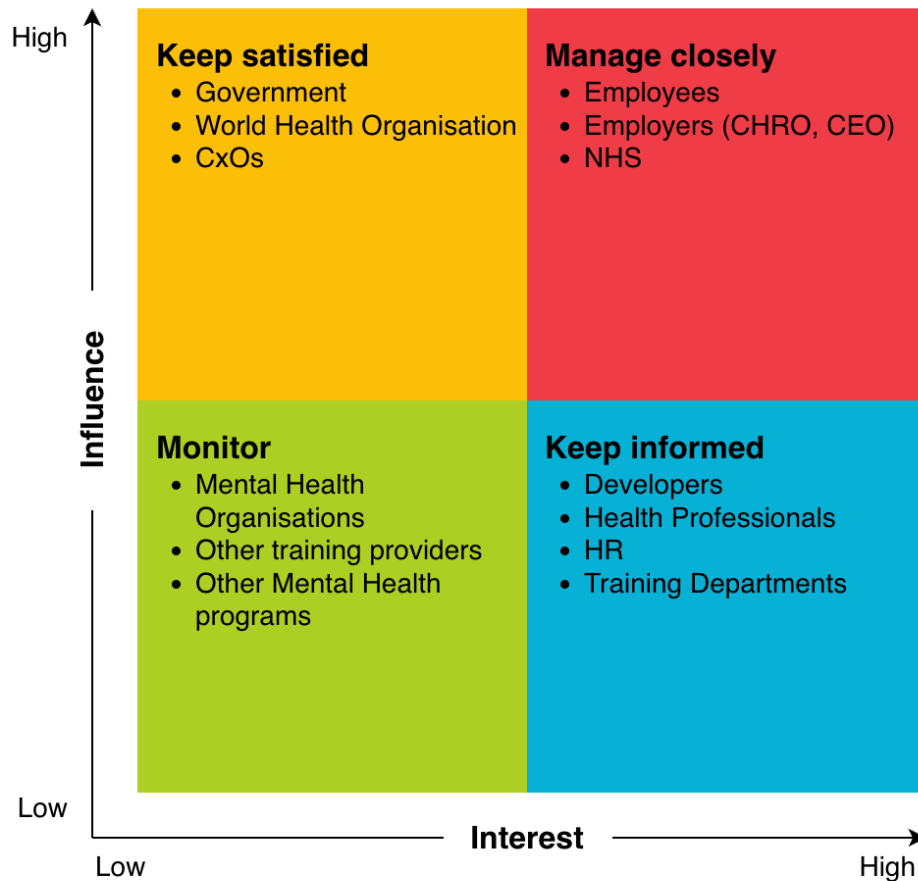


Figure 2 Stakeholder analysis - Created on Visual-Paragigm.com

There are already on the market different programs that uses face detection; however, we could not find one that are applied in a program to improve organisations efficiency and same properties as this program is designed to be.

In many organisations there are a department specialised on looking after the wellbeing of the employees and providing training as needed by the businesses, we will not compete with those training programs, as we will position ourselves as a tool so those departments can have a good solution for coping with mental health on workplace.

The technology available at the moment using local curvelet patterns in three orthogonal planes (LCBP-TOPs) were only 73% accurate in 2019 accordingly with National Library of Medicine research (Gavrilescu and Vizireanu, 2019). On another research on the International Journal of Pure and Applied Mathematics in 2018 where the face recognition detects the micro movements of the facial expression and the changes on the iris are accurate enough to be able to differentiate between a depressed face and a sad face.

Value Proposition

The program shown on this work will focus on helping to track early stages of mental health issues and flag to users the need of an action. When someone is struggling it affects their lives in different aspects, like their confidence, or the thinking processes, affects physical, dietary, and social interactions as examples.

For the businesses, having people calling sick, changing career, working less efficiency, quitting, or bringing a toxic behaviour to the workplace are also examples that can affect directly to the main goal of the business in different ways.

For the NHS and the local authorities, having people claiming benefits for not being able to work properly, having to book multiple appointments, not only for mental health, but also for other physical issues that comes as consequences of the poor state of mind, are also highly affected by it.

Taking into consideration these aspects as examples of how looking after our mental health can interfere our lifestyle, workplace, community and society, this project has as job to help all this sectors to benefit from the program. Our customer are organisations that wants to help to prevent mental help problems and give the appropriate support to help prevention and treatment when necessary.

As benefits from it, overall lifestyle of employees will improve as the atmosphere at working places will be healthier, we are opening a conversation about this matter that are dealt as a taboo in many cultures, ages, gender, and social backgrounds. For the organisations, tracking the problem early prevent future cost with sick days, treatments, and reinforce a good atmosphere in the company raising the feeling that the company care about the well-being of its employees.

However, we understand that this work comes with challenges. Privacy being one of them as in sector, cyber security has been given huge attention due to the risks that comes with it. Due to the sensitive information's, we will be dealing with and the need to carry on regular updates on the safety of the program as we take very seriously the privacy of our users.

Still under the challenges we will face during the project is lays the quality of the face detection technology, we know that the technology exists, but constant research will be done in order to update the system regularly to the most accurate version available.

Considering that there will be camera monitoring the user, we also take into consideration the feeling of being monitored at work can add unnecessary stress intensifying the state of anxiety and worsening the mental state of the user. Taking it into consideration, we will open the program with a question to the user asking if he would like to have the service activated, remembering them that all information is private and not the company nor any of their colleagues will know what his mental state is, unless he wishes to seek for help from the company.

Different options for privacy will be available. Inspired on the people that would rather not have any camera facing them during work hours, we will invest on the research of a bracelet that can help provide the same kind of result based on vital signs. The technology exists and there are competitors on the market. We will strategize and decide in a near future if a partnership with the bracelets providers is a better option, then develop our version of the technology based on our needs. (Thompson, 2019)

Other Obstacle we will be facing its relating to the organisation culture. According with McKinsey & Company research, there is a disconnect on perspectives relating to mental health at the workplace. On this research it was compared three areas: “Level of employer support for mental health, employee access to mental illness and substance use disorder treatment, and workplace stigma.” (Coe et al., 2021)

This research also concludes based on data collected from two national surveys that employees try to communicate with their employers their mental struggles, therefore there is still the need to improve this communication and awareness of the need to open the conversation. (Coe et al., 2021)

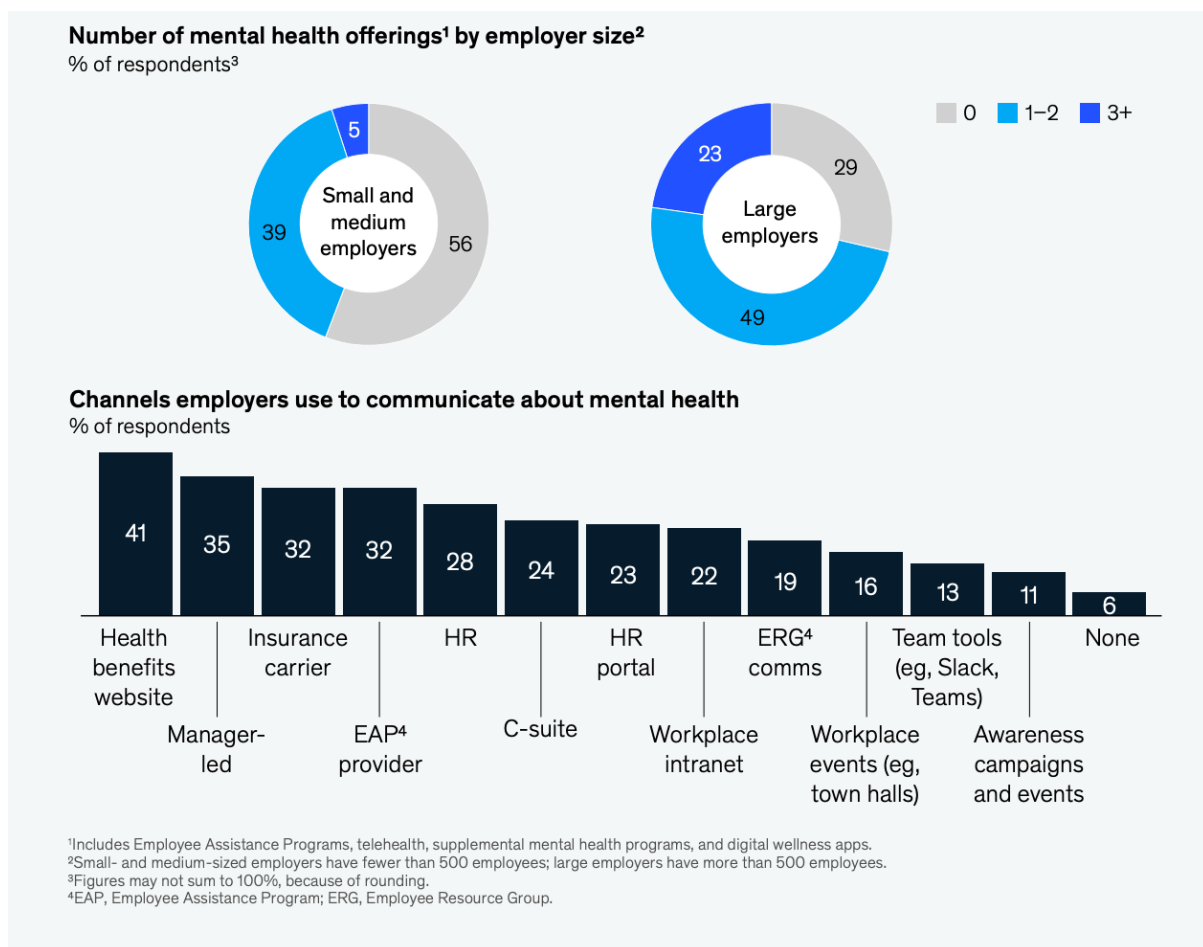


Figure 3 McKinsey & Company employers' channels for communication.

Taking these factors into consideration, we will provide a software with the face detection that will be able to help track the levels of happiness of the employees. The software can be offered as a product, or as a service with the different levels of support we can provide to help the organisations implement a healthier environment. Along with the service provided, a training tool can be added to its value.

The product and service provided will benefit both clients and its employees as it will, as explained above, provide a better and healthier environment, will help people struggling to feel that they are not alone, and that people on risk can track the issue before it become a bigger problem and affect quality of life. This program will be resulting in a more efficient workplace.

Business Model

Inspired on the data analysed and on the observing of the effects of the Pandemic into businesses and mental health of its employees, we designed the EUP, Emotional, Uplifting Platform.

This platform consists of 4 phases:

Phase 1 – Detection, at this phase, the software will detect, using face recognition technology, the degree of happiness of the user. The user will then know if any action should be taken, and during its day of work, if any changes happen the software will be able to offer an action to be taken.

Phase 2 – Prevention, at this phase the software will be monitoring the state of the user, if the level of happiness starts to drop the program can offer them alternative ways to help improve their mood, ex. Coffee break, listen to music or a stretch. (See appendix 1)

Phase 3 – Treatment, when the user level of happiness drops to reach levels of depression, a bot will pop into their screen and offer few options to help them access their needs. The user then will be able to choose between a series of alternatives that mental health professionals will suggest.

Phase 4 – Monitoring, when the user shows signs of happiness again to the prevention levels, the system keeps running on the prevention mode.

The organisation can have the view as a group or as different teams so they can target incentives to different groups and access what at their work routine is affecting the mental health and the efficiency of work. The software will be producing data as it works, with the privacy of individuals protected and appearing to leadership as a group. (See appendix 2).

The software can be sold as a product or as a service, the service being the treatments and professional mental health support provided. If the levels of happiness are dropping as a group

in the company, the software can offer activities as a group to help with social, team bounding, and overall wellbeing in the organisation.

Other factors that are also connected to mental health, like exercises, diet, family for example will be taken into consideration and the well-being of the users will be the principal goal of the software, as we believe it is a connection between mental health and worker efficiency. (Consequences of Student Mental Health Issues | Suicide Prevention Resource Center, 2022)

Inspired on the “Strategyzer” (AG, 2022) Business model canvas, and designed at “Visual Paradigm” (Visual Paradigm Online - Suite of Powerful Tools, 2022) tool you can see the figure bellow the Business model canvas for the EUP.

EUP - Emotional Upliftment Platform

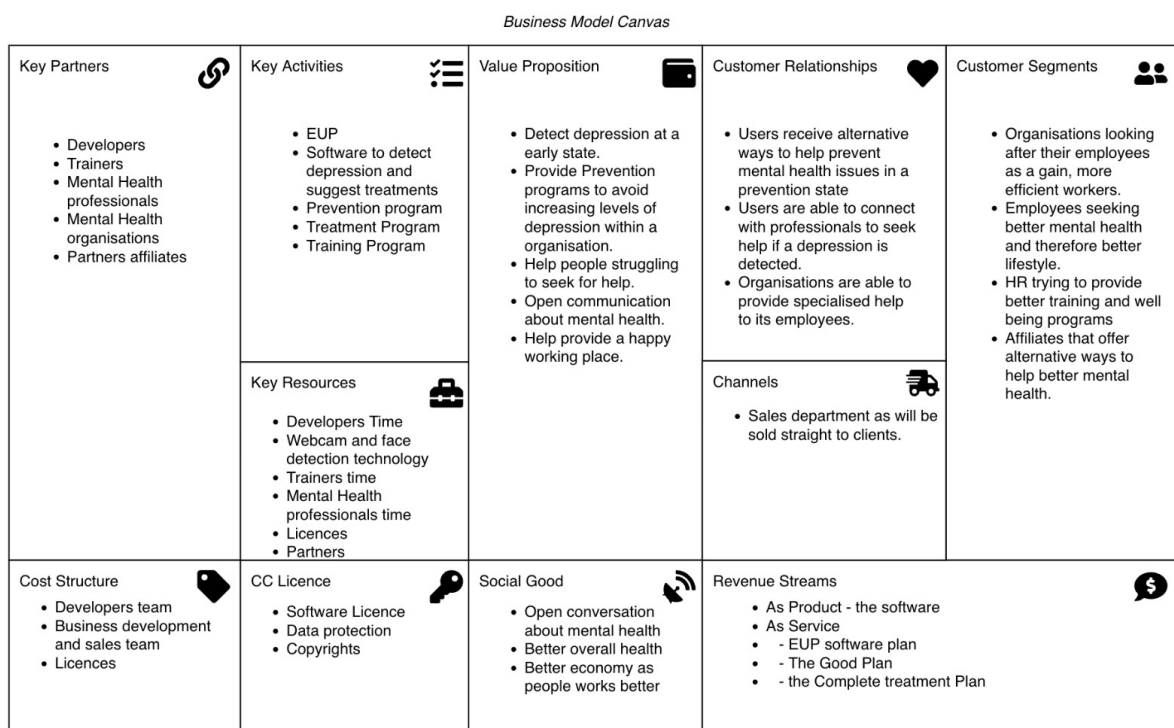


Figure 4 Business Model Canvas - EUP; Designed at Visual Paradigm Online.

The EUP aim on improving the lives of employees and the productivity also benefiting their employers, therefore the program will work alongside health professionals and mental health organisations to help support all in need. We recognise that first steps towards a healthy mind

is to recognise that you need help, and accept the help offered to you. Accordingly, to D.O. Matthew Goldenberg, certified in psychiatry, *“It is often very hard for someone who is struggling with addiction or mental illness to reach out for help. Sometimes there is significant denial. In other cases, shame, guilt, a feeling of low self-worth or even depression can make it seem impossible to get help.”* (Goldenberg, 2022).

With EUP we aim on helping people recognise they the situation and understand that it is ok to seek help and “you are not alone”. We will work as a ‘bridge’ to help connect the person to the organisations and professionals able to help.

For Future of this business more innovation can be added with the implementation of the software in pods that can simulate a full immersion on the office from anywhere the pod is located. In case of the pod, actions suggested could include music, change on senary, or colour therapy as example. This way in a next pandemic or other situation that would require the mass home office practice, the employees can still experience the feeling that they are in the office.

This idea is hypothetical, and no research was done yet towards this goal, however we recognise that it would solve not only problem of socialization in a case of another physical distancing necessity, but also a trend in regard long distance meetings overall. It can provide a safe, environmentally friendly, and comfortable environment for the person using. It could be used for office related activities, but also for shopping, relaxing, meeting people, porn industry, medical consultations or even international meetings with translation applied if desired. Further research on this can be done in the future to support the idea.

Technical Solution Design

For the design, development, and implementation of EUP, we will be following the roadmap (Appendix 3).

The roadmap includes the marketing, development, and designers' team. On parallel will work the cyber security, the therapists and trainers' team. All strategies aligned with main business goal and alongside with sales strategies and business development.

The process of the platform will start with a welcome page, and the user authorisation to be able to use the app following the security and regulations. Then an assessment is made with the capture of the image, and face detection. The face detection algorithm with the classifier will lead to facial extraction, and classification of the mood with the machine learning technology, all of it using Hadoop distributed file system (HDES), as it can store and process the data as it allows multiple computers to analyse the big amount of data that will be generated with the platform. With the classification made, the level of happiness, contempt and disgust will be made, and the percentage of happiness accessed to detect degree of depression (Appendix 4).

The data from the public records, NHS, government records, and organisations, inspired the work. The necessity of assessing and threatening the mental health issues was detected as a structure, human generated, descriptive analytics. It is an open data found on those organisations' websites.

During the face detection process the data generated when gathering the results is an internal, structured, machine generated, prescriptive analytics. The data that was previous registered in the system with the facial patterns for the recognition is internal. Unstructured and human generated descriptive analytics.

When the platform is full on working, the volume of the data will be of the capture and analysis of all users in the company, for big statistics and comparisons for mental health it can be used as a big proportion as well comparing different companies or workers within a city as example, the amount of data generated will be so big that a good and efficient system capable of storing and processing the data is required, as another example of why the use of Hadoop.

The data collected during the face detection phase needs to be for real-time, and real-time analysis, as the user would like to have access to its information's at time of login, and for the organisation to react to the change of mood they also need to have real-time information on the data generated. For long term analysis partial data need to be restored, and personal information will be kept separated for privacy of the users so those will be done on batches.

The visualization of the information generated will be simplified for the users, and for the organisations that would like to verify happiness status for the company (Appendix 1 and appendix 2). Then an easy to visualize graph as a perceptual inference, will be produced where the organisation will be allowed to access what days in the week, time in the day or seasons of the year that the mood variation occurs and allowing them to prepare for events or assessments when prior to specifics days.

Using machine learning a clustering of similar behaviours in similar instances could be able to appoint what could be the cause of the increase of mood variations or depression at the workplace.

Feasibility Demonstration/ Analysis

To the development and implementation of the EUP software, we will require the work of 3 developers, for 3 months' estimated work as per roadmap (Appendix 3).

Once the platform is created investment will be done on the professionals to maintaining the platform working, beside management, a cybersecurity specialist, trainers and HR specialists, and mental health professionals as a support for the organisations that would like to purchase the plan that includes this service.

The sales team will have available to offer our clients three different plans:

- 1- The EUP platform – this plan includes the platform to be installed and real time data will be generated, and the immediate information will be provided. No training or treatment will be suggested, but organisation would be able to analyse by themselves the data and act on their own. Further services would be able to be purchased if wished to do so.
- 2- The EUP tracking – This plan aims to cover all the main platform does but added simple suggestions for users and organisation so they can have a more efficient and effective prevention plan. In case of depression detected, we are able to suggest our other services and recommend professionals.
- 3- The EUP Treatment – This plan includes all the other plans advantages, with added professional help for users with depression. Extra suggestions as group actions will also be added. The analytics on this plan will allow the organisation to track with more details where and when the problems happen, and comparisons with strategies suggested with our team of consultants.

The prices will vary on the plan and the size of the company calculated by the number of employees.

Professional and Ethical Issues

When developing a work that touches such delicate matter as the mental issues, one need to pay attention to the responsibility of be dealing with people's minds as it affects their lives. With that in mind, we had to take into consideration the gathering and storage of data issues regarding its safety, the treatments offered at the prevention and treatment phases, and effects that it has on the users and the community.

When dealing with personal data, and sensitive information, it's important to keep a regular check on security and keeping good practices can save the business from endangering the data gathered on the system.

Cybersecurity have been widely invested in many sectors as information became valuable and protecting it, essential. EUP will be dealing with sensitive information and therefore invest on the safety of the data collected and of the access on information. For the reason, the users will not be allowed to share or copy any information generated on the process, as part of our platform the analysis will be done by us, and the organisations and users will only have access to the information relevant to them.

Mental health can reflect on how people operate on work, but also on their personal lives, like exercising and diet. EUP will help provide information on this matter and help influence the community regarding this thing. However, we recognise the importance of this information being given by professionals. We understand that uniformed advice can be dangerous, and its consequences can worsen the user's situation.

The platform when implemented will be followed by training and support will be available to always help the users so they felt confident and stress free. We recognise that the feeling of being monitored could add stress to some users, and due to it and their privacy all information generated will be anonymous and not the organisation or any of the users' colleagues will know this information belongs to them. The change of behaviour due to being monitored, also known as "The Hawthorne Effect" was also considered. And it can affect the results at the first weeks of the use of the platform, however as the program will run in a constant, the software for the face detection works on the micro movements of the facial expressions the iris changes. The

user hardly will be able to control it, and in exceptional cases that they do, as the program run on a long-term basis, the control over those movements will cease at some point allowing the machine learning to recognise the control and recognise what are the real signs of a depressed face. The fact that no personal information will be shared will remove the feel that some users might have to try to control the system. Accordingly to Kendra Cherry, when the responses are made anonymous and confidential they feel less likely to try alter their behaviour (Cherry, 2020).

As a community, being able to provide a healthier environment and happier people will impact on the lives of all involved on the users lives. To start their families, as during lockdown the number of offences registered as domestic abuse has increased and one of the reasons could have been by the increase of mental illness that followed same period. More information about the domestic abuse during lockdown can be found at the Office for National Statistics. (Stripe, 2020)

EUP aim to work alongside government, national health system and mental health organisations. The treatments for people living with depression will be dealt as a serious thing, and professionals will be able to provide with the right treatments. However EUP can help connecting those professionals to the users, and raising the conversation making it not only removing its taboo, but mainly bringing the feeling that “you are not alone”.

Critical Evaluation

EUP was inspired by the increased register of mental health issues due to the lack of social interactions resulted from the lockdown implemented during COVID-19 pandemics. From that the idea that we are now able to detect the signs of depression before it becomes an issue comes as a hope to solve this problem that can cause such big impact into our lives. No one is immune to it and the respect to our bodies and mind is essential to avoid it.

We recognise that we will face challenges on the way, and that being for example the users that will refuse to use the tool, or the organisation that won't be willing to provide the support after the problem is diagnosed. Challenges like this can have multiple solutions and for each one that comes our way we will brainstorm and find a way to still respect the body, mind, and privacy of the users.

For this work we assumed that those are not a problem, we assumed that will be collaboration from the users, the organisation, the government organisation, and all partners involved in its processes. We assumed that the technology would hold the accuracy of the platform, and that the technology at the bracelets that detect depression using vital signs will also be good enough to provide the best service available.

For the ideal world, we will have people talking about mental health, realistic conversations and more people feeling happy and satisfied with their lives. As consequences, the businesses will have more efficient workers, less toxic people and a sense of community that will not just be good for their marketing strategy, but will reflect on results, as happy and successful people have an impact on the community.

Conclusion

EUP is a tool to help improve people's lives. It will have direct impact on the business using the tool, and as consequences at the community and a good impact to the lifestyle of the ones involved with it.

Having seen the data generated during those troubling times and the consequences it can have in a society, the need to access the issue is essential to the wellbeing and the future. With an impact to its users providing a better lifestyle, to the organisations providing better working conditions and to public services providing better health and support to the population, EUP comes not only as a tool to help the business, but as an impact to all it touches.

From having an accurate face detection technology and supporting bracelets for those that won't be able to use the camera program, from the training and treatments provided that not only access the issues on hand, but also brings the team together and helps not only the users seeking help but increasing the quality of the workplace for those also with a healthy mental state. Opening the conversation and bringing the community together. EUP will provide a hope of a better place.

For the future of the company, we visualize many different uses of the technology, but also leads to the development of solutions for employees to be able to work from home without the feeling that they're isolated. The software on its own could be provided to help support users not only on workplaces, but in the example of having it available at GPs, library or public services places where the users will be able to anonymously see the percentage of depression and have a quick suggestion to what to do or where they can seek advice, the platform then will allowed to help all able to access a digital device that supports the technology.

As a conclusion of this work, it's important to understand that the first step to heal is to recognise the problem. EUP has a social responsibility and a promise of a better world. We all have experienced or know someone that had some kind of struggle. And being able to talk about it or to recognise it, it's not always easy. EUP is a safe place and a solution to this healing process.

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Appendix

Appendix 1

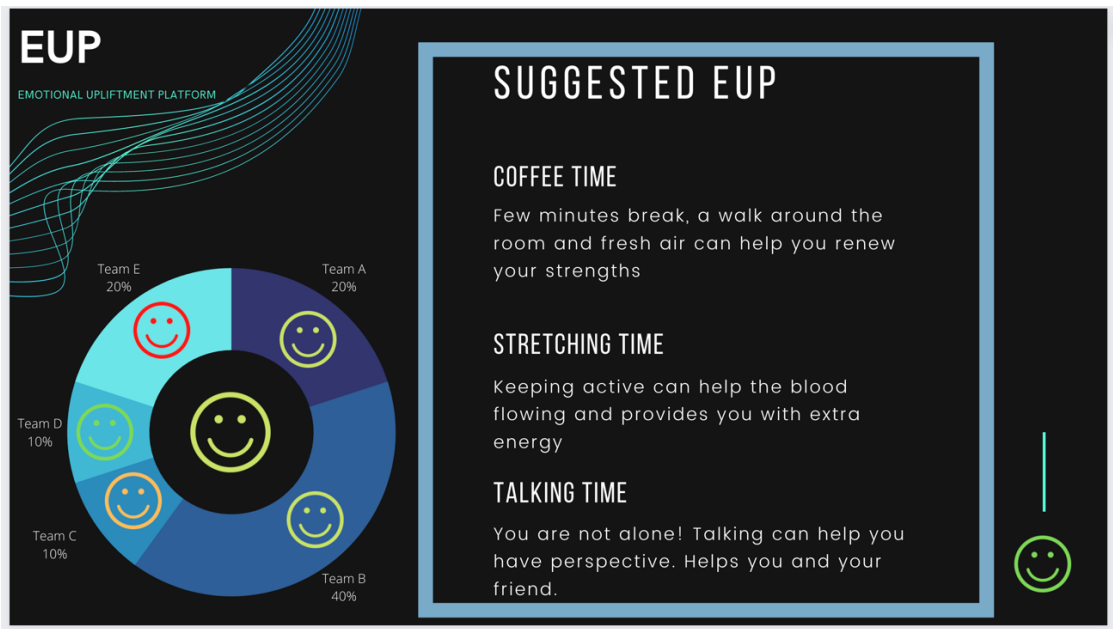


Figure 5 Example of Prevention suggestions - Phase 2

Appendix 2

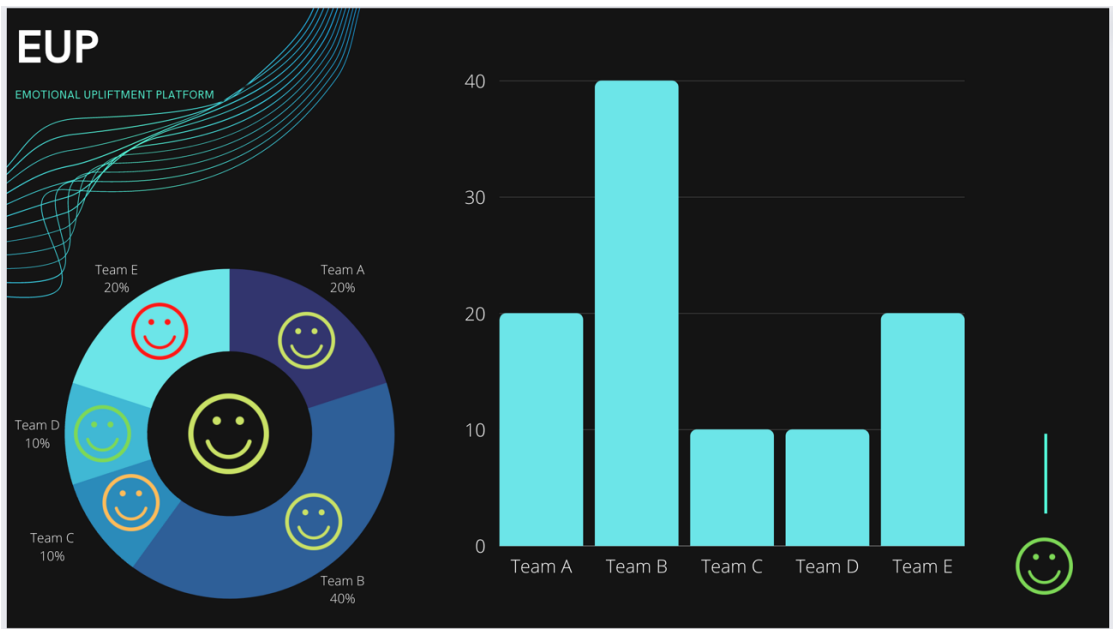


Figure 6 Example of team view for leadership

Appendix 3

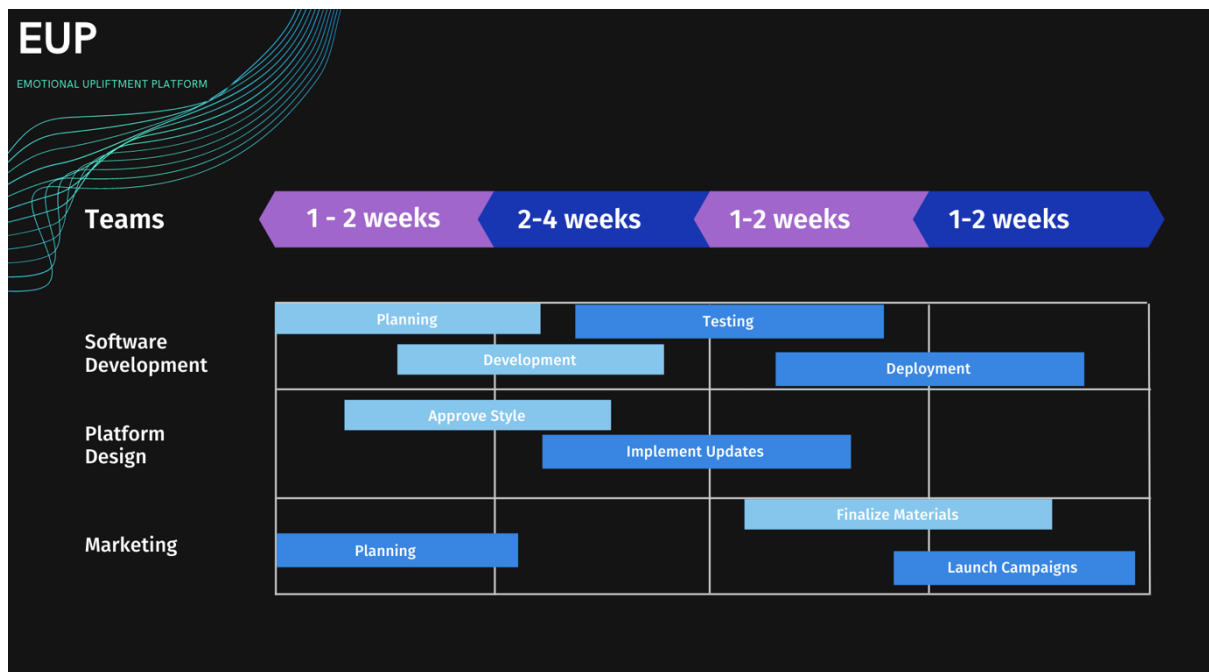


Figure 7 EUP roadmap for development and deployment.

Appendix 4

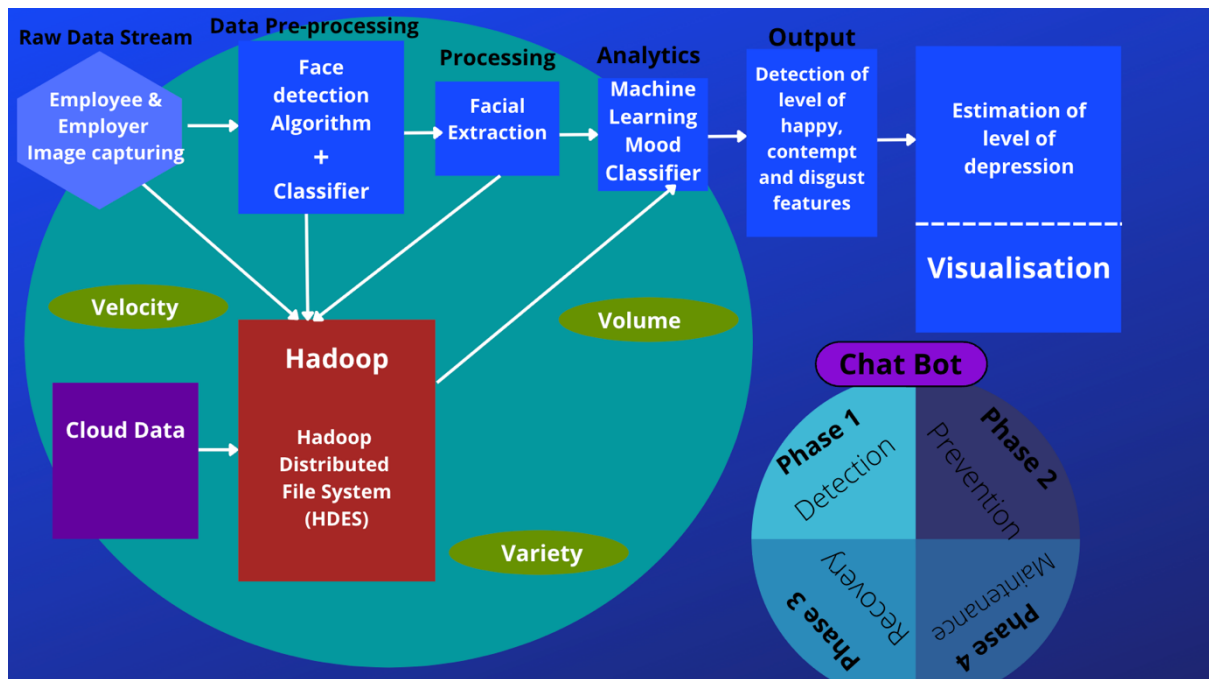


Figure 8 EUP process