Cerebrum Coin

By

James Marshall & Darren Woodcock

B2BXB Limited

Monday, 06 January 2025

Abstract:

We are offering investors a unique opportunity to invest in Cerebrum Coin, a global project that will give investors a substantial return on their investment. B2BXB aims to create the world's largest international database of 'dynamic handwriting' (which includes art, doodles, handwriting, printing, numerals and signatures) of all cultures starting with the English written language, then European and then India. Eventually, B2BXB will aim to have all countries around the world within the database. The database will also retain the world's largest qualitative and quantitative database to compare against the 'dynamic handwriting'. This database will be world leading and give the ability to monitor illnesses and their impact upon the human population. As you will read our Cerebrum Coin is real opportunity, with a real product that addresses the need for healthcare professionals to monitor a patient's health across all physical and mental illnesses. By creating Cerebrum Coin, we can fund research in different countries and keep control of the Intellectual Property Rights, charge monthly subscriptions fees where applicable, employ people in different countries, and seeks collaboration with all Universities, Hospitals, Healthcare Hubs, Communities and Health Care Authorities across the globe.

Key Words: Cerebrum Coin, HAST-Medicare, Alzheimer's, Monitoring,

The Absolute Global Need for Monitoring Alzheimer's [1], [2], [3] Patients

Why the Absolute Need? According to the WHO website [4] In 2019 Alzheimer's cost the global economies 1.3 trillion US$ and 50% of those costs are attributable to informal carers. The cost of Dementia to the UK according to the Alzheimer's Society website [5] has already reached 42 billion in 2024 and set to rise to 90 billion by 2040. This raises the question if this escalatory cost can be slowed down or reduced through a non-harmless and non-invasive alternative therapy? National Institute of Aging [6] is researching whether '*brain games*', can reduce mild cognitive impairment or dementia. Brain games will rely on '*fine motor skills, memory, neural pathways*' et al. Handwriting or art (graphic expressions etc.,) relies upon the same process as '*brain games*.' If a person has mild cognitive impairment (deterioration) and cannot write, it means the person has developed a '*form of dyslexia*'. We are born with dyslexia until we have learnt to master reading and writing through our schooling years. The Alzheimer's Society hints

[1] Lifestyle, Behaviour, and Cognitive Training Intervention Research | National Institute on Aging (nih.gov)

[2] Learning disabilities and dementia | Alzheimer's Society (alzheimers.org.uk)

[3] What is Dementia? Symptoms, Causes & Treatment | alz.org

[4] Dementia

[5] Soaring dementia care costs reach £42 billion in UK – and families bear the brunt | Alzheimer's Society (alzheimers.org.uk)

[6] Lifestyle, Behaviour, and Cognitive Training Intervention Research | National Institute on Aging (nih.gov)

a possible link between 'dyslexia and dementia.' [7] Therefore, handwriting is a credible method of monitoring different types of dementia.

The Mental Health Platform Hubs (MHPH's) [8] website states *'Hubs will be flagship investments, that draw together relevant expertise from across the UK Research and Innovation (UKRI) spectrum and engage relevant stakeholders, to carry out impactful research on serious mental illnesses. The hubs will together constitute the core of the mental health platform (MH platform)'.* The HAST-Medicare Software offers a unique solution by using Graphometry techniques to provide measured outcomes and mental health research.

Healthcare Practitioners: GP appointments in the UK are on average 9.2 minutes long according to Helen Sailsbury GP in the British Medical Journal (BMJ) [9]. Often GP consultations run to 16 minutes which cause the GP to run late with their appointments. Patients just know they are not feeling well or need help. With a new patient, the GP must ask extensive questions to determine a starting point of what tests may be required or the help that can be given. If the patient complains their prescribed medication is not working, the GP is now in a *'monitoring mode'* and may change the medication and ask the patient to *'see how they get on'* or request further tests. *Imagine if the GP could see the bigger picture of a patient's health 'at a glance' in advance of seeing the patient?* This would enable the GP to search and compare medical records more efficiently and contribute to a more effective monitoring of the patient.

Medical Research and Time Lags: The Journal of the Royal Society of Medicine (JRSM) article '*The answer is 17 years, what is the question: understanding time lags in translational research*' reveals it can take 17 years from 'bench to bedside'[10]. (J R Soc Med. 2011 Dec; 104(12): 510–520, Zoë Slote Morris,[1] Steven Wooding,[2] and Jonathan Grant [10]). This paper is supported by another paper by Hanney, S.R., Castle-Clarke, S., Grant, J. *et al. How long does biomedical research take?* Studying the time taken between biomedical and health research and its translation into products, policy, and practice. *Health Res Policy Sys* **13**, 1 (2015) [11]. Clearly, the issue of *'time lags* and data being out of date is a real challenge and needs a solution from that cuts the 'bench to bed' time of 17 years. *Imagine if there existed a method where qualitive and quantitative data could be collected in 'real time' that gave common data points and enabled effective monitoring of person to determine if the patient's health deteriorated, improved, or stayed the same (stabilized)?*

Both Challenges Require the Same Solution: Healthcare Practitioner and Researchers require a method that gives them *'real time live data'* which does not require *'lengthy questionnaires and allows real time monitoring of the patients that indicates their wellbeing.'* This can only be achieved through a method such as handwriting rather than the use of traditional methods in collecting *'qualitive and quantitative data points.'* Handwriting is an 8-dimensional interaction of the Hand,

[7] Learning disabilities and dementia | Alzheimer's Society (alzheimers.org.uk)
[8] Mental health platform hubs – UKRI
[9] Helen Salisbury: The 10 minute appointment | The BMJ
[10] The answer is 17 years, what is the question: understanding time lags in translational research - PMC (nih.gov)
[11] How long does biomedical research take? Studying the time taken between biomedical and health research and its translation into products, policy, and practice | Health Research Policy and Systems | Full Text (biomedcentral.com)

Eye and Mind (HEM) and based upon Graphometry. [12] Handwriting is a brain impulse transmitted onto paper and this impulse reflects the quality of the patient's performance, behaviour, and health. If the patient deteriorates so will their performance and handwriting. If the medication is working effectively, the person's handwriting will improve and their performance or vice a versa [13].

Origin of HAST-Medicare

Introduction: B2BXB specializes in behavioural biometrics using existing pen and pad technology. B2BXB has developed Handwriting Analysis Software Test (HAST) based upon a Signature Verification in the 1990's using 4,500 samples of signatures from 256 people. B2BXB is the only business in the world that measures the interaction of the hand, eye and mind (HEM). HAST-Medicare measures in real time. As soon as the person finishes executing their intended graphic expression, the interaction results of how and why appear on the screen. This led to B2BXB developing a commercial product called HAST-Medicare that is designed to monitor a person's health by analysis of their handwriting or any other graphic expression the person wishes to execute (art, doodles, handwriting, printing, numerals or signatures).

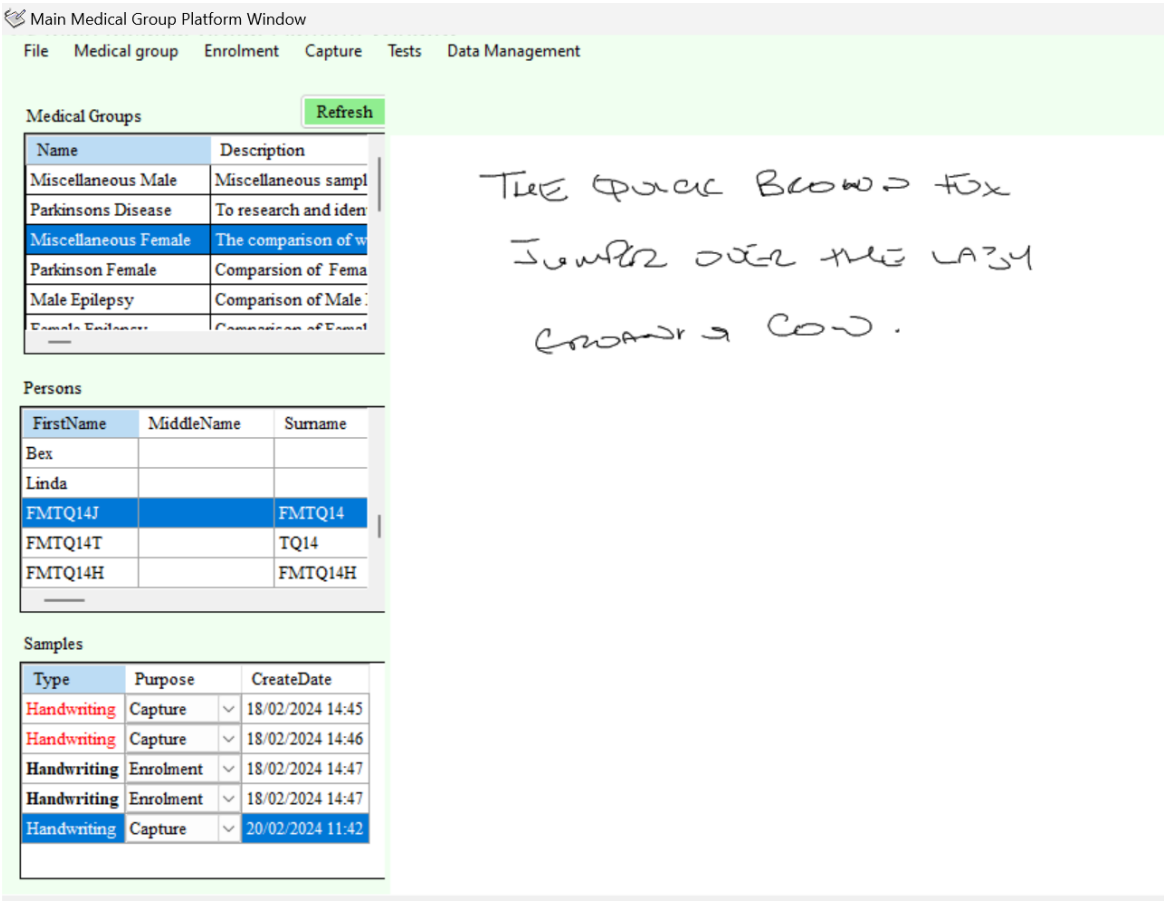

Figure 1. Screen Shot of HAST-Medicare Program

[12] DO NOT confuse Graphometry with Graphology. Graphometry is totally different and more scientific in its approach. The science of Graphometry is based upon standard mathematics and physics. Mathematical data cannot lie, it is objective and statistical that allows easy comparison, identification of commonalities or dissimilarities data points.

[13] Achieving Measured Outcomes and Measuring Mental Health by using Handwriting Analysis Software Test (HAST) by James Marshall Graphometrist 2024

Principle of HAST Applies to All Physical and Mental Illnesses

How does HAST Work? If I have 1,000 patients of a known medical condition, I have in effect 3,000 sets of mathematics. 2 handwriting samples for the template and 1 sample of handwriting for comparison. This means mathematical dominants can be easily calculated and a mathematical signature to that particularly medical condition is identified.

- Whether you are a healthcare practitioner, you create a group based upon the post code and search/reference the person by name and address as already used by medical practices. (This can be changed) You simply right click on a person to view their personal report.
- Whether you are a medical researcher, you create a research group and as many control groups as is required. You can search for participants according to your General Data Protection Rules (GDPR) protocols allow.

HAST-Medicare Compares the Person

HAST-Medicare compares the person / patient monitors their own performance and is able to provide 3 outcomes. The person / patient health has either improved, stayed the same or deteriorated. This makes sense if you think about it. If the person is feeling better, they will write better and vice versa. Another benefit of this approach is that Hast-Medicare data can be used for future research by comparing qualitative and quantitative data against handwriting data. This will establish other areas that must considered when identifying possible causes of Alzheimer's.

Why The Absolute Need for HAST-Medicare

HAST-Medicare is a Viable and Cost-Effective Solution: Both healthcare practitioners and medical researchers need a rapid access to data points regarding a patient's wellbeing.

- Handwriting is non-invasive, non-discriminatory, and an easy thing to do.
- Smart phone applications '*cannot provide*' the data points handwriting provides.
- HAST-Medicare is '*evidence based*' because it relies upon mathematics and provides objective data.
- HAST-Medicare is a medical monitoring software. It is a '*tool*' that provides mathematical data points for a healthcare practitioner to check as regards to a patient's wellbeing.
- The results indicate to the healthcare practitioner what questions to ask the patient. This inevitably saves time, money and other resources.
- HAST-Medicare is extremely simple to use with minimal training required.
- Anyone could use HAST-Medicare.
- By the time the patient has finished writing the results are on the screen. The patient writes '*The quick brown fox jumped over the lazy groaning cow.*'
- The healthcare practitioner /researcher does *not* have to be a handwriting expert. The results displayed in a format that any competent healthcare practitioner or researcher should understand.
- The data points are designed to help the healthcare practitioner or the researcher to investigate any medical condition or illness.
- HAST-Medicare provides measured outcomes regardless of who uses it.

- The fact that HAST-Medicare relies on mathematical evidence means that the data is automatically verifiable and can be easily checked by asking the person or by other comparative evidence.
- HAST-Medicare can be used via the desktop or via the cloud.

HAST-Medicare Datapoints

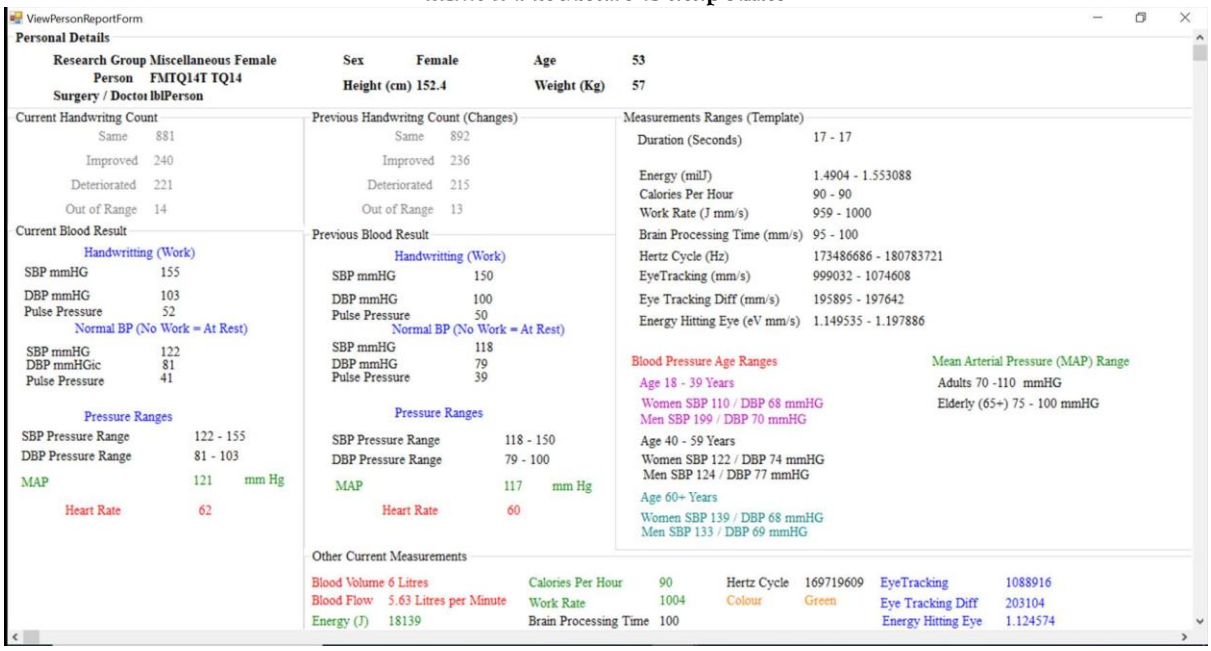

Figure 2. Shows HAST-Medicare Datapoints of 53-year-old woman

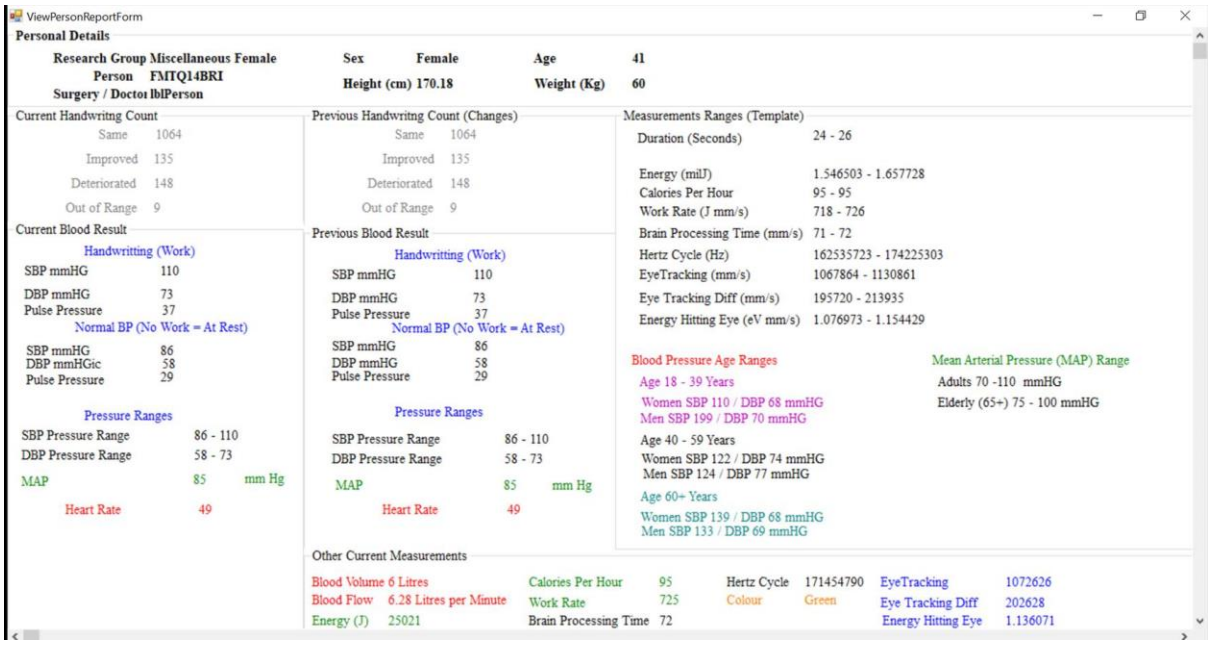

Figure 3. Shows HAST-Medicare Datapoints of 41-year-old woman

There are a combined 26 data points as shown below. This means that is 676 (26 x 26) possible variations regarding Alzheimer's Disease.

Anonymous Qualitative and Quantitative Date Points

1. Unique ID number
2. Sex
3. Their age
4. Their Nationality
5. Their Post Code
6. Occupation
7. Their Height
8. Their weight
9. Diet
10. Medication
11. Blood Group
12. Blood Pressure
13. Eyesight
14. Nationality

Real time Dynamic Data Points Calculated from Handwriting

15. Blood Pressures (MAP, SBP & DBP). (General Health, Hypertension and Hypotension)
16. Pulse Pressure (General Health, Hypertension and Hypotension)
17. Pulse Pressure Wave (General Health, Hypertension and Hypotension)
18. Body Mass Index (Obesity, Diabetic, Hypertension and Hypotension)
19. Heartbeat /Rate (General Health, Hypertension and Hypotension)
20. Blood Volume (General Health, Hypertension and Hypotension)
21. Blood Flow Rate (General Health, Hypertension and Hypotension)
22. Energy (General Health, Hypertension and Hypotension)
23. Calories Per Hour (General Health, Hypertension and Hypotension)
24. Work Rate (Alzheimer's, Parkinson's, Cancer, Depression, Intelligence)
25. Brain Processing Time (Alzheimer's, Parkinson's, Cancer, Depression, Intelligence)
26. Hertz Cycle (Alzheimer's, Parkinson's, Cancer, Depression, Intelligence)
27. Eye Tracking (Alzheimer's, Parkinson's, Cancer, Depression, Epilepsy, Intelligence)
28. Eye Tracking Difference (Alzheimer's, Parkinson's, Cancer, Depression, Intelligence)
29. Energy Hitting the Eye (Eyesight)
30. Colour (light wavelength)
31. Duration

The Purpose of Cerebrum Coin

Cerebrum Coin is a peer to peer (de-centralized) cryptocurrency that will be used to fund business expansion by funding research through different universities and healthcare providers who wish to offer monitoring service around the world. Doctors and healthcare providers need data to monitor a person's health and wellbeing. Researchers need qualitative and quantitative data to compare against monitoring data so that new procedures, new drugs, or alternative therapies can be considered or researched. The purpose of the Cerebrum Coin is to enable the public worldwide and professional investors to generate a revenue for themselves and to benefit from B2BXB research, data sharing and intellectual property that will be generated.

Existing Collaborations

B2BXB is already working with a University and Hospital in the UK and has requests for collaboration from Italy, Turkey, India, USA, and Greece. B2XB is currently in the process of evaluating collaborations with these countries.

Challenge of Getting Alzheimer's Data

Collecting Alzheimer's data and control data is very time consuming and expensive due to the type of illness B2BXB is focusing on. To overcome this challenge the Cerebrum Coin will be used to fund each country, starting with the UK. Once funding is established B2BXB will expand by having centres of excellence (Universities, Hospitals and Charities) across the world starting with Italy and India.

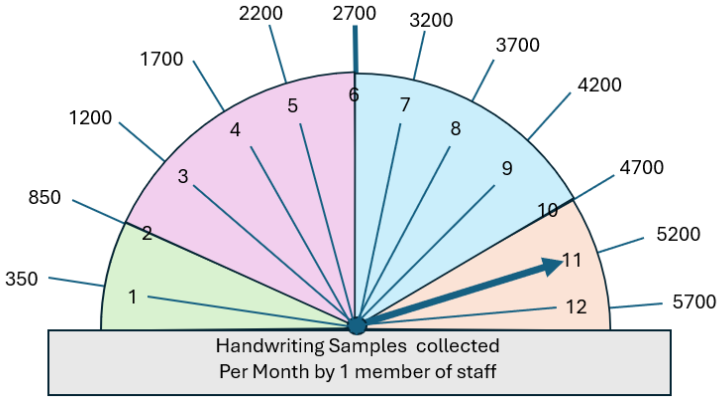

Figure 4. 1 Member of Staff Collecting Data

Figure 4 demonstrates 1 member of staff collecting Alzheimer's handwriting equates to 5,700 patients a year. If we have 4 members of staff (as shown in Figure 5) the rate of data collecting accelerates to 22,800 a year. This is based upon one country and would be the world's largest dynamic handwriting database (including qualitative and quantitative data). If we use the same number of staff in each named country UK, Italy, Turkey, India, USA, and Greece, the database will retain 114,000 Alzheimer's patients.

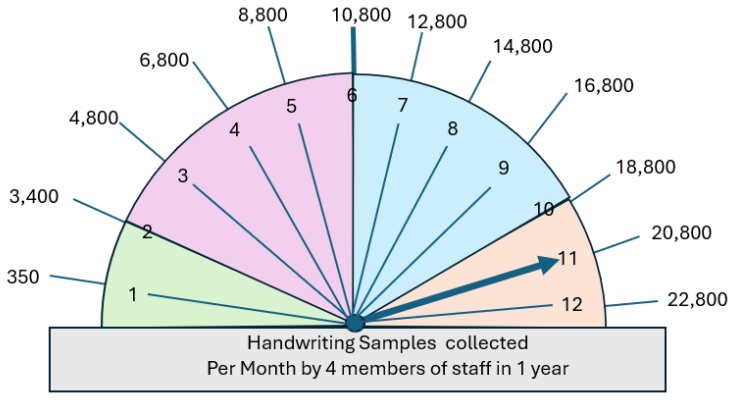

Figure 5. 4 Members of Staff Collecting Data

Sample Database Size

Each person will give 3 samples when enrolling on to the HAST-Medicare and if we had 114,000 worldwide patients, this would equal 342,000 samples of Alzheimer's handwriting. HAST-Medicare already retains the ability to execute an automated compare to establish dominants, similarities and dissimilarities. This data will be invaluable when writing research papers and evaluating future research.

Project Overview

Our aim is to make HAST-Medicare available to all countries that need to address the challenges of Alzheimer's Disease. By Monitoring a patient's health and rate of deterioration is essential in modern healthcare. Hospitals, Charities, Communities, Universities need to access to HAST-Medicare. The Cerebrum Coin will be used to fund domestic, international projects, exchange data, the effect of medication (new or existing), what alternative therapies can be used and identify what kind of support families need. The Cerebrum Coin enables independent research, and service can be offered on a global basis.

The Vision and Objectives

Alzheimer's is a very cruel disease that erodes a person's memory, dignity and ends in a very slow death. Alzheimer's does not discriminate between sex, religion or race. Cerebrum Coin enables all participants (investors) can financially benefit from our research, intellectual property and databases. By retaining the world's largest database of dynamic handwritings enables comparison with qualitative and quantitative databases of each country. Cerebrum Coin ensures that independent data is guaranteed, and all participants and investors obtain a direct benefit and financial reward.

Intellectual Property

The Cerebrum Coin will ensure that all intellectual property is protected whether it be copyright or patents. Intellectual property ensures that Cerebrum Coin is underpinned by real assets. Where B2BXB funds collaborative in different countries, the Cerebrum Coin will ensure that the intellectual property is owned by B2BXB and can be licensed to other parties. The intellectual property will generate additional revenue that will be used to increase the value of the Cerebrum Coin.

Cerebrum Coin dedicated Website

The Cerebrum Coin will have a dedicated website where news, papers, events, research and collaborations will be announced. This will give stakeholders and investors' confidence that Cerebrum Coin is having a real benefit helping Alzheimer's patients across the world.

The XRP / Ripple / Other Platforms [14], [15]

[14] Crypto Businesses | Ripple

[15] Best Crypto Exchanges and Platforms of 2024 [Licensed and Regulated]

The Cerebrum Coin will be placed on all 'peer to peer' decentralized platforms to increase the exposure in the marketplace. This ensures the global population has an opportunity to benefit from this real opportunity in real time.

Block Chain

Cerebrum Coin will use existing blockchain methods to ensure that security protocols are adhered too when investors trade the Cerebrum Coin / Token. Blockchain will also be used to safeguard medical records with a public and private key. This ensure the data is compliant with data protection regulations.

Distribution and Allocation of Cerebrum Coin

B2BXB will have 50,000,000,000 billion Cerebrum Coins available at £0.01p each, and this will ensure there is enough Cerebrum Coins on a global scale for investors, public and stake holders. B2BXB anticipates that with each project, the Cerebrum Coin will increase in value. B2BXB will offer project participants in different countries their own Cerebrum Coins to enhance their opportunity to generate additional revenue. This will be on a project-by-project basis.

Market Cap

B2BX will release 25 billion Cerebrum Coins and have a reserve of 25 billion Cerebrum Coins. The Market cap of the Cerebrum Coin is 250,000,000 million (multiplying the current price of a particular cryptocurrency by the total number of that cryptocurrency in circulation, 25,000,000,000 x 0.01 = 250,000,000 million).

Token Sale

The Cerebrum Coin Initial Coin Offer (ICO) will be priced at 1p each. This low price will encourage bulk purchase of Cerebrum Coins. Cerebrum Coins will be available on available on all platforms.

Admin Fee

B2BXB will charge 1% admin fee for each transaction.

Market Analysis

Cerebrum Coin is based upon the market research of B2BXB for HAST-Medicare which addresses the global challenge of Alzheimer's. Hospitals, Doctors, Private Healthcare Providers, Communities, Charities, and Universities are the natural marketplaces. The paper 'Blockchain in Health Care: Hope or Hype? [16] reveal that cryptocurrency and blockchain [17] methodology is seriously being considered as a means of providing healthcare. There is no reason why Cerebrum Coin cannot lead the way on this. B2BXB has no direct competitors in behavioural biometrics.

[16] Blockchain in Health Care: Hope or Hype? - PMC

[17] 4 - Blockchain applications for the healthcare sector: Uses beyond Bitcoin

Competitive Analysis

B2BXB is the only expertise in the world that measures Hand, Eye and Mind simultaneously when measuring and monitoring Alzheimer's. In this sense B2BXB has no direct competition and this is one clear advantage why people should invest in the Cerebrum Coin. As regards to indirect competition, smart phones and watches are not competition as these electronic gadgets cannot monitor the patient's health as HAST-Medicare has shown earlier in this white paper.

Roadmap

- The Cerebrum Coin is backed by solid research and development of HAST-Medicare.
- There is an absolute need for Alzheimer's monitoring, and this may include the issue of 'Assisted Dying' in the UK which is currently going through the UK Parliament.
- HAST-Medicare is fully developed application.
- B2BXB is already working with a red brick University.
- B2BXB has an Italian Hospital, Turkish Hospital, Greek Universities and India Hospital who are seeking collaboration with B2BXB.

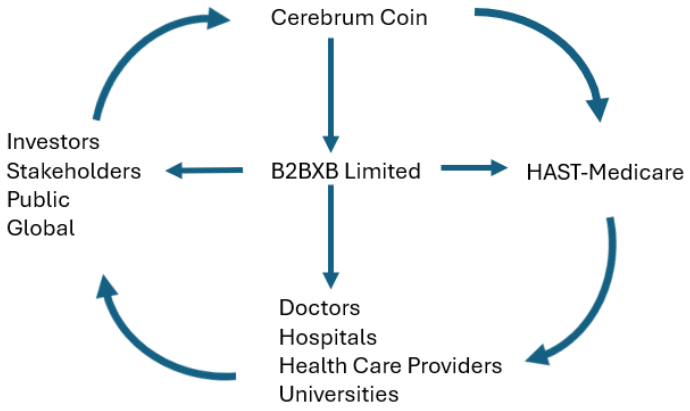

Figure 6. Showing monetization roadmap of the Cerebrum Coin Project

Development Stages

As already mentioned, HAST-Medicare is a commercially available product under a monthly subscription license.

Marketing of Cerebrum Coin

Figure 7 Social Media

B2BXB will utilize all global social media platforms to market the Cerebrum Coin. B2BXB will also offer research institutions, charities, and organizations Cerebrum Coins to trade but also

benefit from direct funding from B2BXB. This strategy will ensure global communities and hospitals will be able to benefit from the Cerebrum Coin.

Monetization

- B2BXB will license HAST-Medicare on monthly subscription to Universities, Hospitals, Healthcare providers, Charities and other organizations to generate additional revenue.
- B2BXB will license HAST-Medicare Database (qualitative and quantitative only) on monthly subscription to other researchers (universities globally) or organizations to generate additional revenue.

B2BXB Team Members

James Marshall Managing Director
Darren Woodcock Sales Director
Aaron Smyth Marketing Director
Tanveer Alam Technical Director

Other roles will be filled as when they arise. For example, Nurses to collect handwriting samples from Alzheimer's patients.

Legal Considerations

B2BXB will ensure that all projects are compliant with the laws of the country that is collaborating. This includes taxation and anti-money laundering laws and data protection laws.

Risk Factors

Due to Cerebrum Coin being backed by B2BXB research and development of HAST-Medicare and that there is an absolute need for monitoring Alzheimer's worldwide. B2BXB sees Cerebrum Coin low risk due to B2BXB has put its money where its mouth is and is a world leader in its knowledge and expertise.

Summary: HAST-Medicare is designed to save time, money, and resources for healthcare practitioners and to cut '*bench to bed*' time for medical researchers. By not having the ability to gather data points quickly, increases patient and hospital costs, time, and resources. HAST-Medicare allows effective monitoring of medication. HAST-Medicare also helps Researchers to understand the commonalities, dissimilarities, and compare *qualitive and quantitative data points in Alzheimer's patients. HAST-Medicare will speed up pilot studies, pre-clinical trials, clinical trials, and deployment of new drugs, therapies or treatments.* HAST-Medicare should be used in every surgery, hospital, healthcare provider and university on a global scale. Cerebrum Coin will lead the world and guarantee that all people in all communities will have access to healthcare on a global scale.

Figures:

Figure 5. 4 Members of Staff Collecting Data
Figure 6. Showing monetization roadmap of the Cerebrum Coin Project
Figure 7. Social Media

Other Reading:

1. What is dementia - NHS (www.nhs.uk)
2. Alzheimer's Disease by Petra Nowotny, Jennifer M Kwon, Alison M Goate, Washington University School of Medicine, Saint Louis, Missouri, USA, ENCYCLOPEDIA OF LIFE SCIENCES / & 2001 Nature Publishing Group / www.els.net
3. *Bright light exposure reduces TH-positive dopamine neurons: implications of light pollution in Parkinson's disease epidemiology* March 2013 Stefania Romeo1, Cristina Viaggi2, Daniela Di Camillo3, Allison W. Willis4, Luca Lozzi3, Cristina Rocchi1, Marta Capannolo1, Gabriella Aloisi1, Francesca Vaglini2, Rita, Matteo Caleo5, Cristina Missale6, Brad A. Racette4, Giovanni U. Corsini2 & Roberto Maggio11Biotechnological and Applied Clinical Sciences Department, University of L'Aquila, 67100 L'Aquila, Italy, 2Department of Translational Research on New Technologies in Medicine and Surgery, University of Pisa, 56100 Pisa, Italy, 3Department of Physical and Chemical Sciences, University of L'Aquila, 67100 L'Aquila, Italy, 4Department of Neurology, Washington University School of Medicine, St. Louis, Mo., USA, 5CNR Neuroscience Institute, 56100 Pisa, Italy, 6Department of Molecular and Translational Medicine, University of Brescia, 25123 Brescia, Italy.
4. *Photon Induced Visual Abnormalities* (PIVA) and Visual Dyslexia Michael C. Parker1, P.E. *October 20, 2005,*
5. http://www.livescience.com/3930-picture-living-human-retina-reveals-surprise.html James Fulton Vision Concepts (2014)
6. *Motor control: Mechanisms of motor equivalence in handwriting* Prof. Alan M. Wing © 2000 Elsevier Science Ltd
7. *How fast is the speed of thought?* Martin J. Tovee, Psychology Department, Ridley Building, Newcastle University
8. *Diabetes (Fatigue), Heart Malfunctions, Alzheimer's, Depression, Eye Strain, Addictions, Mental Illness, Mental Illnesses* (Bipolar, schizophrenia etc (Advanced Graphology Volume II Renna Nezo 1993)
9. *Huntingdon Disease* Handwriting Analysis Karen Amend & Mary S Ruiz 1980
10. *Mental Illnesses* Bipolar, schizophrenia etc (Handwriting Analysis Karen Amend & Mary S Ruiz 1980
11. *Cancer In Handwriting* Dr. Kanfer
12. **http://home.wmin.ac.uk/marketingresearch/2189kanfer.htm**
13. *Neuroscience Methods*, 52(1), pp.39-45. Mavrogiorgou, P. (2001). Kinematic analysis of handwriting movements in patients with obsessive-compulsive disorder. *Journal of Neurology, Neurosurgery & Psychiatry*, 70(5), pp.605-612.
14. Mergl, R., Juckel, G., Rihl, J., Henkel, V., Karner, M., Tigges, P., Schroter, A. and Hegerl, U. (2004). *Kinematical analysis of handwriting movements in depressed patients. Acta Psychiatrica Scandinavica*, 109(5), pp.383-391.
15. Schröter, A., Mergl, R., Bürger, K., Hampel, H., Möller, H. and Hegerl, U. (2003). *Kinematic Analysis of Handwriting Movements in Patients with Alzheimer's Disease*, Mild Cognitive Impairment, Depression and Healthy Subjects. *Dementia and Geriatric Cognitive Disorders*, 15(3), pp.132-142.
16. Tigges, P., Mergl, R., Frodl, T., Meisenzahl, E., Gallinat, J., Schröter, A., Riedel, M., Müller, N., Möller, H. and Hegerl, U. (2000). *Digitized analysis of abnormal hand–motor performance in schizophrenic patients. Schizophrenia Research*, 45(1-2), pp.133-143
17. *Advanced Graphology* Renna Nezos 1993
18. *The Repeatability of Signatures* R. M. Guest 2004 Canterbury University Kent
19. *Handwriting as an objective tool for Parkinson's disease diagnosis Sara* Rosenblum, Margalit Samuel, Sharon Zlotnik,Ilana Erikh, Ilana Schlesinger J Neurol (2013)
20. Parkinson's disease patients undershoot target size in handwriting and similar tasks *J Neurol Neurosurg Psychiatry 2003* A W A Van Gemmert1 C H Adler2, G E Stelmach1
21. *History of the Western European Alphabet* Judy Ross 2007
22. *The History of the Alphabet* Mark Damen 2007

23. Dalibor Kučera, Jana Havigerová '*Handwriting in Diagnostic Perspective*' 2011
24. *A Simplified Guide to Forensic Document Examination* National Forensic Science Technology Center 2013 Becky Carter
25. *Poor Handwriting*: A Major Cause of Underachievement Dr. Linda Silverman 2005
26. *Attention & motor skills in children at risk of dyslexia* Debbie Gooch 2013
27. *Handwriting and Dyspraxia* Lois M Addy MA (Ed) BSc (Hons) Psych. Dip COT SROT Senior Lecturer. School of Professional Health Studies. York St. John College 2005
28. *Micrographia as a focal sign of neurological disease* P A Lewitt 2014
29. *Effects of Intoxication on Handwriting* K. S. Puri 2013
30. *The Pathology of handwriting as a result of Drug Abuse*. a case study V. G. Băncilă 2014
31. *The Left-Handed Writer* Charles H Trafford 1987.
32. *Handwriting: Guide to Complete Instruction*, Charles H Trafford, Rand H Nelson Peterson Directed Handwriting 2003
33. *Dyslexia* (what parents ought to know) Vera Quin
34. *Handwriting Analysis* by Karen Amend and Mary S. Ruiz 1980
35. *Dysgraphia in Children: Lasting Psychomotor Deficiency or Transient Developmental Delay?* Bouwien C. M. Smits-Engelsman and Gerard P. Van Galen 1997