URICHECK

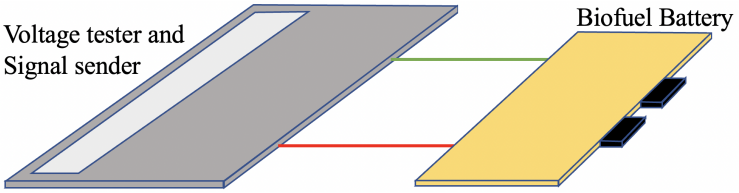
1. Executive Summary

Lack of regular screening sessions for seniors can result in undiagnosed health problems, causing serious threats to their health if left untreated. Another problem is that the world is facing a healthcare worker shortage[1]. To resolve these two issues, we have invented URICHECK, which enables seniors to regularly monitor their health using AI and technology, from the comfort of their own homes.

2. Our mission / about the company

Our mission is to diagnose seniors with diseases early through our diaper sensor, URICHECK. This system detects and analyzes substances in urine, then identifies diseases seniors may have. We have designed our product so it can be utilized by seniors easily. It can be used simply by attaching our biosensors to their diapers to analyze urine and determine diseases that seniors are prone to, such as Chronic Kidney Disease (CKD), diabetes, liver diseases, and kidney diseases.
Through this product, we aim to protect seniors' health by detecting diseases early and enabling hospitals to treat diseases in their early stages before they severely harm seniors' health. Early treatment and diagnosis are especially important for seniors as they are more vulnerable to diseases, due to their immune systems weakening with age [2]. We hope to assist elderly people to achieve a healthy lifestyle, by enabling them to access professional treatment when needed, and encouraging voluntary change in their lifestyle in less severe cases.

3. Product and Service Description



URICHECK is a biosensor that seniors can easily attach to their diapers in order to allow early detection and possible treatments. The biosensor is capable of detecting 137 substances that are known to exist in urine. Enzymes and antigens in the biofuel battery are used to bind substances, and electric currents are passed through them. Then, the data of voltage strength, which shows the concentrations of these substances, are sent to the AI for processing.
The AI uses K-NN (K- Nearest Neighbour) and SVM (Support Vector Machine) Machine learning models to analyze urine data and determine diseases based on weight, in a decision tree format. The SVM algorithm is used to detect diseases. Whether the concentration of a substance in urine (e.g. Ketone body, protein, glucose) is above or below the critical value, allows the identification of possible diseases. The K-NN algorithm is used to determine the severity of a specific disease, as it can be implemented in multiple classes. K-NN compares how close the value for a specific factor (e.g. glucose level) is to the data of other severity classes in the database, to categorize data based on severity. If the data belongs to a group of severe conditions, without the possibility of natural recovery, the AI immediately notifies the doctor, allowing necessary treatment to take place. If natural recovery is possible, the senior and their family are notified of the patient's current condition. This allows seniors to voluntarily change their lifestyle according to their condition, in order to improve their health. Since this biosensor is used on a daily basis, seniors and their families can monitor slight changes in health conditions. Clearly, this biosensor and AI play the indispensable role of supporting seniors to take action themselves to protect their own health.

4. Market, Customer Analysis and Marketing

The target customers are seniors, who may have diseases, or seniors already diagnosed with diseases, for monitoring. The target industry is healthcare facilities, as URICHECK makes monitoring cheaper and more time efficient. Additionally, within the biosensor market, wearable biosensors hold the highest compound annual growth rate [3]. Home diagnostic applications are expected to grow at the highest rate between the years 2021-2026, showing URICHECK's demand will continue to increase in the coming

years[4]. Additionally, URICHECK is the first biosensor that monitors more than one type of health condition, as well as identifying the severity of the disease. This product promotes good health, not dependence as it aids in the diagnosis and treatment of diseases, without changing seniors' daily routines. URICHECK is ethical as it's pain-free and non-invasive, unlike test kits that use needles/insert microchips inside the patient's body. In addition, it's easy to use, making it appropriate for seniors. It increases the good health and well-being of seniors, fulfilling the 3rd SDG goal. As the number of doctors available to look after the patients are decreasing, we will use technology to more efficiently detect and diagnose health issues. We plan to promote this product through doctors, health care systems, and elderly homes able to persuade seniors who are suitable for this product to purchase it.

5. Finance

Item	Amount in $US		
	Year 1	Year 2	Year 3
Revenue	**12,115,800**	**30,289,500**	**80,772,000**
(Units sold)	600	1,500	4,000
(Unit price)	20,193	20,193	20,193
Production Cost	**3,634,200**	**8,091,000**	**17,032,000**
(Unit cost)	6,057	5,394	4,258
(Production cost per sensor)	6,057	5,394	4,258
Expenses	**8,322,077**	**8,322,077**	**8,322,077**
(Labour cost)	1,319,993	1,319,993	1,319,993
(Manufacturing labour cost)	339,993	339,993	339,993
(Researchers Labour cost)	980,000	980,000	980,000
(Marketing cost)	178,033	178,033	178,033
(Marketing labour cost)	80,000	80,000	80,000
(Advertisement expenses)	98,033	98,033	98,033
(Manufacturing expenses)	6,824,051	6,824,051	6,824,051
(Utility costs)	6,800,000	6,800,000	6,800,000
(Rent)	24,051	24,051	24,051
Profit/Loss before tax	159,523	13,876,423	55,417,923
Income tax (30%)	39881	3469106	13854481
Net Profit/Loss	119,642	10,407,317	41,563,442
Start up cost	**720,000**	**0**	**0**
(Capital Investment)	670,000	0	0
(AI software and hardware)	420,000	0	0
(Patients data)	250,000	0	0
(Other Business Expenses)	50,000	0	0
Free cash flow	-600,358	10,407,317	41,563,442
Funding required	322,000	0	0
Loan required	143,400	0	0
Repayent of loan	0	0	7,900,000
Divident for shareholders	0	0	650,000
Final Cash Balance	**-134,958**	**10,407,317**	**33,013,442**

Our initial capital investment is relatively cheap, as our main operation system is the AI. Additionally, we will only have to buy the patient's data for the first year, since data is added on.
The production cost of the sensor is expensive compared to other smart diaper biosensor businesses. However, this is due to the advanced technology and wide range of factors that are offered in this product. Furthermore, the production cost per sensor will decrease due to the increase in the economies of scale. Our business will break even in 1 year and 1 month allowing us to repay the loan and pay dividends to shareholders by the third year, allowing us to increase sales. We will be profiting from this business relatively quickly.

7. Conclusion

URICHECK will enable efficient excretion disposal, analysis and identification of diseases.
This is to resolve problems of elderly people unable to use the bathroom, and suffering from undiagnosed health problems from not receiving frequent check-ups. Our product will contribute to the achievement of the 3rd SDG goal of good health and well-being.

8. References

[1]https://www.who.int/health-topics/health-workforce#tab=tab_1
[2]www.latrobe.edu.au/news/articles/2020/opinion/why-are-older-people-more-at-risk-of-coronavirus\#:~:text=As%20we%20age%2C%20our%20immune,phenomenon%20called%20a%20cytokine%20storm
[3]www.grandviewresearch.com/industry-analysis/biosensors-market
[4]www.marketsandmarkets.com/Market-Reports/biosensors-market-798.html