AppDe.io

APPDE TECHNOLOGIES WHITEPAPER

VERSION 6.4

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AppDe.io

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INTRODUCTION

This whitepaper relates to the proposed technologies of AppDe Technologies. The purpose of this paper is to lay out a clear and decisive roadmap for the company in achieving sustainable and successful business collaborations with stakeholders in the industry.

This content of this paper is structured in accordance with the table of content section below. However, this document is confidential and has been made available to the management of the company strictly on the understanding that its contents will not be disclosed or discussed with third parties except for the company's own professional advisors.

EXECUTIVE SUMMARY

AppDe Store (AppDe.io) is an online eco-system built on blockchain which houses memory related games and applications that are developed to mitigate or improve the well-being of patients with dementia and serve as a memory training platform for users interested in memory improvement as well as mastering advanced memory techniques such as memorizing the content of an entire book.

The app platform is opened to third-party software developers who may be interested in registering and listing their apps on the platform. Every app available on the platform will be integrated with blockchain smart contract to eligible users to earn rewards in the form of AppDeCoins (APPDE). This mechanism involves digital assets and two or more parties, where some or all of the parties' deposit assets into the blockchain smart contract and the assets automatically get redistributed among those parties according to the algorithm of AppDe's API and smart contract

The uniqueness of AppDe Technologies is highlighted by:

- Its' innovative and diversified product offering which addresses the needs of its target market— patients living with memory-related health conditions and individuals interested in enhancing their memory at an advanced level.

- Its' robust blockchain technical API to enable developers with zero blockchain knowledge to use the unique features of blockchain and securing data on a non-central server.

- Its' formation of a core team of experienced professionals in blockchain technology and experts in memory.

- Its' free and transparent copyrights to developers when games are uploaded to AppDe Store.

- Its' reusable game assets - Tokens can be reused, bought, and sold outside of the game through blockchain wallets, unlike conventional games.

- Its' unstoppable games made possible by a decentralized system running on a blockchain.

The viability of the company's product offering is backed up by the potential of the global memory improvement and memory training market.

Today, the world's older population continues to grow at an unprecedented rate. Statistics show that 8.5% of people worldwide (617 million) are 65 years and over. Interestingly this figure is projected to grow to 1.6 billion by 2050. As the population in this demographic bracket ages, there remains a need to maintain brain health and manage declining memory functions. Thus, various sectors such as healthcare, corporate, and education sectors are increasingly promoting the adoption of memory tools and brain fitness exercises that use gamification to assess and improve the memory functionality of users. Moreover, the growing global awareness about brain fitness has also created an industry of its own in the competitive world of memory championships.

AppDe Technologies understands that blockchain technology is a trend of the future and has therefore innovatively developed a blockchain-based app store and a memory training service (MemoryPLUS and MemoryHack™) to meet the needs of users looking to improve or develop their memory capacity. The reason why blockchain is effective is that of its decentralized system where anyone, including the developers and users, can analyze the code used in blockchain games. This brings transparency and puts players and creators on the same side. In addition, blockchain allows games to be unstoppable, unlike conventional games that run on the centralized server which can be discontinued for various reasons. In blockchain, the data is secured by the fact that there is no reliance on a central point of storage, reducing the risk of it being lost or destroyed. Attacking one point of storage would result in no loss of data since all the information is stored on multiple devices around the world.

In the same context, blockchain is trustworthy due to its decentralized digital rights and data management. Blockchain technology ensures the security and privacy of data. Most data are stored in centralized servers that are often the target of cyber attackers. Blockchain, on the other hand, restores the control of data to the individuals generating the data making it an uphill task for cybercriminals to access and manipulate data on a large scale.

Apart from that, the mind games are generally beneficial in these few aspects, namely fast decision making, innovation and increased brain power. This is shown by a research that scientists found that the working memory of participants who had engaged in the dual n-back task, which involves receiving visuospatial and auditory information, simultaneously had improved by 30 percent. The same participants also displayed changes in the activity of the prefrontal cortex, which is a brain region highly implicated in attention and memory. [1]

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[1] 1. *Dementia.* **Seth A. Gale, MD, Diler Acar, MD, Kirk R. Daffner, MD.** 2018, Elsevier Inc. .

The prefrontal cortex has a critical role in memory retrieval. There is growing evidence that the PFC is involved not only in frontal lobe-type dementias, but also Alzheimer's disease, mild

2. **Hindawi International Journal of Alzheimer's Disease.** *Trends in Alzheimer's Disease and Dementia in the Asian-Pacific Region.* **[Online] [Cited: April 10, 2020.] https://www.hindawi.com/journals/ijad/2012/171327/.**

3. **Monica Cations, Gorjana Radisic, Maria Crotty, Kate E. Laver. What does the general public understand about prevention and treatment of dementia? A systematic review of population-based surveys.** *Plos One.* **[Online] April 19, 2018. [Cited: April 18, 2020.] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0196085.**

4. *Learning to remember: cognitive training-induced attenuation of age-related memory decline depends on sex and cognitive demand, and can transfer to untrained cognitive domains.* **A.Bimonte-Nelsonab, Author links open overlay panel Joshua S.Talboomab Stephen G.Westab Elizabeth B.Engler-Chiurazziab Craig K.Endersalan Craina Heather. 2014, Vols. 35(12) pg 2791-2802.**

5. **Businesswire.** *Global Cognitive Assessment and Training Market 2020-2024 | 33% CAGR Projection Over the Next Five Years.* **London : s.n., 2020.**

6. **Cognitive Assessment And Training Market: An Incisive, In-depth Analysis on the Cognitive Assessment And Training Market. [Online] 2018. [Cited: April 11, 2020.] https://www.futuremarketinsights.com/reports/cognitive-assessment-and-training-market.**

7. *Computerized training of working memory in children with ADHD--a randomized, controlled trial.* **Klingberg T1, Fernell E, Olesen PJ, Johnson M, Gustafsson P, Dahlström K, Gillberg CG, Forssberg H, Westerberg H. 2005, Vols. 44(2):177-86.**

8. **Global Dementia Care Products Market – Industry Analysis and Forecast (2020-2027) –By Product Type, End-User and Region.** *Maximize Market Research .* **[Online] Jan 2020. [Cited: April 16, 2020.] https://www.maximizemarketresearch.com/market-report/global-dementia-care-products-market/24987/.**

9. **Dementia costs Singapore $1.4b a year.** *Straits Times .* **[Online] May 2, 2016. [Cited: April 17, 2020.] https://www.straitstimes.com/singapore/health/dementia-costs-singapore-14b-a-year.**

10. *Detailed analysis of the supermarket task included on the Japanese version of the Rapid Dementia Screening Test.* **Mimura, Yasushi Moriyama Aihide Yoshino Taro Muramatsu Masaru. 2016.**

https://www.ncbi.nlm.nih.gov/pubmed/17853981

cognitive impairment, and normal aging.[2] As a result, mind games can help accelerate learning as the working memory can be improved enormously. This could be one of the long-haul journey games that is not only entertaining but beneficial to cognitive development. Distance learning can also be incorporated as the games are easily accessible via AppDe instead of face-to-face learning and consulting.

AppDe Technologies is owned privately and will perform crowd sales of $10 million through ICO sales to fund the launching of the business. This funding will allow the company to invest in developing its blockchain-based app store and memory training centers across the world. Based on financial projections, the company is expected to break even by the third year of operation.

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[2]https://www.medicalnewstoday.com/articles/319794.php

COMPANY SUMMARY

Company Overview

AppDe Technologies is a blockchain app store that aims to provide blockchain-based platform for memory related games and applications that are developed to mitigate or improve the wellbeing of patients with dementia. AppDe.io will also serve as a memory training platform for users interested in mastering advanced memory techniques such as memorizing the content of an entire book. It is also providing innovative products, training programs, and charitable services geared towards improving and boosting memory health. The company was founded as a private limited company in 2019 and it is currently headquartered in Singapore. The company is currently looking to perform crowd sales of $10 million through token sales to pursue the company's visionary plans of developing its core offerings and scaling the company into a global brand.

Business Objectives

AppDe Technologies' products and services are geared towards improving the memory capacity of patients with dementia and transforming normal users into super brains with advanced memory capabilities in addition to the 22 international grandmasters, 154 grandmasters, and 149 international masters in the world[3].

The company aims to achieve the following objectives within the first 5 years of its' operations:

● To continue investing in the development of the AppDe Technologies' core products and programs which are aimed at increasing the company's user base and name recognition, which will ultimately lead to having a favorable market position.

● To forge strategic B2B partnerships with game developers and other relevant corporate players (especially in key international markets), which will increase the global reach of the AppDe store platform.

● To employ more talented blockchain software developers and certified memory consultants into the company's workforce.

● To work closely with dementia associations and education partners to reach more users.

● To invest in growing the AppDe store to become a global app store in the memory improvement and training niche.

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[3]https://en.wikipedia.org/wiki/Grand_Master_of_Memory

Mission

The mission of AppDe Technologies is to develop a world-class blockchain-based app store for improving the memory capacity of patients with dementia, and a memory training academy for teaching people proper memorization techniques for developing super brains. AppDe Technologies will also position itself as a socially responsible company offering charitable services in different local communities.

Corporate Strategy

The corporate strategy of the company involves the following:

● To start with a big group of users and grow rapidly by doing bounty and air drop programmes. Bounties and airdrop enable big number of AppDe Store Platform downloads including the usage of the apps.

● To solve problems in games and app development industry, pay-per-play reduce the cost of not utilizing the service. Pay-per-download is costly and does not ensure user satisfaction. Pay-per-play is more cost effective to users.

● To create a secure environment for caregivers and users to interact.

● Gaining market shares via the effective utilization of marketing strategies such as word of mouth, referral marketing and networking.

● Organizing post-ICO referral programs geared towards driving sustainable sales.

● To build business relationships with industry stakeholders and solidify the company's brand values.

● To operate professionally in a socially and ethically responsible manner.

Corporate Goal

● Developing mechanisms that support professionalism, customer satisfaction and wider market reach.
● Continuing to manage and grow AppDe's brand successfully while expanding into other complimentary markets in the memory training software, training, and education industry.
● Improving the memory capacity of dementia patients and training students in our memory training centers to have super brains.

Corporate Governance

Principle: Key management personnel are to provide leadership, vision, competency, and accountability to lead and grow the company.

● Providing entrepreneurial leadership, set strategic directions and overall corporate policies of AppDe;

● Ensuring the adequacy of internal controls, risk management and periodic reviews of the AppDe's technical performance and growth.

● Setting AppDe's values and standards, ensuring that the necessary human resources are in place; and

● Assuming responsibility for good corporate governance practices.

Board of Directors will take extreme care in adopting top security measures, with the use of multi-sig wallets and cold storage to ensure contributions are handled safely. These measures are also regularly reviewed by the Management Team. We would consider exploring the use of a custodian account, escrow services and third party security storage as and when the cryptocurrency market services matures and diversify.

THE PROBLEMS AND MARKET OPPORTUNITIES

Problems Overview

There are 2 major problems that AppDe Technologies focus to solve, namely: The dementia market and the memory training market (for students and professionals). AppDe is designated to deliver solutions for these problems by building AppDe Platform.

Dementia is increasing fast in Asia placing a huge burden on a growing army of care-givers, who are mainly family members. Jane Parry and Cui Weiyuan report on how dementia is starting to receive the recognition it deserves.

Bulletin of the World Health Organization 2011; 89:166–167. doi:10.2471/BLT.11.020311

Yin Jiliang, 73, looked forward to retirement as a time when he and his wife Su Zhiying, 76, could relax and enjoy the fruits of their labour, but instead he has another full-time job – taking care of his wife, who was diagnosed with dementia in 2001.

"Every morning I get up at six, and I prepare myself well before waking her up at seven. The first thing to do is to take her to the toilet. She is no longer able to use the toilet alone," says Yin. He also helps Su brush her teeth, have a wash, take a walk, eat a meal. Su is unable to do any of these things independently.

Photo courtesy of Alzheimer Disease Chinese

Yin Jiliang and his wife Su Zhiying at an award ceremony for Excellence in Home Care for People with Dementia in Beijing, China

"She eats very slowly, about one hour on average per meal. Sometimes I doze off sitting at the table while she has her meal," he explains. "Every night I set the alarm for 3.30 a.m. to wake her up to pee. Afterwards I often can't get back to sleep, making sleep deprivation the most difficult thing for me."

Su is fortunate that her loving husband is able to take care of her, and Yin says their adult children, family and friends are sympathetic and supportive. Living in Beijing, the couple can also receive specialist care at the Dementia Care and Research Centre at Peking University's Institute of Mental Health. There Yin can tap into a network of others caring for people with dementia.

"It's nice to get to know and to talk to other relatives and to be able to share experiences with them. Some relatives complain that the partners they take care of are extremely difficult to deal with. In that sense, I am lucky. My wife is the over-happy type and seldom makes any trouble," he says.

China's population is ageing fast. Life expectancy in China has gone from 68.4 years in 1990 to 73.8 in 2008; combined with the one-child policy this development will lead to a massive demographic shift in the coming decades. The elderly support ratio, the number of people in the population aged 15 to 64 divided by those aged 65 and above, which was 1:9 in 2010 will become 1:3 by 2050, China's Population Research Bureau predicts. The proportion of over-65s to China's total population is estimated to rise from 7.8% in 2005 to 16.3% in 2030, according to data from the Organisation for Economic Co-operation and Development.

China has recognized that dementia will be a significant problem associated with an ageing population, but current initiatives will have to be scaled up fast to meet growing demand. So far there is not even a national estimate of the burden of dementia.

"There is a great challenge to get dementia on the health policy agenda, but much has been achieved in the past decade," says Dr Huali Wang, vice chair and vice secretary-general of Alzheimer's Disease Chinese (ADC). This research and advocacy organization is working to get dementia higher up on the health policy agenda.

Alzheimer disease is the most common cause of dementia, but it is often used as an umbrella term for several conditions causing dementia.

"Dementia care was listed as one of the priorities of mental health services in the Mental Health Plan 2002–2010 and ADC is currently working with the medical community to get it included in the upcoming Major Mental Health Plan," explains Wang. "The government has realized the burden of dementia … but we need to take action to get a general estimate and we also need more investment in educating the media and government," she says.

China's experience with this pressing public health issue is just one of several in Asia. Of the 35 million people currently living with dementia globally, 58% live in low- and middle-income countries and by 2050 this figure is projected to reach 71% of the total. Eastern Asia and southern Asia will see dementia growth rates more than double in the coming 20 years, Latin America will see increases of 134% to 146% and North Africa and the Middle East can expect a 125% rise, according to research by Alzheimer Disease International (ADI).

High-income countries already have a sense of the cost of dementia. In 2010, north America and western Europe accounted for over two-thirds of the estimated US$ 604 billion worldwide cost of dementia, attributed almost equally to the indirect costs of informal care and the direct costs of medical and social care. In the rest of the world, informal caregivers bear the brunt of the burden, medical and social support are underdeveloped or non-existent and the enormity of the looming dementia epidemic is not yet widely appreciated.

In the Asia Pacific region, only Australia, Japan and the Republic of Korea have formulated public health policies directly targeting the burden of dementia. Yet it is China and India that account for the lion's share of dementia prevalence in the region. Like China, India is waking up to this.

"It took quite some time to convince the officials of the need to include dementia in the list of conditions eligible for government support," says Dr K Jacob Roy, national chairman of the Alzheimer and Related Disorders Society of India. "Our goal is to make dementia a national health priority, considering the fact that there are over 100 million people over 60 years of age and 3.7 million people with dementia."

"The problem is that dementia is not yet integrated in primary care arrangements and it needs to be in the future," says Marc Wortmann, executive director of ADI. The job of identifying elders showing signs of dementia usually falls on relatives. This is particularly so in countries where primary health care is underdeveloped and screening programmes for cognitive decline cannot be implemented.

"In most parts of the world most people with the disease go undiagnosed," says Wortmann. "One of the problems in developing countries is … [the] lack of a primary care system."

A recent WHO initiative to encourage countries to pay more attention to mental health problems is the mental health Gap Action Programme (mhGAP).

The WHO mhGAP Intervention Guide was launched in October 2010. It is for use by health-care workers in the management of a range of mental disorders, including dementia. There are simple protocols and flowcharts, providing a guidance process for diagnosis and descriptions of psychosocial interventions including those for caregivers. Implementation of the programme has begun in a few countries, including Ethiopia, Jordan, Nigeria, Panama and Sierra Leone.

"In low- and middle-income countries specialist numbers are never going to be enough, and dementia care will need to involve community health workers, primary care doctors and nurses in a community-based programme," says Dr Tarun Dua, a medical officer in WHO's Evidence, Research and Action on Mental and Brain Disorders unit.

The term "Alzheimer's" was coined by Emil Kraepelin in 1910, in honour of his colleague Alois Alzheimer. A doctor at Frankfurt's state asylum, Alzheimer studied a 51-year-old woman, known as Auguste D, who exhibited cognitive and language deficits and experienced hallucinations and delusions that made her both paranoid and aggressive. Five years later he got the chance to examine her brain and found it had shrunk dramatically and that there were abnormalities in and around the cells.

"While the scale of the global dementia epidemic is daunting, the wide variety of responses at the grassroots level is cause for optimism", says Wortmann. A host of creative interventions are being developed, from children in China's Hong Kong Special Administrative Region being trained at school to spot dementia in their grandparents, to a low-cost, home-based intervention in India to support families of people with dementia using locally available resources.

"My optimism has to do with the fact that we can do more than people think, we can use psychosocial interventions to give people a better quality of life, and there is enough in the pharmaceutical pipeline to assume that medical research will find something," he says.

But in terms of developing dementia policies, most of the action is still in Europe. "Developments in India are promising but we need to do more in Asia," says Wortmann. "Public awareness is growing but in most countries governments are not picking up on that and starting programmes."

https://www.alzforum.org/news/research-news/world-alzheimer-report-2015-revised-estimates-hint-larger-epidemic

According to the WHO, in 2020, around 50 million people have dementia, and there are nearly 10 million new cases every year. With new data to project how many will develop dementia and at what cost, the report bumps up the scale of the coming epidemic by 12 to 13 percent from previous estimates.

"We are looking at roughly a doubling in the numbers every 20 years," said Martin Prince, King's College London. However, Prince added, "This trajectory of growth may be changed by efforts to do more to prevent the onset of dementia." In 2009, the ADI predicted that 65.7 million people would have dementia in 2030, rising to 115.4 million in 2050. The 2015 report revises that projection with data from 106 additional studies, which better cover East Asia, sub-Saharan Africa, North Africa, and the Middle East.

Prince and colleagues now estimate that 74.7 million people will have dementia in 2030, and 131.5 million in 2050. The authors noted that these changes do not reflect trends toward increasing or decreasing dementia in certain regions, only better sampling. With the new data, prevalence in the population older than 60 now appears similar across world regions, said Prince. As predicted in 2009, low- and middle-income countries will be disproportionately affected due to more rapid population aging. Right now, 58 percent of dementia sufferers live in these countries; they will make up an estimated 63 percent of the total in 2030, and 68 percent in 2050.

Estimated prevalence of dementia for those aged 60 and over, standardised to Western Europe population, by GBD region
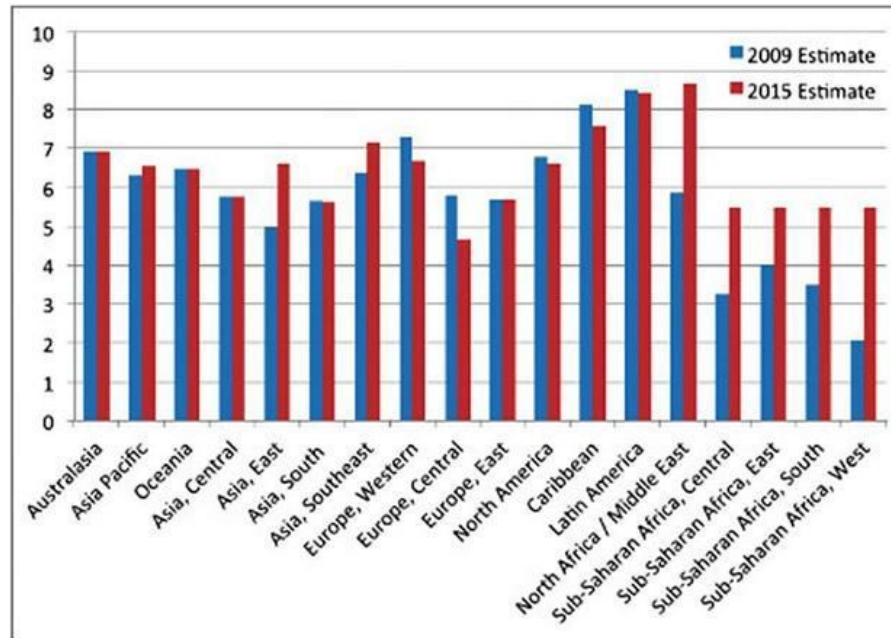
Estimated prevalence of dementia for people over 60. (percentage of population)
World Alzheimer Report 2015, ADI. pp22

Dementia in the Asia Pacific Region

Alzheimer's Disease International

Estimated number of people with dementia in the Asia Pacific region

	Projected Population ('000)+	Estimated Number of people with Dementia ('000)		
	Y2015	Y2015	Y2030	Y2050
ADI Members				
Australia	23,923	328	520	864
Bangladesh	160,411	460	834	2,193
China, P.R.	1,401,587	10,590	18,116	32,184
China, Hong Kong SAR	7,314	115	212	436
China, Macau SAR	584	4	11	26
Chinese Taipei	23,380	260	461	840
India	1,282,390	4,031	6,743	12,542
Indonesia	255,709	1,033	1,894	3,979
Japan	126,818	3,014	4,421	5,214
Malaysia	30,651	123	261	590
Nepal	28,441	78	134	285
New Zealand	4,596	60	96	154
Pakistan	188,144	450	712	1,422
Philippines	101,803	301	568	1,149
Singapore	5,619	45	103	241
Republic of Korea	49,750	462	974	2,113
Sri Lanka	21,612	147	262	463
Thailand	67,401	600	1117	2,077
ADI members total	**3,780,133**	**22,100**	**37,438**	**66,772**
Non ADI members*	211,660	1,179	1,970	4,209
Total Asia Pacific	**3,991,793**	**23,279**	**39,409**	**70,981**

Dementia in the Asia Pacific Region, Nov 2014, ADI. pp4

Total population over 60, crude estimated prevalence of dementia (2015), estimated number of people with dementia (2015, 2030 and 2050) and proportionate increases (2015-2030 and 2015-2050) by GBD world region

GBD Region	Over 60 population (millions, 2015)	Crude estimated prevalence (%, 2015)	Number of people with dementia			Proportionate increases (%)	
			2015	2030	2050	2015-2030	2015-2050
ASIA	485.83	4.7	22.85	38.53	67.18	69	194
Australasia	5.8	6.7	0.39	0.62	1.02	59	163
Asia Pacific High Income	52.21	7.0	3.64	5.68	7.81	56	115
Oceania	0.64	3.5	0.02	0.04	0.09	83	289
Asia, Central	7.43	4.2	0.31	0.44	0.88	43	184
Asia, East	218.18	4.5	9.77	16.60	28.64	70	193
Asia, South	139.85	3.7	5.13	8.61	16.65	68	225
Asia, Southeast	61.72	5.8	3.60	6.55	12.09	82	236
EUROPE	176.61	5.9	10.46	13.42	18.66	28	78
Europe, Western	107.89	6.9	7.45	9.99	14.32	34	92
Europe, Central	26.92	4.0	1.07	1.39	1.90	30	78
Europe, East	41.8	4.6	1.94	2.03	2.44	4	26
THE AMERICAS	147.51	6.4	9.44	15.75	29.86	67	216
North America	74.88	6.4	4.78	7.28	11.74	52	145
Caribbean	5.78	6.5	0.38	0.60	1.07	60	183
LA, Andean	5.51	6.1	0.34	0.64	1.43	88	322
LA, Central	26.64	5.8	1.54	2.97	6.88	93	348
LA, Southern	9.88	7.6	0.75	1.15	2.05	52	172
LA, Tropical	24.82	6.7	1.66	3.11	6.70	88	305
AFRICA	87.19	4.6	4.03	6.99	15.76	74	291
North Africa / Middle East	38.93	6.0	2.34	4.35	10.04	86	329
SSA, Central	4.78	3.3	0.16	0.26	0.54	60	238
SSA, East	19.86	3.5	0.69	1.19	2.77	72	300
SSA, Southern	6.06	3.9	0.24	0.35	0.58	46	145
SSA, West	17.56	3.1	0.54	0.85	1.84	58	241
WORLD	897.14	5.2	46.78	74.69	131.45	60	181

World Alzheimer Report 2015, ADI. pp24

INFOGRAPHIC

The global impact of dementia

Around the world, there will be 9.9 million new cases of dementia in 2015,
one every 3 seconds

46.8 million people worldwide are living with dementia in 2015.
This number will almost double every 20 years.

46.8 million — 2015
74.7 million — 2030
131.5 million — 2050

68% 2050

Much of the increase will take place in low and middle income countries (LMICs): in 2015, 58% of all people with dementia live in LMICs, rising to 63% in 2030 and 68% in 2050.

US$ 818 BILLION — 2015

US$ 1 TRILLION — 2018

The total estimated worldwide cost of dementia in 2015 is US$ 818 billion. By 2018, dementia will become a trillion dollar disease, rising to **US$ 2 trillion by 2030**

If global dementia care were a country, it would be the **18th largest economy** in the world exceeding the market values of companies such as Apple and Google

Apple $742 billion

Google $368 billion

Dementia $818 billion

(source: Forbes 2015 ranking).

EUROPE 10.5 MILLION

THE AMERICAS 9.4 MILLION

AFRICA 4.0 MILLION

ASIA 22.9 MILLION

This map shows the estimated number of people living with dementia in each world region in 2015.

We must now involve more countries and regions in the global action on dementia.

World Alzheimer Report 2015, ADI.

Estimated number of people with dementia (2015, 2030 and 2050) and proportionate increases (2015-2030 and 2015-2050) according to wealth (GNP)

Region	People with dementia (millions) (% of world total)			Proportionate increase (%)	
	2015	2030	2050	2015-2030	2015-2050
G7*	12.88 (28)	18.43 (25)	26.28 (20)	43	104
G20**	37.47 (80)	58.99 (79)	99.14 (75)	57	165
G20 excluding G7	24.59 (53)	40.56 (54)	72.86 (55)	65	196
Rest of the world (excluding G20)	9.31 (20)	15.70 (21)	32.31 (25)	69	247
World	46.78 (100)	74.69 (100)	131.45 (100)	60	181

* G7 countries: Canada, France, Germany, United Kingdom, Italy, Japan, and the United States

** G20 countries: Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Kingdom, the United States and the remaining EU member countries (Cyprus, Austria, Belgium, Croatia, Czech Republic, Denmark, Finland, Greece, Ireland, Luxembourg, Malta, Netherlands, Portugal, Slovenia, Spain, Sweden, Poland, Romania, Slovak Republic, Bulgaria, Estonia, Hungary, Latvia, Lithuania)

World Alzheimer Report 2015, ADI.pp60

Costs of dementia in 2010 and 2015 (billion US$, and percent of worldwide costs), by Global Burden of Disease world region classification

Year for cost estimates (basis for prevalence estimates)	2010 (WAR 2000)		2015 (WAR 2015)		2010-2015
	US$ (billions)	Per cent	US$ (billions)	Per cent	Per cent change
Australasia	10.1	1.7%	14.1	1.7%	39.6%
Asia Pacific High Income	82.1	13.6%	109.9	13.4%	33.9%
Oceania	0.1	0.0%	0.2	0.0%	59.0%
Asia Central	0.9	0.2%	1.2	0.1%	28.6%
Asia East	22.4	3.7%	42.9	5.2%	91.7%
Asia South	4.0	0.7%	4.5	0.5%	11.8%
Asia Southeast	4.0	0.7%	7.3	0.9%	81.9%
Europe Central	14.2	2.3%	15.0	1.8%	5.7%
Europe Eastern	14.3	2.4%	23.5	2.9%	64.3%
Europe Western	210.1	34.8%	262.6	32.1%	25.0%
North America High Income	213.0	35.3%	268.9	32.9%	26.3%
Caribbean	3.0	0.5%	3.5	0.4%	18.2%
Latin America Andean	0.9	0.2%	1.1	0.1%	27.0%
Latin America Central	6.6	1.1%	15.9	1.9%	140.8%
Latin America Southern	5.1	0.8%	10.1	1.2%	98.7%
Latin America Tropical	7.3	1.2%	15.6	1.9%	113.8%
North Africa / Middle East	4.5	0.7%	16.7	2.0%	270.7%
Sub-Saharan Africa Central	0.1	0.0%	0.3	0.0%	198.6%
Sub-Saharan Africa East	0.4	0.1%	1.5	0.2%	267.4%
Sub-Saharan Africa Southern	0.7	0.1%	2.3	0.3%	221.7%
Sub-Saharan Africa West	0.2	0.0%	0.8	0.1%	298.6%
Total	604.0	100.0%	817.9	100.0%	35.4%

World Alzheimer Report 2015, ADI.pp61

The global prevalence of dementia among people aged 65 years and above is about 7%, with an increase rate in more developed countries due to a longer lifespan. (1) Under the International Journal of Alzheimer's Disease, it is documented that there is an estimated of "35.6 million people living with dementia worldwide – a number that is projected to increase to 65.7 million by 2030 and 115.4 million by 2050". (2) In addition, approximately 3/4 46.8million[4] dementia patients have not received proper diagnosis. In high income countries, only 20-50% of dementia cases are recognized and documented in primary care. This 'treatment gap' is certainly much greater in low- and middle-income countries, with one study in India suggesting 90% remain undiagnosed. If these statistics are extrapolated to other countries worldwide, it suggests that approximately three quarters of people with dementia have not received a diagnosis, and

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[4]https://www.alz.co.uk/research/statistics

therefore do not have access to treatment, care and organized support that getting a formal diagnosis can provide.

World Alzheimer Report 2019, ADI. pp9

Figure 3. Social life and family relationships. Themes based on textual responses of people living with dementia when asked 'Have you been treated unfairly in your social life? (for example, being excluded from socialising, hobbies, attending events, leisure activities)'
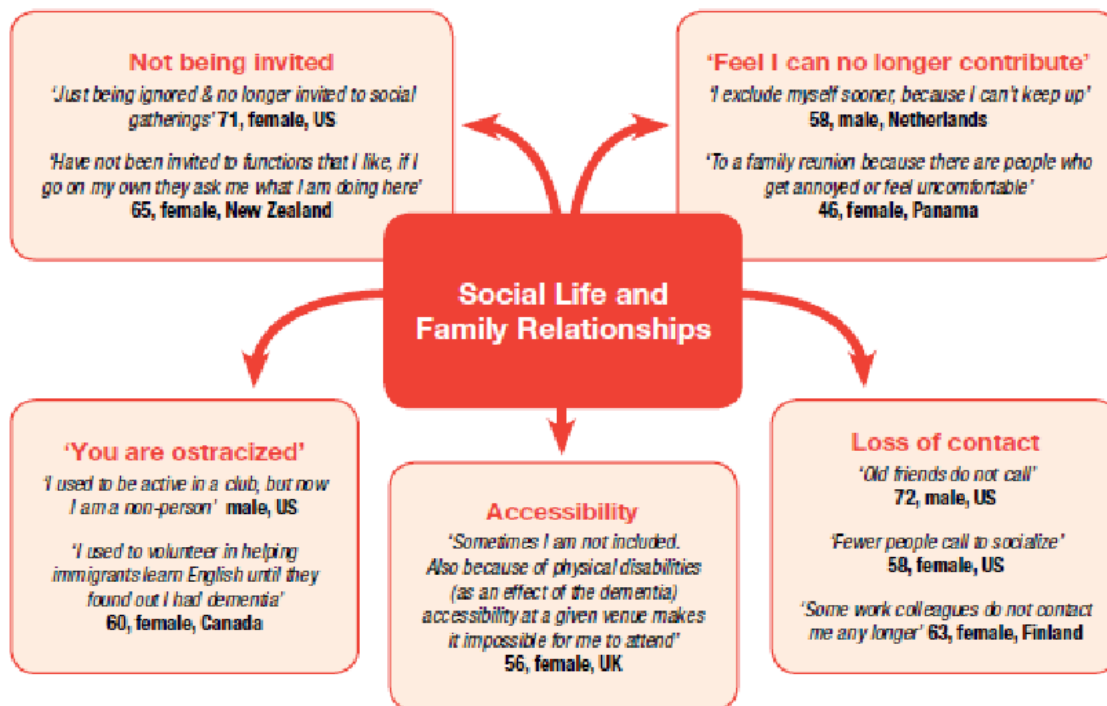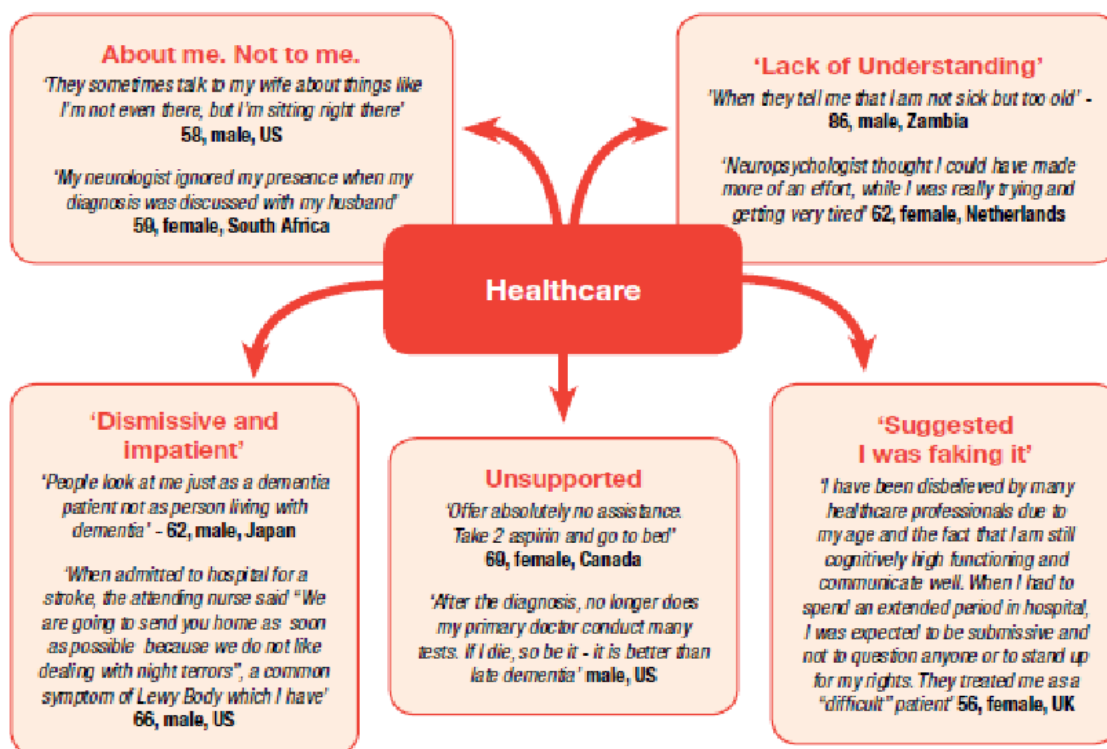
Not being invited
'Just being ignored & no longer invited to social gatherings' 71, female, US

'Have not been invited to functions that I like, if I go on my own they ask me what I am doing here' 65, female, New Zealand

'Feel I can no longer contribute'
'I exclude myself sooner, because I can't keep up' 58, male, Netherlands

'To a family reunion because there are people who get annoyed or feel uncomfortable' 46, female, Panama

Social Life and Family Relationships

'You are ostracized'
'I used to be active in a club, but now I am a non-person' male, US

'I used to volunteer in helping immigrants learn English until they found out I had dementia' 60, female, Canada

Accessibility
'Sometimes I am not included. Also because of physical disabilities (as an effect of the dementia) accessibility at a given venue makes it impossible for me to attend' 56, female, UK

Loss of contact
'Old friends do not call' 72, male, US

'Fewer people call to socialize' 58, female, US

'Some work colleagues do not contact me any longer' 63, female, Finland

Figure 4. Unfair treatment within healthcare. Themes based on textual responses of people living with dementia when asked 'Have you been treated unfairly health or medical staff? (for example, did a health care professional suggest that you disengage from daily activities or social situation)'

About me. Not to me.
'They sometimes talk to my wife about things like I'm not even there, but I'm sitting right there' 58, male, US

'My neurologist ignored my presence when my diagnosis was discussed with my husband' 59, female, South Africa

'Lack of Understanding'
'When they tell me that I am not sick but too old' - 86, male, Zambia

'Neuropsychologist thought I could have made more of an effort, while I was really trying and getting very tired' 62, female, Netherlands

Healthcare

'Dismissive and impatient'
'People look at me just as a dementia patient not as person living with dementia' - 62, male, Japan

'When admitted to hospital for a stroke, the attending nurse said "We are going to send you home as soon as possible because we do not like dealing with night terrors", a common symptom of Lewy Body which I have' 66, male, US

Unsupported
'Offer absolutely no assistance. Take 2 aspirin and go to bed' 69, female, Canada

'After the diagnosis, no longer does my primary doctor conduct many tests. If I die, so be it - it is better than late dementia' male, US

'Suggested I was faking it'
'I have been disbelieved by many healthcare professionals due to my age and the fact that I am still cognitively high functioning and communicate well. When I had to spend an extended period in hospital, I was expected to be submissive and not to question anyone or to stand up for my rights. They treated me as a "difficult" patient' 56, female, UK

Figure 17. Agreement among the general public that 'I would take a genetic profiling test to learn whether I am at risk of developing dementia', by country (% agree)

Country	% agree
Argentina	93.6
Australia	80.7
Belgium	76
Brazil	89.5
Canada	68.4
Chile	93.5
China	83.6
Colombia	84.6
Costa Rica	81.3
Croatia	58.8
Dominican Republic	81.3
El Salvador	80.6
France	72.5
Germany	49.1
Greece	83.3
Iceland	28.6
India	85.9
Indonesia	88.3
Iran	100
Ireland	53.9
Italy	84.2
Japan	79.9
Kenya	69.4
Lebanon	78.3
Macau SAR	84.4
Malaysia	96.6
Mauritius	83.3
Mexico	95.1
Netherlands	59.1
New Zealand	76.1
Norway	43.2
Philippines	100
Poland	81
Portugal	87.2
Puerto Rico	89.6
Qatar	88.3
Romania	64
Russia	70.1
Singapore	93.2
Slovenia	59.6
South Africa	81.8
Spain	92.6
Switzerland	42.4
Chinese Taipei	89.9
Thailand	81.8
United Kingdom	73.9
United States	87.2
Vietnam	95.3
Overall	81.8

World Alzheimer Report 2019,ADI.pp53

According to Cations et al. studies on general public understanding about preventive and treatment of dementia, the results as shown in Figure 1, there is a high percentage of misconception of dementia related to aging and is not preventable, with genetic as the third general factor contributing to dementia.(3)The generated data from this article studied different regions from Europe, North America, Asia and Australia. Despite the perceptive that dementia is usually a terminal disease which is unavoidable and there is no available cure, the group believe that there is an increasing in effective treatment over time (Figure 2). Cognitive training could be one of the effective treatments in prevention and delay dementia.
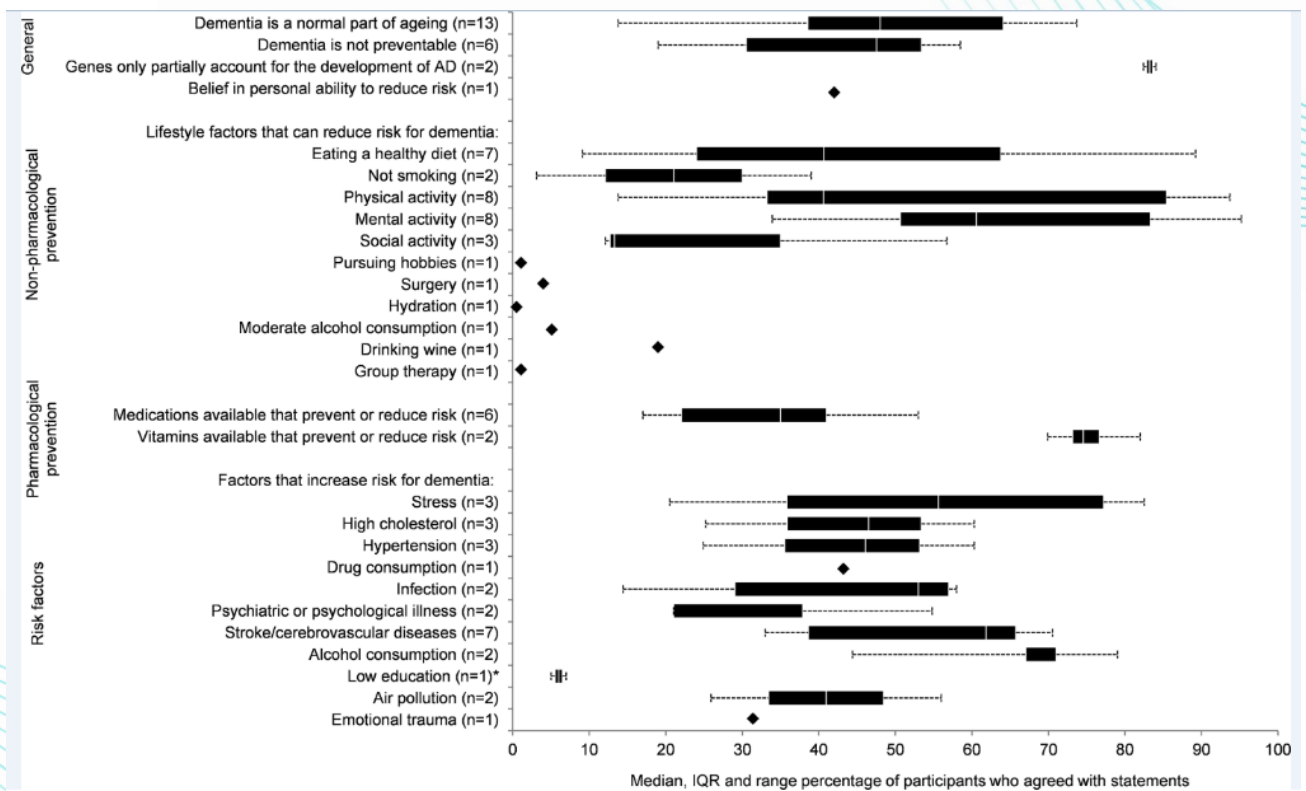

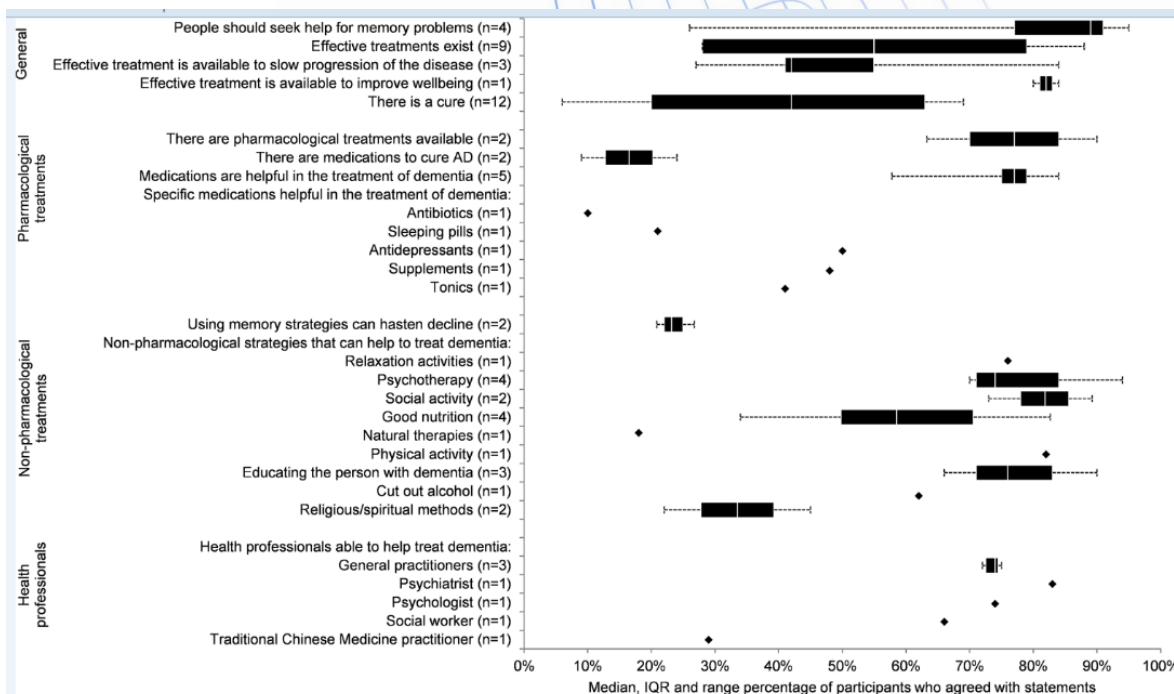*Figure 1 Synthesis of public knowledge and beliefs about prevention of dementia.*
https://doi.org/10.1371/journal.pone.0196085.g001(3)

Figure 2 Synthesis of public knowledge and beliefs about treatments for dementia.
https://doi.org/10.1371/journal.pone.0196085.g002(3)

Memory training has become a pervasive and widely accepted concept as its importance is better understood across the world some decades ago. According to a research by the University of Cambridge, the patients who had played the memory game made significantly fewer errors and needed significantly fewer attempts to remember the location of different patterns in the Cambridge Neuropsychological Test Automated Battery (CANTAB) PAL test relative to the control group. In addition, patients in the cognitive training group saw an increase in their score on the Global Assessment of Functioning (GAF) scale.[5]

Participants in the cognitive training group indicated that they enjoyed the game and were motivated to continue playing across the eight hours of cognitive training. In fact, the researchers found that those who were most motivated also performed best at the game. In another article by Talboom et al., people of aged 60 to 85 years, show tremendous improvement in multi-tasking by practicing a video game activity for a month. In addition to that, participants outperformed 20-year-olds, with just a short period of six months continuous of cognitive training. (4) This article also emphasizes that, "with 21-23 years of education maintained cognitive performance as they aged", and therefore, "better cognitive ability as a child, measured on a global scale of cognitive functioning, was associated with a decreased risk of developing late-onset dementia". In brief, it is proven that mind app is able to benefit the user cognitively and advisable to start at a young age to slow down the process of dementia related disease.

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[5]https://www.sciencedaily.com/releases/2015/08/150802204415.htm

"Cognitive Assessment and Training Market - Global Forecast to 2021"

It is forecasted the cognitive assessment and training market size will grow from USD 3.5 Billion in 2020 to USD 11.4 Billion by 2026, at a Compound Annual Growth Rate (CAGR) of 26.6%.

Major factors contributing to the growth of the market include aging global population, increasing awareness for brain fitness, and advancements in technology. These factors are expected to drive the adoption rate of cognitive assessment and training in the coming years.

The cognitive assessment and training market is segmented by assessment type, component, application, vertical, and region. The components segment is further classified into solutions and services. The various solutions are categorized into assessment, data management, project management, data analysis & reporting, and others (rater training, concussion management, and prescreening solution). These solutions are used to monitor changes in the cognitive function, following the treatment with drugs or other types of interventions. The services segment includes training & support and consulting.

Training and support services are expected to grow at the highest CAGR during the forecast period. Cognitive assessment and training solution and service providers offer training and coaching services to deliver balanced cognitive rehabilitation solutions. The coaching and training segment comprises spreading awareness as well as educating the community and professionals about challenges related to brain and mental health.

The applications segment includes clinical trials, classroom learning, brain training, corporate learning, and research (including patient recruitment and patient engagement). The clinical trials application is expected to grow at the highest CAGR during the forecast period. Cognitive assessment solutions are extensively used to improve clinical Research and Development (R&D).

Market Dynamics

Drivers

- Aging Global Population
- Increasing Awareness for Brain Fitness
- Advancement in Technology

Restraints

- Time Constraint in Developing Clinically Validated Brain Fitness Software
- Negative Publicity in the Media About Brain Training Efficiency
- Stringent Government Regulations Across the Globe

Opportunities

- Increasing Use of Advanced Cognitive Assessment and Training Tools
- Rise in Demand for Improved Brain Fitness

Challenges

- Appropriateness of the Cognitive Assessment Process
- Brain Fitness Education to the Population

Market Players

- Bracket
- Brain Resource Ltd.
- CRF Health
- Cambridge Cognition Ltd
- Cognifit
- Cogstate Ltd.
- ERT Clinical
- Medavante Inc.
- Neurocog Trials Inc
- Pearson Education
- Prophase, LLC
- Quest Diagnostics

http://www.researchandmarkets.com/research/6w4xn3/cognitive

Apart from that, most apps are of subscription model, where credits are purchased and kept until it is used up, and the unused credits are not retrievable. AppDe purchasing model is of pay-per-play mode, where token is paid-per-play and can be gained back upon victory in games. Apart from merely purchasing, using, and gaining back tokens, token can be sold and transacted using AppDe store app.

With the advancement in technology and increased competition among humans –to improve their capacity to store vast amount of information, to enable a long-term memory, and maximize learning capacity-- it creates a wide opportunity to be harnessed by the training centers and platforms across the world. More so, memory training programs are proven effective means to improve intelligence and to enhance cognitive functioning in typically developing children and healthy adults which serves as an indispensable strength to the market. The market has obvious needs especially students are in need to increase the memory power to memorize textbooks; however, the training apps and techniques are not accessible to the students.

OPPORTUNITIES, MARKET SIZE, GROWTH, AND CAGR

It is a safe bet that the market will keep growing giving the size and the scale of the market. It is worth some $40 billion a year, according to the FDA[6].

The development of cognitive and brain fitness solution i.e. memory training are rapidly growing around the world and across all aging segments. Interestingly, the size of the market crossed $1 billion for the first time this year making it a Billion Dollar Opportunity.

According to Research and Market estimate, the global memory training market size will grow from $1.98 billion in 2016 to $8.06 billion by 2021 at a Compound Annual Growth Rate (CAGR) OF 32.3%. More so, a report published by Market watch, estimates the market will reach $9.48 billion by the end of 2022[7].

Technavio, a global leading US market research company, also reported the need for global cognitive assessment and training is expected to raise to USD 13.56 billion during the period of 2020 to 2024. (5)

In comparison, the global higher education industry is expected to reach USD 96.73 Billion by 2024 from USD 51.83 Billion in 2016 at a CAGR of 8.11%.[8]

Figure 3 Cognitive assessment and training, by region, 2021 (USD million). Reprinted from "
Cognitive Assessment and Training Market by Assessment Type (Pen- and Paper-Based, Hosted, Biometrics),
Component, Application (Clinical Trial, Screening & Diagnostics, Brain Training, Academic Research), Vertical, and
Region - Global Forecast to 2021" [7]

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[6]www.fda.gov(The Federal Agency of the U.S. health and human services, Food and Drug Administration)
[7]https://www.marketsandmarkets.com/Market-Reports/memory-assessment-market-1039.html
[8]https://www.maximizemarketresearch.com/market-report/global-higher-education-market/7167/

The rise in the adoption of advanced technologies to help the market grow. The adaptation to the rapid changes in higher education requires the tracking and understanding of the domestic and international shifts in needs. Many of the developed countries in the world, such as the US, the UK, and Japan, are early adopters of advanced technologies.

North America and Western Europe are expected to be the next key sources of demand for cognitive assessment and training market, where North America will dominate due to the rapid transformation and advancement in communication technologies in the U.S. and Canada. This in "turn fuel the growth of the cognitive assessment and training market in North America". Whereas in China, the healthcare industry is moving forward quickly. The rest of the countries including South East Asia and other part of the Asia-Pacific regions, are also moving fast in digital technologies, are expected to be the next target markets to drive and promote training market in the region. According to the Future Market Insights (FMI) analysis, depending on the cognitive assessment and training solutions, it foresees an increase in revenue and demand in this market. (6)

The emergence of new institutes has helped increase the importance of higher education. Globally, the higher education sector is growing at a fast pace and numerous higher educational institutes are being established to fulfil the goal of higher education.

The rise in the cost of higher education is starting to turn off potential consumers such as students. The cost of higher education is very high in private colleges as compared to government institutes.

In relation to that, private tuition market is hugely needed. In 2016, it was estimated that the private tutoring market would surpass US$227 billion by 2022. Another estimate predicted a 7% annual growth in 2016-2020. Online tutoring has become big business due to the potential for individualized support and consumer choice in a competitive global marketplace including brain and memory training. According to Global Industry Analysts, Inc. (GIA), India is leading the way in online tutoring by offering professional linguistic and academic coaching capabilities at an affordable cost[14]. In many countries, private tutoring is no longer viewed as supplemental but as the expected norm and the only way children can compete for positions in higher education. This leads to the reason that private tuition market has become AppDe's main market for cognitive training. In Cations et al. report, "cognitive leisure activities in particular appear to be well understood as good candidates for dementia prevention or delay, consistent with some evidence that they can delay the onset of dementia." (3)

With the presence of a considerable number of companies, this market appears to be fragmented. This market research report will help clients identify new growth opportunities. Several companies are focusing on offering virtual assistants to students, which interacts with people and personalizes the interaction by relying on the information on the relationship between the human user and the virtual assistant[9].

Furthermore, based on the statistics provided by Alzheimer's Disease International, approximately 44.4 million people are suffering from dementia worldwide, as of 2013; dementia

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[9]https://www.prnewswire.com/news-releases/global-higher-education-market-2019-2023-to-expand-at-a-cagr-of-more-than-12-300762471.html

is expected to remain as one of the major neurological diseases globally. To tackle this situation, developments of various memory training are expected to increase significantly.

The total estimated worldwide cost of dementia is US$818 billion in 2015, which represents 1.09% of global GDP. By 2018, the global cost of dementia will rise above one trillion USD. This figure includes costs attributed to informal care (unpaid care provided by family and others), direct costs of social care (provided by community care professionals, and in residential home settings) and the direct costs of medical care (the costs of treating dementia and other conditions in primary and secondary care).

This means that if global dementia care were a country, it would be the 18th largest economy in the world. The annual costs exceed the market values of companies such as Apple (US $2.9 trillion) and Google (US $2.4 trillion).

Market Trends

The following are the trends in the market for dementia and memory training markets:

- Global memory assessment & training market is projected to reach $9.48 billion by the end of 2022. Growth is expected to be driven by several factors including rising adoption of memory assessment & training tools across various sectors, such as healthcare, corporate and education; increasing technological advancements; growing awareness about brain fitness; coupled with rising aging population and increasing life expectancy across the globe[10].
- Moreover, growing provision of brain fitness exercises through hosted services and increasing adoption of gamification (Gamification can be useful for early prediction of delirium, postoperative hospital wards, and evaluation of recovery from stroke) for conducting memory assessments are anticipated to boost demand for memory assessment & training tools during the forecast period, globally.
- The aging of the population is a determinant factor in the growth of the industry. The current growth of the population ages 65 and older is one of the most significant demographic trends in the history of the United States. People in this age group is estimated to double from 46 million in 2014 to 98 million by 2060 in the United States[11], meaning that nearly one in four U.S. residents is estimated to be over 65 years old by 2060. As this population ages, the need to maintain brain health and manage declining memory function will have far-reaching impact both socially and economically.
- Increasing adoption of memory assessment & training tools across education sector for assessing and evaluating skills, abilities, and impairments of a student; and healthcare sector for evaluating psychological and behavioral aspects of the patients; is expected to boost demand for memory assessment & training solutions, globally, during the forecast

[10]https://www.marketsandmarkets.com/Market-Reports/memory-assessment-market-1039.html
[11]https://www.census.gov/newsroom/facts-for-features/2016/cb16-ff08.html

period. Moreover, growing cases of memory impairment, increasing need to improve employee productivity and rising brain fitness awareness programs are some of the factors anticipated to boost global memory assessment & training market over the next five years.Apart from the elderly, children at young age may suffer from low working memory too. Children with low memory may have difficulty in digesting and following multi-step instructions, to perform common classroom activities. Early detection may help children to conquer common cognitive and learning difficulties, which will find beneficial at a later stage of their life. According to Klingberg et al. (**2005**), "Working memory can substantially boost performance on non-trained working memory tasks". (7)

Regional Market Performance

Research shows that most people currently living with dementia have not received a formal diagnosis. In high income countries, only 20-50% of dementia cases are recognized and documented in primary care. This 'treatment gap' is certainly much greater in low- and middle-income countries, with one study in India suggesting 90% remain undiagnosed. If these statistics are extrapolated to other countries worldwide, it suggests that approximately three quarters of people with dementia have not received a diagnosis, and therefore do not have access to treatment, care and organized support that getting a formal diagnosis can provide. These statistics contributes to the growth of the dementia market, for AppDe to reach the market and benefit the users.[12]
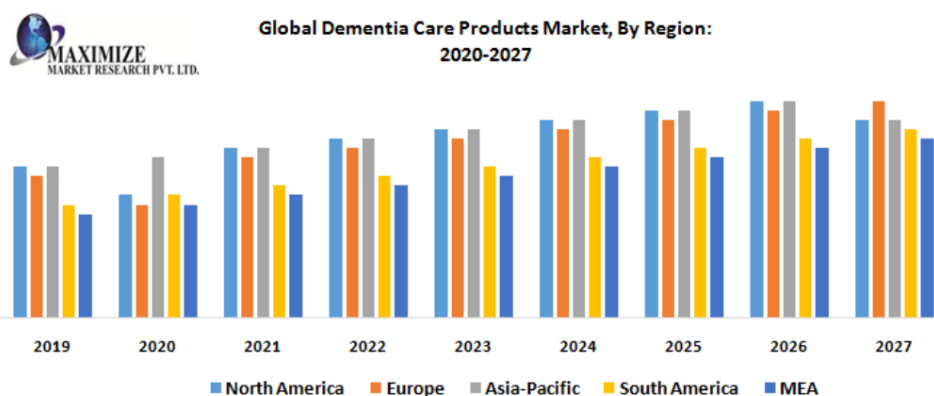

Figure 4 Dementia Care Products Market, By Region: 2020-2027. Reprinted from "Global Dementia Care Products Market – Industry Analysis and Forecast (2020-2027) –By Product Type, End-User and Region." (8)

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[12]https://www.alz.co.uk/research/world-report-2011

As shown above, there is an increasing demands of dementia care products globally every year. The article also reported that Asia Pacific has become one of "the fastest growing region, because of rising incidence rates of dementia patients in this region and growing awareness for these utility products". However, there is also "limitation of product accessibility and affordability in various remote areas"." (8) This concludes that even with the widely availability of the dementia care products, it may not reach out to those in secluded regions. With AppDe it could possibly and hopefully draw these two gaps nearer, providing both treatment and preventive measures, reaching out to those in needs. The introduction of AppDe would like to ensure that the needs of the specific and minority groups are also considered and taken care of.

The World Alzheimer Report 2011 shows that earlier diagnosis and early intervention are important mechanisms by which the treatment gap can be closed. Hence, it can be an important point for AppDe to expand the market to those who have no access to dementia treatment.

SINGAPORE — Once regarded as a condition affecting mostly those aged over 65, a growing number of younger patients have been diagnosed with dementia in recent years.

Last year, the National Neuroscience Institute (NNI) Neuroscience Clinic (Tan Tock Seng Hospital Campus) saw 179 patients aged 65 and below for young-onset dementia, approximately a fivefold increase from 2011.

Singapore has one of the fastest-ageing populations in the Asia-Pacific region, and the number of people living with dementia is expected to double by 2030. The term young-onset dementia is used to describe dementia that occurs in patients aged 65 and below. The most common form is Alzheimer's disease, and some of the youngest patients diagnosed with it are in their 40s, said Dr Adeline Ng, a consultant at NNI's Department of Neurology.

"Due to the younger onset age of the disease, many patients may still be in employment and may have young families. They are therefore likely to face significant social challenges and lifestyle changes brought on by high economic burdens," she added.

According to the Straits Times reported on May 2016, "Dementia and its accompanying woes cost the country $1.4 billion every year", this figure is expected to increase with the alarming increasing number of newly dementia diagnosed cases each year. Researchers also found out that for every single dementia patient, the family and society paid an additional of 5-digit figures in healthcare and social care. (9)

Mrs Jenny Lau (not her real name), 60, has young-onset dementia. Diagnosed with Alzheimer's at 55, the former senior management executive can no longer articulate her needs or perform simple tasks. She started displaying memory loss years before the diagnosis and was referred to the NNI by a doctor treating her for diabetes.

The rising trend in young-onset dementia cases here is similar to some Western countries such as the United States and United Kingdom and is likely due to an increased awareness and diagnosis of the condition, said Dr Ng.

In addition, cognitive impairment may now be detected earlier and more effectively with better screening methods. For instance, a new screening tool developed by the NNI, known as the Visual

Cognitive Assessment Tool, allows doctors to use visual images that transcend cultural, language and education barriers to detect the early signs of dementia.

The rising incidence of lifestyle diseases may also be driving numbers up. About one in nine adults here has diabetes and about one in five has hypertension, according to the 2010 National Health Survey.

While genes may play a part, some chronic diseases are linked to a type of dementia known as vascular dementia, said Dr Charles Siow, a neurologist at Mount Elizabeth Novena Hospital.

The second most common cause of young-onset dementia, vascular dementia can develop due to small, "silent" strokes that develop over time because of risk factors such as diabetes, high blood pressure and high cholesterol, said Dr Ng.

A new study by Bournemouth University in the UK suggests that modern environmental factors could also contribute to young-onset dementia.

In the study, published in Surgical Neurology International in 2015, researchers looked at 21 Western countries between 1989 and 2010, and found that dementia was affecting adults a decade earlier than it used to. They identified issues such as the increasing use of petrochemicals in air transport and motor vehicles, insecticides, and the rise of background electromagnetic fields as potential risk factors.

When dementia affects a younger adult, the symptoms may not always be similar to those in elderly patients. For example, younger patients with Alzheimer's disease and frontotemporal dementia tend to exhibit fewer memory problems, which are predominantly seen in the elderly, said Dr Ng.

The latter condition is the third most common cause of dementia in younger patients, affecting mainly behaviour and personality.

"Younger patients may have more problems with language, problem-solving or planning, or recognising faces, objects and places. They may also exhibit more behavioural problems," said Dr Ng.

According to her, certain forms of dementia like Alzheimer's disease also progress faster in younger patients than elderly patients, and they tend to experience a more rapid cognitive decline as well as earlier and more severe behavioural changes.

Once a quick-thinking senior management executive, Mrs Lau can no longer call her two sons by their names or recognise her friends. Even her husband of 30 years, a 62-year-old freelance consultant, cannot tell for sure if she remembers his name.

Young-onset dementia has affected the parts of Mrs Lau's brain governing memory, cognitive abilities, speech, judgment, reasoning, and sense of restraint.

"At work, she used to manage a department on her own. Now she does not know her ABCs and 123s, can't tell left from right, or even play a simple game of picture bingo," Mr Lau said.

Over the last five years, he learnt to care for her through trial and error. "She once helped herself to a bottle of supplements and consumed 20 to 30 tablets by the time I discovered it," he said. "We rushed her to the emergency department. Another time, she drank mouthwash, not understanding that she should gargle and spit it out. I learnt many lessons along the way before finally realising she has to be eyeballed 24/7, even at night."

Adding to caregiving challenges is the lack of public awareness about the disease in younger adults. After her diagnosis in November 2012, Mrs Lau's behaviour changed drastically. By 2014, she would sometimes stare at or scold people around her, which almost landed her in public fights.

"Despite my profuse and sincere apologies and explanations, some people will not excuse her behaviour. If she was older, people may be more understanding, but many do not know that the condition can occur in younger adults too, so the allowance is not there," said Mr Lau.

There is currently no cure for the condition. An early diagnosis and treatment may slow down the symptoms but will not halt the progression of the disease, said Dr Ng. Once a diagnosis is made, the patient may reach a state where he or she can no longer function independently within a decade, said Dr Siow.

There are cognitive enhancement programmes for young-onset dementia patients that provide mental and physical stimulation, such as the NNI-Alzheimer's Disease Association Esteem programme and NNI Cognitive Assessment and Rehabilitation Programme.

Mr Lau still hopes for a miracle. "Ironically, even though my wife is now with me day and night, I miss her tremendously. The hardest part for me in this journey is the loneliness. I can no longer share my sadness and happiness with her, and no one else, not even my children, can fill this void," he said.

https://www.todayonline.com/singapore/dementia-affecting-more-people-under-age-65

Approximately, 60% of the worlds' population lives in the Asian Pacific region—a home to many different ethnic groups. This issue of the International Journal of Alzheimer's Disease is dedicated to dementia in the Asian and Pacific region and discusses from an Asian-Pacific perspective common themes often noted in the literature from Europe and North America. Themes discussed in this special issue include (1) the prevalence and incidence rates of dementia in Asian countries, (2) the role of biological and genetic risk factors to the development of dementia, (3) characterization of dementia in culturally diverse populations, and (4) activities of daily living functioning and its relation to cognitive functioning.

***In Japan, the supermarket task is included as part of the Japanese version Rapid Dementia Screening Test for early detection of dementia, where subjects have a minute to verbally list down the items that can be purchased from a convenience store or supermarkets. (10) The supermarket task, an activity of a daily living, could also be one simple memory training exercise, especially for the elderly, such as buying a list of items from the supermarket.

In another article, the prevalence rates and mortality of dementia was examined in elderly persons living in Hong Kong. This study suggests that within 30 years the number of people in Hong Kong aged 60 and older will be more than triple; thus, the increase of prevalence of dementia cases in this region will prove to be substantial. The authors also discuss two other important issues related to care for those with dementia: (1) the impact of a declining "oldest old support ratio" and (2) the burden of dementia as measured by the Disability Adjusted Life Years (DALYs) approach. The authors postulate that by using these two metrics, in addition to data regarding the ongoing trends in the region, a successfully long-term care strategy for dementia of the aging population in Hong Kong can be achieved.

https://www.hindawi.com/journals/ijad/2012/171327/

SWOT ANALYSIS

Strengths:

- Strong management team formed by experienced entrepreneurs.
- First-mover advantage in the market for app stores specializing in memory-related games/applications.
- Unique eco-system created for users and caregivers.
- The company leverages a blue ocean advantage over competition based on its offering in its unique niche/market segment.
- Company is well connected to a global pool of talents to execute the Whitepaper.
- Diversified client base: This will reduce dependency on one market segment.
- Blockchain act as a copyright medium for apps to store games together with information such as a developer, descriptions etc.
- AppDe Multiplayer Game Engine provides free services to new game developers which help in launching their new games through API without much knowledge about blockchain.
- API provides convenience for users by enabling pay-per-play charges of APPDE Coins while playing games, which allows users to have their winnings (coins) transferred to their wallet automatically.
- Unlike conventional apps that uses subscription model or credit system which users are not able to utilize the credits fully.

Weaknesses:

- The company has no marketing infrastructure which has resulted in limited brand equity and limited online presence.
- The company's ability to successfully launch depends on whether it can successfully raise soft cap amount in token sales.

Opportunities:

- High level of interested global audience in the memory training market.
- Large population of dementia patients worldwide
- 75% of dementia patients are seeking medical treatments.
- Opportunity for industrial partnership with memory training influencers, relevant government organizations in mental health, Alzheimer's Associations, and Brilliance Brain Enterprise.
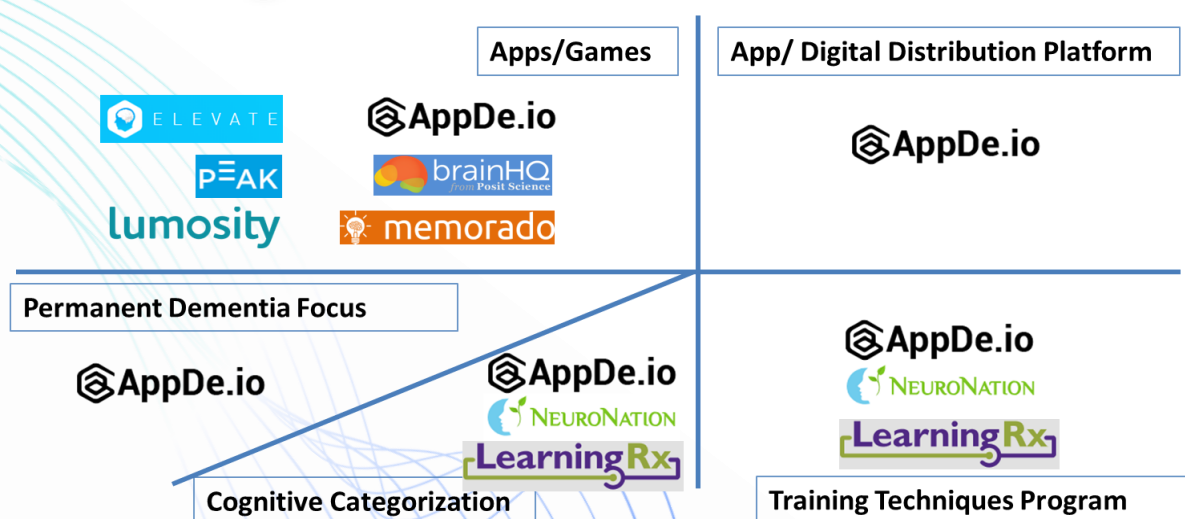
Threats:

- The memory training industry is globally competitive one and there are thousands of memory training apps available online.
- The threat of new entrants is real. Although entry costs remain high, recent entries have taken a strong foothold in the market.
- Lack of sufficient capital may pose threat to business success.

MARKET PLAYERS

1.	**Lumosity**: This is the most well-known cognitive training app, which means it has been fairly well-studied. The results fit the general pattern — subjects perform much better at closely-related tasks, and some of those skills might transfer.

2.	**NeuroNation:** NeuroNation offers personalized Brain Training for the young and old on the web and app in three aspects, namely focus, memory and intelligence. For instance, to help school students train their arithmetic abilities, help school graduates prepare for aptitude tests, prevent job burnout and seniors to stay mentally fit.

3.	**LearningRX**: LearningRx is not a smartphone app, but rather a one-on-one and face-to-face brain training program. This company is proactive in commissioning peer-reviewed studies on their product over 35 years of ongoing research, testing, and development.

4.	**BrainHQ**: This is one of the more scientifically-substantiated programs out there – pieces of evidence in favor of it have emerged in several studies over the past few years. There have been several high-quality studies proving the effect on processing speed, memory, and cognitive benefits in general.

5.	 **Elevate:** Elevate is a new type of cognitive training tool designed to build communication and analytical skills. Elevate has been selected by Apple as the App of the Year. Since launching in May 2014, Elevate has been downloaded more than 15 million times on the App Store and Google Play.

Competition & Advantages

Apps/Games	App/ Digital Distribution Platform
ELEVATE AppDe.io PEAK brainHQ from Posit Science lumosity memorado	AppDe.io
Permanent Dementia Focus	
AppDe.io AppDe.io NEURONATION LearningRx	AppDe.io NEURONATION LearningRx
Cognitive Categorization	Training Techniques Program

The diagram above clearly shows that AppDe dominates the market.

App/digital distribution platform and dementia focus: Being the first and only app/digital distribution platform focusing on dementia allows users to easily access the professionally certified apps for memory training app.

Apps/games: AppDe does not compete but collaborate with the other platforms, allowing the games to be uploaded to AppDe store.

Training Techniques Program/Cognitive Categorization: Same as apps/games, AppDe will collaborate with the other competitors in the cognitive training market.

TARGET MARKET

Target market	Age range
MemoryPlus market	60 and above
MemoryHack™ market	9 to 22

1. MemoryPlus market: People living with memory-related health conditions (such as dementia patients). This category of customers generally struggle with using their memory effectively to carry out simple everyday functions such as remembering names of family members. The target market will be dementia patients aged 60 and above.

2. MemoryHack™ market: These are people who are interested in developing a super memory power to enable them to learn more, retain more information, and forget less. The age range will be from 9 to 22. Customers in this market segment are generally interested in topics such as speed-reading, memory improvement, brain performance, and accelerated learning. Customers in this target market are people whose primary rationale for learning memory performance training is to enable them to use their memory to perform better e.g. memorizing texts, speed reading, cognitive awareness etc.

COMPETITIVE LANDSCAPE

The brain (or memory) training app market is highly competitive as there are thousands of apps competing for a top spot on either Google Playstore or Apple App Store. The market leaders in the traditional brain training app market are CogniFit, Peak, and Lumosity.
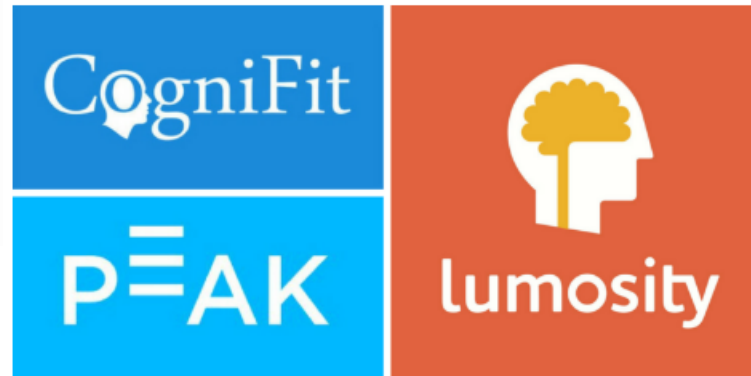
The industry is a big one and is believed to be profitable. Luminosity has an estimated annual revenue of $23.6 million[13], Cognifit have recently secured $9.2 million in investment[14] and Peak have raised $7 million in a recent investment round[15]. The market for cognitive assessment which the brain training market is expected to grow from its 2016 level of $1.98 billion to $8.06 billion in 2021 which is a huge compound growth of 32.3% according to one market research report.[16]

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[13]https://www.forbes.com/companies/lumosity/

[14]https://pitchbook.com/profiles/cognifit-profile-investors-funding-valuation-and-analysis

[15]https://techcrunch.com/2015/04/16/peak-brain-training/

[16]http://www.marketsandmarkets.com/Market-Reports/cognitive-assessment-market-1039.html

[17]https://www.forbes.com/sites/jamesmarshallcrotty/2012/10/30/global-private-tutoring-market-will-surpass-102-billion-by-2018/#2a9b6802ee0c

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https://firelotto.io/marketing_report.pdf

Despite the competitiveness of the market, AppDe Store will leverage a Blue Ocean strategy over its competition by creating a niche app store in uncontested market space that makes competitors irrelevant and creates new consumer value. AppDe Store's competitive edge will therefore lie in its ability to provide a niche and well-regulated platform where effective apps specifically in the memory improvement/training categories are listed, and able to create an eco-system for users and caregivers alike.

Provable Fairness:
https://en.bitcoin.it/wiki/Provable_fairness

Private Tuition Market:
https://unesdoc.unesco.org/ark:/48223/pf0000259338

PRODUCT/SERVICE DESCRIPTION

Overview

AppDe Store (AppDe.io) is blockchain-based app store that specialize in dementia improvement and super brain training apps and training programs. The main offerings of the AppDe Store platform are:

A. MemoryPlus apps: These apps cater to helping patients living with dementia improve their memory capacity. These games project images that naturally inspire movement of touch and trigger a sense of reminiscence to invite and stimulate participation at every level to ensure that no one is excluded or ruled out. Apps in this category are developed and listed on the platform by third-party developers will undergo an approval process by AppDe professionals before they are published on the platform to ensure that only apps that offer significant benefits and rewards to the dementia people are listed.

B. MemoryHack™ apps: MemoryHack™ comprises memory training apps that cater to individuals looking to develop super brains that are capable of advanced memory capabilities. Apps in this category are developed both by the company's in-house developers as well as talented third-party developers. Apps in the category will however not undergo any approval process. In addition to the apps listed on the platform, AppDe Store will also provide premium online training courses that focus on teaching people memorization techniques for developing a super brain.

C. Subscription Service: The subscription service works by connecting both users and caregivers remotely. As some of the users may fall under the vulnerable category, having a direct remote connection and remote control over the use of the app by a trusted caregiver may give both the user and caregiver a certain amount of freedom to go about their own activities. Some of the features include:

- Caregivers Community network
- Face Verification of Caregivers
- Patient Community PLUS access
- Remote viewing access
- Remote Control access
- Remote setting of play time
- Remote switch-off of account
- Performance Tracking and Analysis

D. Power-UP! Avatar: Limited exclusive ERC721 Avatar items will be released over time to encourage users to participate in the games to earn AppDe coins in order to buy these limited Avatar items. The aim of this is to add another encouragement point for users to want to play the AppDe games. A user's existing owned avatar items can be used in app to exchange for newly released avatar by AppDe. The old avatar once exchanged, will be burned to ensure a diminishing supply to constantly increase the exclusivity of the avatar item.

AppDe Ecosystem– How does it work?

AppDe games and application platform designed to cure or prevent dementia while being user friendly and allows easy integration with our tokens, reward mechanism, multiplayer game engine and blockchain without knowing how to code smart contract.

AppDe Store is a platform uniquely structured and designed to allow third-party designers to integrate their ordinary apps with the AppDe API, which acts as a conventional payment gateway similar topaypal, how transactions are done using only APPDE coins. AppDe store app also acts as a mobile wallet facilitated by API, to transfer tokens to other AppDe users only through AppDe store app.
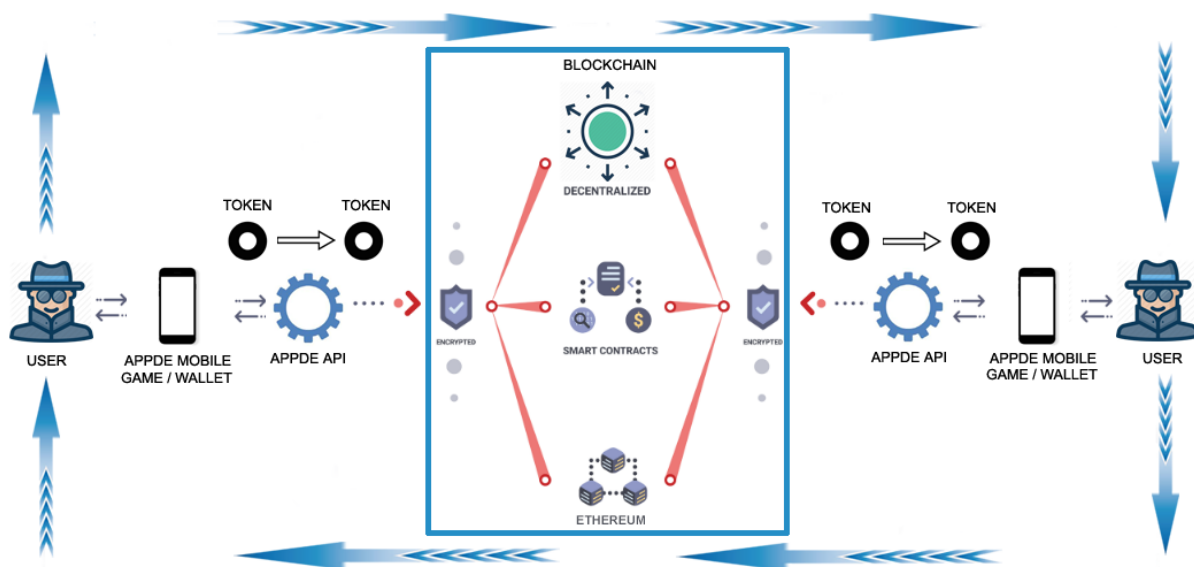
Web designer/ Web master can set up the APPDe payment gateway for free and no additional charges are incurred during transaction except for the Ethereum charges. The setup can be done easily by adding simple code and url into the website which can be done easily by any webmaster together with the Appde API. The AppDe API is applicable to any e-commerce website and can be configured by technical and non-technical users.

This explains why users of the platform are not required to have any pre-existing knowledge of blockchain technology or Ethereum in order to navigate seamlessly.

API also provides convenience for users by enabling real time charges/transactions of APPDe Coins while playing games, which allows users to have their winnings (coins) transferred to their wallet automatically.

Every app available on the platform will be integrated with blockchain smart contract to eligible users earn rewards in form of AppDe Coins (APPDE). This mechanism will involve digital assets

and two or more parties, where some or all of the parties' deposit assets into the smart contract and the assets automatically get redistributed among those parties according to the algorithm of AppDe's API and smart contract.

AppDe leverages the best in breed technology to build a fast, reliable, and scalable ecosystem. Our solution is made up of 4 main components: the core Appde Store platform (AppDe.io), the decentralized API, Multiplayer Game Engine, and AppDe coins (Coin-based rewards smart contracts).

AppDe will revolutionize the way developers integrate apps with blockchain-powered app platforms. Because of AppDe Store's decentralized blockchain solution, it will create a global marketplace that brings together thousands of high-quality apps and games developed by third-party developers who earn tokens based on the performance of their apps.

AppDe Store also supports multi-player game actions. On AppDe, developers are provided with the choice of developing single or multi-player game engines.

The Multiplayer Game engine acts as a core engine to host centralized apps/games for real time multiplayer gamers. Multiplayer Game Engine is expensive and is a common engine used in online games, especially related to multiplayer games. It is costly to subscribe the services of multi playing on these game engines. AppDeMultiplayer Game Engine provides free services to new game developers AppDe Multiplayer Game Engine provide free services to new game developers which helps in launching their new games cost effectively. Charges only applies when the game started to have high consumptions which we believe they are already making profits. The game can be connected to the game engine through Appde API by embedding it to the game. API directly connects to game engine and blockchain without developers having much knowledge about it. AppDe API runs on quick, easy, and simple way to connect.

Workflow of AppDe Store

The workflow of the platform is explained below:

1. The developer builds the app using the AppDe API. The game will interact with multiplayer game server and smart contract through this API.
2. The developer submits the developed app to AppDe store.
3. AppDe evaluates the app for approval based on the documents and game submitted. If approved, the app gets published on the AppDe store.
4. Once an app is published, app users can now download the app and register as an AppDe user.
5. Following the registration and download of the app, users can now play the game.
6. As users access and play the published apps, developers can start earning tokens when users play or use their app.

Benefits of Appde's Blockchain Games and Apps

There are hundreds of benefits using blockchain as the platform for games and application storage (AppDe Store). Below are a few important benefits how AppDe store make use of blockchain values:

- Copyrights-Games and apps uploaded to the AppDe store are automatically stored in the blockchain together with information such as a developer, descriptions etc. Blockchain act as a copyright medium for such apps.

- Tokenomics - Tokenomics does not exist in other types of gaming platforms. Tokenomics create different interest groups in a network, which enables different properties of game/app theory. Using tokens to design incentives or create new assets give immense power to the blockchain games.

- Decentralized-Anyone can analyze the code used in blockchain games. This brings transparency and puts players and creators on the same side. No one has control over

the outcomes of the game. If the developer tries to do an update not supported by the community, the game can be forked, and different versions can be built.

● Reusable Game Assets- Game accessories are unusable and invaluable outside of the game or the marketplace. This is the big problem in conventional games. As blockchain collectibles live on distributed open database represented by tokens (non-fungible tokens), collectible accessories can be reused/ buy and sell outside of the game and there are marketplaces like Rarebits Rare Bits and Opensea, where you can buy and sell these collectibles. These accessories can also be transferred directly(P2P) through blockchain wallets. Cryptokitties is one of the most famous non-fungible tokens (collectible game items).

● Transparency and Incentives-Blockchain are open and verifiable, this really helps in betting games as a player do not want to trust anyone. Also, game rules such as provably fairness algorithm and incentive mechanism are verifiable by anyone which reduce fraudulent activity. If developers can no longer change the rules of the games easily, it becomes more difficult to exploit existing users to make money. This trust component to blockchain games makes will benefit both developers, new users, and loyal players. With blockchain-based games, players and creators are on a team.

● Unstoppable Games-Conventional games run on the centralized server. They can be discontinued for some reason. Decentralized applications/ games running on a blockchain are unstoppable.

● Low Migration Cost- A smart contract can be designed in a way that it lowers the cost if any game rules need to update. As a smart contract can be parameterized and interact with other subcontracts. Data will be stored on the different contract. A different sub-contract address can be passed to change the behaviors and data need not be changed.

PROVABLE FAIRNESS

Provable fairness is a technology facilitated by both cryptocurrency and blockchain technology that makes it impossible for a player or game/app operator to cheat. You no longer have to be suspicious of the house for bets lost. So, whatever game you are playing, you can be confident that the results are fair and accurate, given the probable fairness of our gaming platform. Corresponding concepts provide a way for both operators and players to contribute to randomization, which in turn removes any possibility of deceit or cheating. The foundation of fair gaming algorithms were laid by pseudorandom number generators, utilizing seeds which determine the outcome of wagers. A seed shall be equally influenced by players and hosts, meaning that the result of each bet or game at a provably fair casino is a team effort. The platform is no longer in complete control of randomization.

To prevent malicious behavior, host must not show us their actual seed first. instead, they present a commitment of their own seed to us. Similarly, to envelopes, commitments seal and conceal messages contained by them. They cannot be altered or revealed without the consent from the sender. For example, host may commit a seed by using a one-way hash function or public key cryptography. Hosts shall provide transparency and proof of authenticity by revealing their actual seeds at the end of each game. Anyone in possession of a host's commitment may verify the immutability of the corresponding seed. Bets shall be reproducible once the host seed gets revealed. Players can constantly audit the behavior of hosts by comparing random results calculated by a host and them.

Verifiability of Pseudorandom Outputs

Pseudorandom number generators provide sequence of seemingly random outputs initialized by a seed. The presence of an initialization parameter provides the opportunity to use it as a key for verification results.

- Host Seed: Shall be kept in secret until the end of a particular game. Similar to a private key in asymmetrical cryptography.

- Public Seed: Players should only generate or contribute to it (with equal amounts of influence) after a commitment (eg: cryptographichash) of host seed has been broadcast to every participant of a particular game. Broadcasting a commitment of host seed amongst players not only protects host seed from being revealed early, but serves as a verification of integrity, proving that during a game, host seed could not have been tampered with without notice.

Using a mix of the entire host seed and public seed (eg: by concatenating them) as an initialization parameter for randomization, every participant may have an influence on the outcome of results, with a negligible chance of manipulation in favor of any entity.

In a peer-to-peer network, every player is also a host, resulting in the presence of multiple host seeds and public seeds possibly paired to a private key and a corresponding public key for every participant.

Initialization cycle

A random host seed must be generated to initiate a new game, casino game for instance.

- Whether only a single player is bettering against the casino, a host seed must be generated by the host using a true random number generator.
- If multiple players are betting against the casino, a provable fair seeding event may be used to generate host seed.

A provably fair seeding event makes it possible to generate public seed using a trustless randomization service (i.e the has of a specific upcoming block in the blockchain of a cryptocurrency), disallowing participants to have a direct influence on in-game randomization.

When multiple players participate in a game, host seed shall not be generated by a single entity because that would allow coalition to gain advantage over honest players by whispering host seed early to a selected group of participants. Once host seed is revealed, outputs generated by the algorithm become reproducible, proving that random results could not have been manipulated in favor on an entity.

Properties of a provably fair algorithm

The algorithm behind the game is fair if and only if each participant has the same effect on randomization in the game in a verifiable manner. Participants include players and, if present, trustless seeding services. Given a commitment scheme which is computationally infeasible to break.

Algorithm

Numerous generic fair algorithms will be used for games which are influenced by randomization, including, but not limited to, generation of numbers using secure algorithm.

Generating a random integer in the range

The output generation function should be hard to invert in order to protect outputs from being predictable before host seed is revealed. While any entity in possession of host seed may predict the outputs of a provably fair algorithm, there should be no concern about fairness until every player has the same amount of information about host seed during a game.
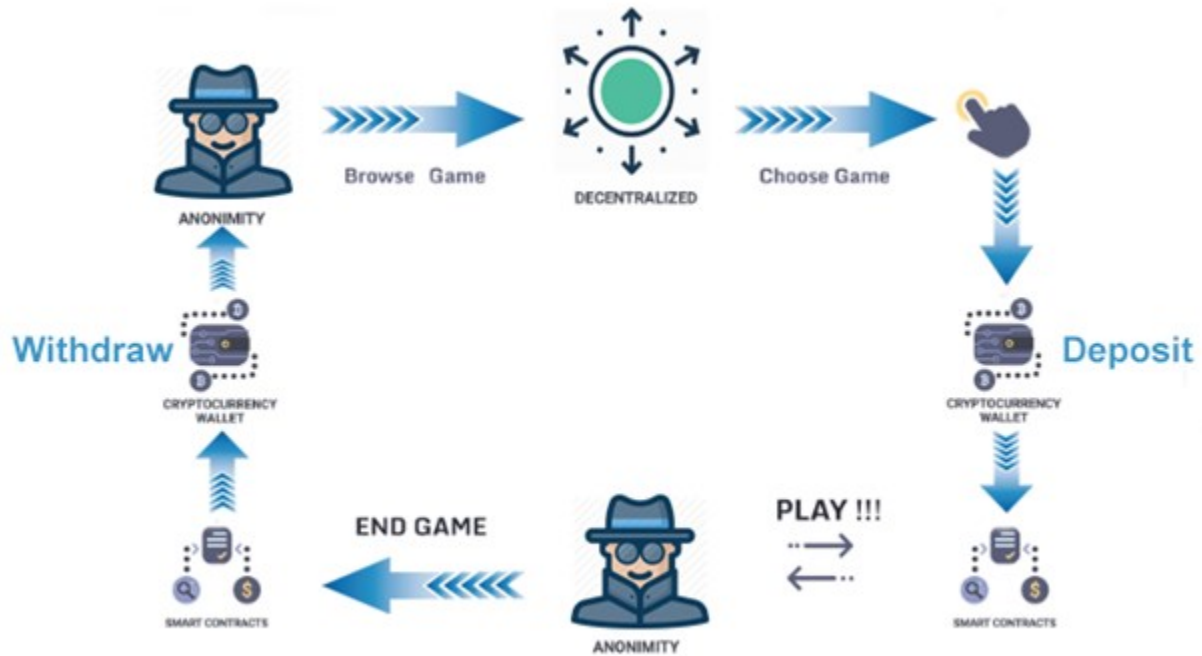
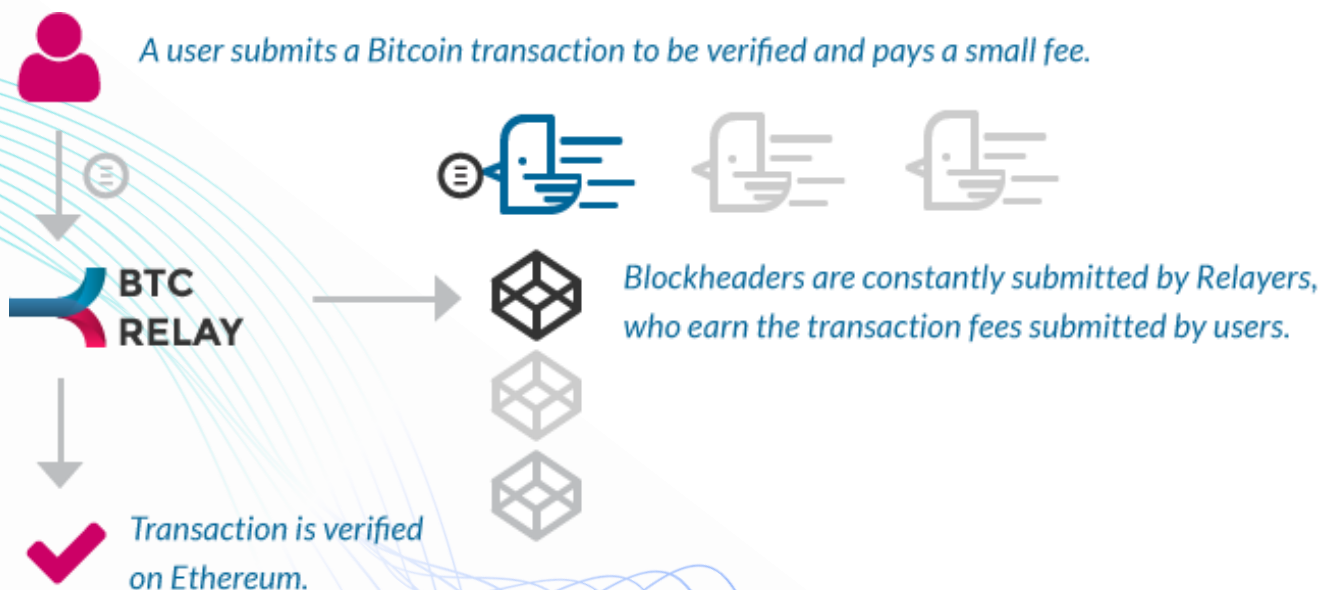# ADVANTAGES OF USING ETHEREUM SMART CONTRACT

Encapsulation, Speed, and Low-Cost Minded Design

One of the most important selling points of smart contract is the improvement of cryptocurrency transaction propagation speed. We know what cryptocurrency users want in terms of transaction speed, using smart contracts will ensure cryptocurrency exchange to Fiat without involving intermediaries. This way transactions can be trajected without incurring any unnecessary delays and costs at any third-party intermediaries like other exchanges do. This will enable our platform to achieve lighting speed transactions.

Smart Contracts Secured Transactions Beat All Hacking Attempts

Using smart contracts ensures a hack proof smart contract secured transaction lane where all the transactions streaming through the platform will flow. This has been made possible by incorporating Ethereum introduced smart contract services into the transaction processing algorithm, Coupled with a user verification system, smart contracts will achieve the next generation of transaction security on the AppDe platform.

Ability to Accept Major Cryptocurrencies

A user submits a Bitcoin transaction to be verified and pays a small fee.

BTC RELAY

Blockheaders are constantly submitted by Relayers, who earn the transaction fees submitted by users.
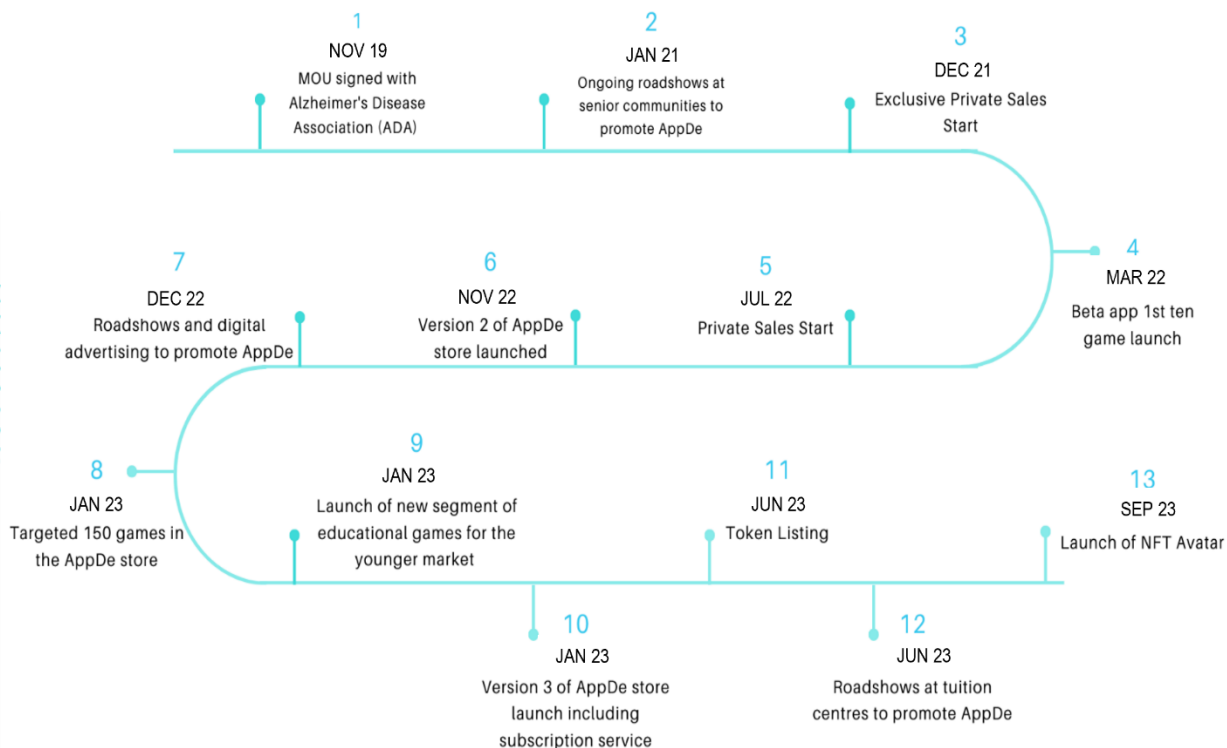
Transaction is verified on Ethereum.

AppDe Coin token is hosted using Ethereum smart contracts. However, our e-wallet is able to accept major crypto currencies like Ether (ETH), Bitcoin (BTC) and LiteCoin (LTC).

Smart Contract Features

- A smart contract is created for each multiplayer game defining the price, entries, amount etc.
- Participants can purchase tokens with ETC, BTC, LTC and deposit directly into a game / app
- Once the minimum number of entries are reached, the game / app is activated.
- The smart contract automatically sends payment to the winner.
- The smart contract will automatically execute payment to the game winner.

ROADMAP

1
NOV 19
MOU signed with Alzheimer's Disease Association (ADA)

2
JAN 21
Ongoing roadshows at senior communities to promote AppDe

3
DEC 21
Exclusive Private Sales Start

4
MAR 22
Beta app 1st ten game launch

5
JUL 22
Private Sales Start

6
NOV 22
Version 2 of AppDe store launched

7
DEC 22
Roadshows and digital advertising to promote AppDe

8
JAN 23
Targeted 150 games in the AppDe store

9
JAN 23
Launch of new segment of educational games for the younger market

10
JAN 23
Version 3 of AppDe store launch including subscription service

11
JUN 23
Token Listing

12
JUN 23
Roadshows at tuition centres to promote AppDe

13
SEP 23
Launch of NFT Avatar

Phrase 1

Phrase 1 will start with the launch of the Appstore with basic functionalities such as curated games. The MemoryPLUS segment will be the focus, where games will be catered towards Dementia Patients. The AppDe team will concurrently be spearheading roadshows at senior communities such as senior homes, senior care centres etc to encourage Appstore usage. AppDe will also tie up with dementia associations and related associations.

Phrase 2

Phrase 2 will see the launch of the basic and premium subscription service. AppDe's unique offering of caregiver controls lets the caregiver control what game the user plays, how long the user can be online, alerts, viewing etc.

Subscription Services - PM

BASIC
$9.90 OR 20 TOKENS

- 1 Caregivers Community PLUS access
- 1 Patient Community PLUS access
- 1 Remote viewing access
- In game pop up messages
- No adverts

PREMIUM
$15.90 OR 32 TOKENS

- 3 Caregivers Community PLUS access
- 1 Patient Community PLUS access
- 3 Remote viewing access
- In game pop up messages
- No adverts
- 1 Remote Control access
- Remote setting of play time
- Remote switch-off of account
- Remote token spend limit

ULTRA PREMIUM
$29.90 OR 60 TOKENS

- 3 Caregivers Community PLUS access
- 1 Patient Community PLUS access
- 5 Remote viewing access
- in game pop up messages
- No adverts
- 3 simultaneous Remote Control access
- Remote setting of play time
- Remote switch-off of account
- 3X in game token earnings
- Avatar of the month
- Performance Tracking and Analysis

Other Features

APPDE Coins	• APPDE coins can be purchased via the app or an external exchange
Avatar	• Game avatar can be purchased using APPDE Coins
APPDE Coin win	• Users that complete more tasks are incentivized with a small amount of APPDE Coin depending on the difficulty of the task
Directed Donations	• APPDE coin donations can be directed to various charity organizations also utilizing AppDE for their patients
Caregivers Community PLUS	• Online community for Caregivers
Community Network	• Online community for Patients

Further, the caregivers and patient Community services will be launched, where caregivers can connect with other caregivers and patients with other patients. As this involves a group of potentially vulnerable users, all users joining the Community must be securely verified.

Phrase 3

AppDe will launch MemoryHack in phrase 3. The target segment for this group will be the younger school going segment (pre-primary to university). Memory training classes will be offered, as with games targeted towards the memory training market.

APPDECOIN is expected to be listed in Phrase 3, and subscribers will have the option of paying for their subscriptions, memory training classes, and in-game purchases via credit card or tokens. NFT avatar will also be launched concurrently.

Here, users will be able to earn a small amount of APPDECOIN every time they play a game. This will incentivize users to play the games with the promise of a reward.

Power-UP! Avatar

Power-UP! avatar using non fungible tokens will be minted. Power UP!s are digital collectibles that can be bought using APPDECOIN. Power-UP!s are created using non-fungible token ERC721 so the Power-UP!s are indivisible and unique. A maximum of 10 million Power-UP!s can be available in the market at any point in time. AppDe will release different tiers of avatar ranking in terms of obtainability difficulty.

Each avatar will have power points tagged to it. Power points each users owned avatar will be totaled up, and a ranking system will rank users according to their power points. Rewards will be given to the top-ranking users at the end of each quarter (season).

New avatar released will have a limited purchase period, after which, unsold avatar will be burned. Up to 10% of each avatar type may be kept by AppDe Technologies.

Tier 2 avatar and above may require the owning and exchanging of Avatar of lower tiers. Avatar exchanged will be burned. This is done to create a diminishing avatar supply to encourage a robust NFT market. There will be a maximum of 10 tiers of avatar of increasing obtainable difficulty.

Tier 1 Avatar

🥾	500,000 boots Cost: 2 APPDECOIN	Boost token earnings by 0.5% 100 power points
🗡	500,000 Sword Cost: 2 APPDECOIN	Boost token earnings by 1% 200 power points
🛡	500,000 Shield Cost: 2 APPDECOIN	Boost token earnings by 1% 200 power points
👼	200,000 Wings Cost: 5 APPDECOIN	Boost token earnings by 3% 400 power points
🧤	300,000 Gloves Cost: 4 APPDECOIN	Boost token earnings by 3% 300 power points
🏵	300,000 Belt Cost: 4 APPDECOIN	Boost token earnings by 3% 300 power point
🧥	200,000 Cloack Cost: Lucky Draw from playing games	Boost token earnings by 3% 400 power points
⛑	100,000 Helmet Cost: Lucky Draw from playing games	Boost token earnings by 3% 500 power points

Tier 2 Avatar

🛼	50,000 Winged boots Cost: 20 APPDECOIN + 2 Boots + 2 Wing	Boost token earnings by 5% 1000 power points
🛡	50,000 Metal armor Cost: 20 APPDECOIN + 1 Shield + 1 Belt + 1 Cloak	Boost token earnings by 5% 1000 power points

Tier 3 Avatar

🛡	10,000 Flying Metal armor Cost: 30 APPDECOIN + 2 Shield + 1 Metal armor + 2 Wings	Boost token earnings by 7% 2000 power points

New avatar will be released periodically according to market conditions. Avatar with increasing difficult attainability will also be released at higher tiers to keep the idea of exclusivity.

Avatar will also be dropped at random to game users to further encourage them to train the brain by using more of AppDe.

MARKETING PLAN

Overview

AppDe Technologies envisions marketing its app store platform and memory training courses throughout Malaysia and across the world. To achieve this goal, the company believes it would be pertinent to develop a strategic marketing plan to help it achieve its marketing and sales goals.

AppDe Technologies overarching marketing strategy for reaching customers with memory-related health conditions such as dementia is through the following ways:

- Working towards getting endorsement or partnership deals with top specialist hospitals, elderly care homes, and related health associations focused on the treatment of dementia.
- Forging a strategic partnership with global nonprofits and government institutions specializing in patients living with dementia.
- Sponsoring local and global health events geared towards raising awareness for dementia.
- Creating social initiatives and charity events that can bring AppDe some positive Press Release or media engagement to the company.
- Leading the company's R&D team to continuously conducting ground-breaking scientific research that could position AppDe as a leading authority in its industry.

On the other hand, the company's MemoryHack offering will be marketed mainly through the following strategies:

- Creating memory contest on social media that can drum up a lot of awareness and support amongst interested audiences.
- Creating an online/social media video marketing campaign that features successful students sharing their testimonials.
- Using known influencers in the memory training industry as brand ambassadors of the company.

Marketing Objectives

Build market trust through sponsorship of events that relate to memory training or dementia awareness.

- To develop and register copyright the training programs.
- To create brand recognition across online/social media channels
- To align the brand with target market expectations.
- To build loyalty amongst customers through positive third-party experience.
- To give free web MemoryPLUS and MemoryHack training programs to encourage app downloads.

Promotion Plan
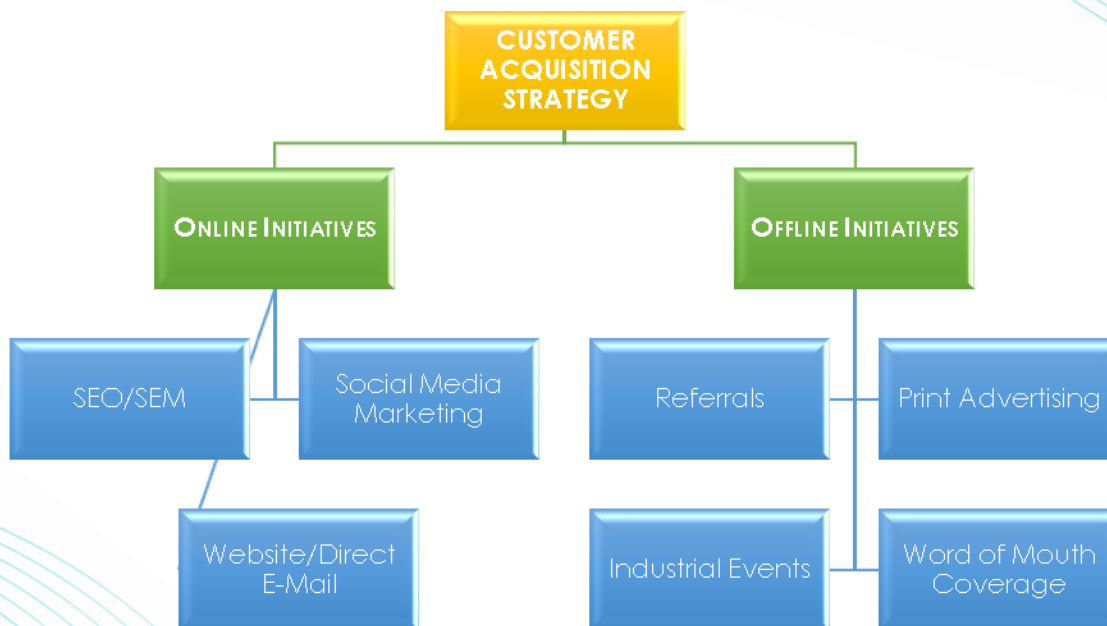
Online Initiatives

Social Media

A solid online presence represents an inexpensive promotional and informational strategy. AppDe shall operate social media platforms such as Twitter, YouTube, Facebook, Instagram etc. The social media will be used as a key tool towards promoting the brand while utilizing the widespread prospects in the social media to spread information about the business activities of the company.

It is expected that engaging the social media would enhance the company's brand exponentially through its easy-to-use interface and referral mechanism. However, the goal of social marketing is not to make sales but to gain followers. The more followers AppDe has; the more people see the company's ads when promotions are run on its social media pages.

Facebook: AppDe shall post relevant contents frequently on its Facebook page including keeping followers updated on important information about the quality of our game/app. In order to achieve effective social marketing campaign, it is advised that the management of AppDe continually launch Facebook campaign ads targeted at attracting demands for potential customers to download its games and app.

Twitter: AppDe shall maximize the marketing potentials embedded on twitter. The company will tweet relevant contents based on its marketing goals/strategy and re-tweet follower's tweets when (e.g. #AppDe is in use. The company will support followers, steer conversation, and create a buzz in the space.

Instagram: Due to the nature of AppDe business activities which lends itself to a lot of image contents, the company believes that Instagram or Pinterest would be highly effective as other social media channels in marketing the complete line of products to consumers.

Snapchat: Snapchat is the third most popular social media platform with over 100 million daily customers. Thus, proves its viability as an effective platform for online marketing campaign. AppDe Store would promote its games/app on snapchat by creating filters and content around what the brand does. The company may also need to find popular Snapchatters within its niche that would genuinely be excited to help promote the brand to the target market.

Website/Mailing Effort

The utilization of online marketing and mail advertising would be fundamental to promoting AppDe Store games online. However, this is not only part of the company's core marketing channels but also one of the most effective and efficient marketing tools available today. Online marketing generally provides a cost-effective, easy to use way to reach potential customers. These adverts would help to reach core customers and create one-click gateway to redirect prospective customers towards the official website of AppDe Store.

Search Engine Optimization (SEO)/Search Engine Marketing (SEM)

Internet searches are by far the most common activity on the internet and therefore it is crucial to appear among top results when customers search for keywords related to educational games and app to help people with dementia and increase memory of individuals. The company will implement an aggressive search engine optimization strategy, whereby it will optimize contents using keywords that are peculiar to its business activities. By optimizing the website's content, will organically aggregate higher on Google, Bing, and Yahoo search engines.

Offline Initiatives

Word-of-Mouth

Being a company with great prospects in the market, it is expected that AppDe Store further penetration in the industry would be aided via marketing strategies that have the capability to wholesomely inform prospective customers of the matrix of value in the brand. Word of mouth approach would help to spread the information about the quality of the games with absolute confidence. The company shall invest in interpersonal relationships, efforts as warmth greetings and open-ended question about how to serve customers better shall top its strategies in maximizing word-of-mouth advantage.

Referral Marketing

Positive testimonials and reviews are one of the strongest forms of advertising and can be a key decision point for potential customers considering downloading AppDe Store games/app. Target customers are extremely inclined to discuss their experiences with friends, families, and colleagues in various communities; thus, resulting in customer base expansion and global business opportunities. Therefore, a referral program shall be developed to mobilize and maximize target market's interest.

Events

Special events would provide one-on-one interactions between the personnel of AppDe Store and participants. The company shall pronounce its brand through its marketing programs and endeavour to participate in expo events in the operating environment. The management may offer to give speeches at events to create further awareness about the company's business activities and affirm the circulated word of mouth advantage in favor of the brand.

For example, AppDe Technologies will organize an event to train 10-20 talented young students to have super brains and showcase them to the public.

Video coverage of the memory training sessions with these students, as well as the before/after transformation will be distributed all over internet and the tuition centers of our partners.

Networking

The company shall leverage on the management team's networks in the market to generate leads and connect with business opportunities that could increase the company's customer base, annual turnover, and business growth in the industry. AppDe Store will foster partnerships with Malaysia memory sport organization, women brains project, Alzheimer's Association and Brilliance Brain Enterprise.

Lead Generation Plan

Leads for AppDe Store will be generated through the following means:

- Customer referrals.
- Online advertising and pay-per-click advertising on Google AdWords.
- Print advertising in monthly newsletter and magazines.
- Referral program by issuing tokens to any referred friends. Expected to generate 100,000 customers and downloads in token sales and increasing subsequently.

Pricing Rationale

Cost-effectiveness and value are two fundamentals that are synonymous to customer behaviors. Therefore, AppDe considered the peculiarity attached to each segments of the market and adopted a pocket-friendly price model that commands increasing patronage. In setting the price, factors as fixed and variable costs and competitions has been considered.

The pricing strategy is based on charge per play or per item purchased by using APPDE Coins. AppDe followed a dynamic pricing model with a focus on increasing yield for the company. The company will neither over charge, nor charge substantially below the standard prices for its core offerings. AppDe will provide users with a reasonably-priced opportunity to play top rated games anytime and anywhere.

In addition, AppDe will offer premium online training courses for customers who are interested in learning advanced memorization techniques.

Sales Strategy

AppDe sales funnel will basically involve directing online or social media traffic to its website or AppDe Store through social media ads, video testimonials, promo/discount campaigns, influencer mention.

Apps on AppDe may operate both freemium and free pricing model depending on the kind of app to be downloaded. Also, training courses will be sold through video testimonials from successful students and events that can draw the attention of potential customers.

AppDe will also work closely with tuition centers and ensure programs are sold through these companies.

APPDE Coin will be used for programs sign up. 5% Discount will be given if payment is made using APPDE Coin. This will increase the APPDE Coin's price and usage.

FINANCIAL PLAN

Financial Requirements & Use of Funds

AppDe Technologies is looking to launch a private token sale to raise $10 million from the sales of AppDe coins to the public. Following the acquisition of the needed funding, the company intends to allot the funds in the following way:

- 25% of the total funding will be used for Sales, marketing, A&P, and commissions.
- 19% of the total funding will serve as reserves and will also be invested into the company's memory training programs, blockchain trainings for developers, training/tuition centers, and other investments.
- 16% of the total funding will be used for software development expenses.
- 15% of the total funding will be used for operations and travel expenses.
- 15% of the total funding will be saved in the bank and will serve as cash flow for everyday expenses.
- 5% of the total funding will be used for Corporate Social Responsibility (CSR) related projects.
- 5% of the total funding will be used for hiring professional services (a team of consultants and attorneys).

The foregoing breakdown of funds is designed to manage the platform's long-term profitability with its intention to maintain minimal operational risks. The management of AppDe Technologies is committed to taking business decisions that support token growth. A table showing the breakdown of funds is also displayed below:

Funds breakdown	Allocation	In %
Sales, Marketing, A&P, Commission	$2.5 million	25%
Reserves & Investment	$1.9 million	19%
Software Platform and Game Development	$1.6 million	16%
Cash Flow	$1.5 million	15%
Operations and travel expenses	$1.5 million	15%
Community, Social and Charity Services	$0.5 million	5%
Advisor and Consultation Fees	$400,000	4%
Legal services	$100,000	1%
Total	$10 million	100%

Tokenomics

A total of 250 million tokens will be generated. 150 million tokens will be sold via private sale to raise $10 million crowd sales for the company. Unsold tokens out of 150 million tokens will be burned to ensure that the company is genuine and to support tokens' price growth and value increase. A detailed breakdown of the token distribution alongside its equivalent USD market value is shown in the table below.

All tokens sold in exclusive private sales and private sales will be locked for 18 months. The strategy is to ensure long term investment for big purchases and stability of the token price.

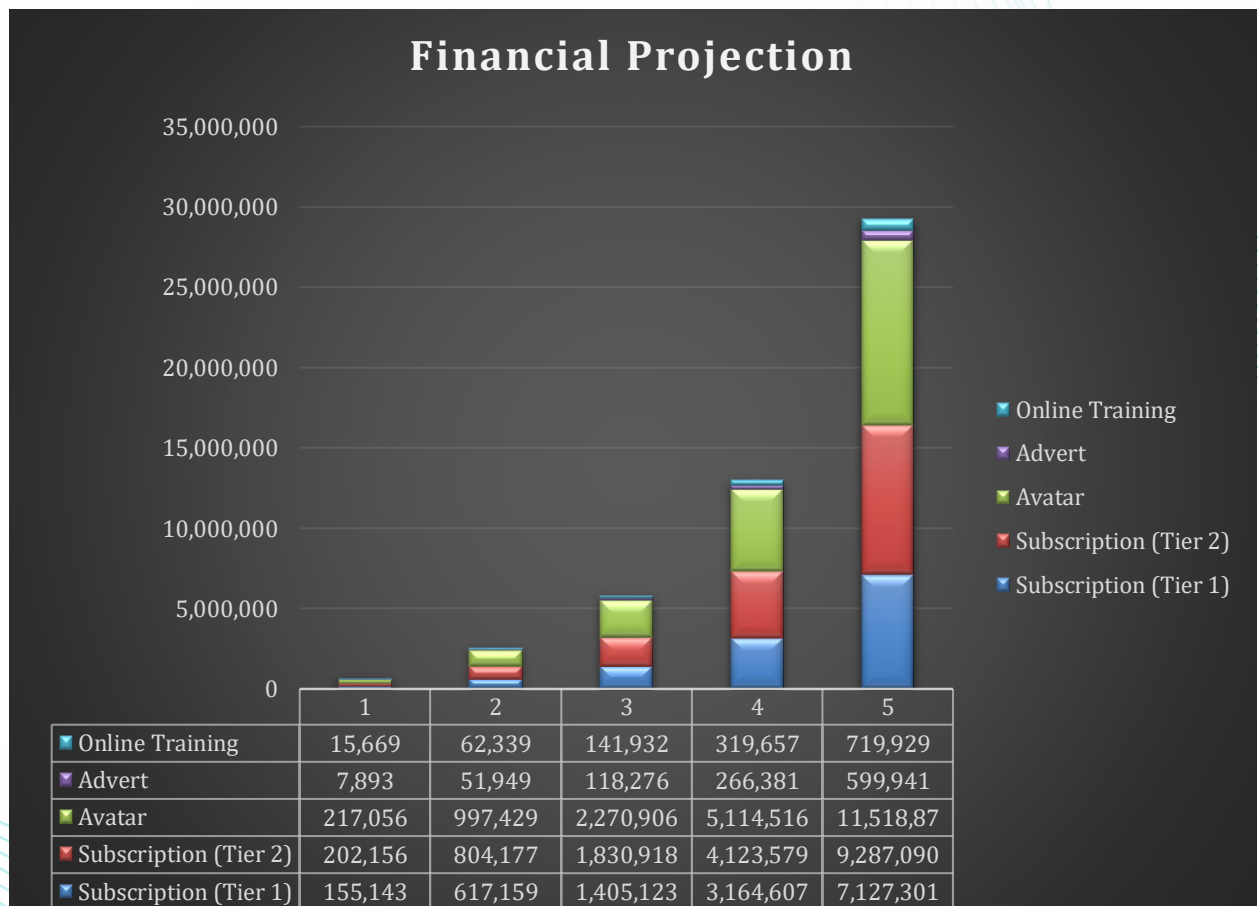| TOKEN DISTRIBUTION	NO OF TOKENS	TOKEN VALUE	MARKET VALUE
Token Reserve (30%)	300,000,000	0.030	$9,000,000
Charity to Associations (5%)	50,000,000	0.030	$1,500,000
Advisor & Team Fees (7%)	70,000,000	0.030	$2,100,000
Referral Fee (4%)	40,000,000	0.030	$1,200,000
Sales Commission (4%)	40,000,000	0.030	$1,200,000
Marketing, Promotion, Partnership (15%)	150,000,000	0.030	$4,500,000
Token Sales (35%)	350,000,000	0.030	$10,500,000
Grand Total	**1,000,000,000**	**$0.030**	**$30,000,000**

Token Sales Plan

AppDe Technologies is planning to raise a hard cap of 10 million USD. Token prices are as listed below. Token listing is targeted for July 2023.

Sales prices are estimations and could be different from ETH, BTC, LTC as well as the demands. Total tokens sold will be hard capped at 10 million USD without selling more than stated in diagram below.

TIMELINE	EVENT	ESTIMATED TOKEN PRICE (USD)	MAX TOKEN SALES	ESTIMATED VALUE (USD)
Feb-22	Exclusive Private Sale (10%)	USD 0.01	100,000,000	1,000,000
Jul-22	Private Sale (10%%)	USD 0.02	100,000,000	2,000,000
Nov-22	Pre ICO Sale (2.5%)	USD 0.04	25,000,000	1,000,000
Mar-23	ICO Sales 1 (4.5%)	USD 0.45	45,000,000	2,025,000
May-23	ICO Sales 2 (8%)	USD 0.05	80,000,000	4,000,000
MAX FUND TOTAL				10,000,000

Financial Projections

The company's financial projection shows that the company can utilize its assets to stimulate business growth in the nearest future. The company projects a steady annual growth rate.

	1	2	3	4	5
Online Training	15,669	62,339	141,932	319,657	719,929
Advert	7,893	51,949	118,276	266,381	599,941
Avatar	217,056	997,429	2,270,906	5,114,516	11,518,87
Subscription (Tier 2)	202,156	804,177	1,830,918	4,123,579	9,287,090
Subscription (Tier 1)	155,143	617,159	1,405,123	3,164,607	7,127,301

THE TEAM

Management and Staff

Based on our goals, objectives, and keys to success of AppDe, it has created a management team comprising of:

Lis Tan – CEO: Lis has been a banker for 12 years and has an extensive network of business connections locally and internationally. Her most recent ventures include blockchain consulting and business management. An avid gamer and being heavily digitally connected herself, she understands the online game community.

Seow Ai Leen — CMO: Ai Leen has been working in the childhood education sector for 10 years. She is familiar with the aspects of sales and marketing to the education segment.

Francisco Bastardo – CTO: Francisco is a highly skilled software and web developer, with years of experience working with many programming languages and technologies, he has mastered the best practice of Web architecture, app design, blockchain technologies and smart contract.

Matthew Ong – Product Developer (Game): Matthew's experience spans over various digital and tabletop aspects. An experienced game and program tester and developer, Matthew is familiar with many programming languages. Further, Matthew himself is a game creator, having created games that focuses on the psychological aspect.

Stanley Lee — BDM: Stanley has been in Finance for 14 years and has his own technology company. Having experience in starting up a tech company from scratch, Stanley is well versed with the aspects of start-up growth and market research.

Advisors

Richard Trummer — ICO Advisor: Richard is one of the top ICO advisors in ICO Bench with numerous ICO project experiences. He is an Internet Marketing Expert specialized affiliate marketing and Facebook-ads traffic, selling high ticket products.

Lev Umanov — Token Price Stability Advisor: Lev is one of the best cryptocurrency price forecast experts in the market. He has numerous years in cryptocurrency industry and currently consultant of multiple exchanges. Lev has forecast the price stability of AppDe tokens.

Janet Lee – Advisor: She has spent more than 25 years working in the fields of wealth management, money markets & capital markets with banks & stocks brokering houses inclusive of Citibank, UOB, Phillips Securities, Westcomb Securities & OCBC Securities as a Relationship Manager, Associate Director, Financial Analyst & Stock Broker. She is currently CEO of Venture Capital Network Pte Ltd & had successfully help a few local SME owners to pitch in China for fundraising & OTC listings matters. In recent 2 years she has been regularly active in ICO listings advisory & fundraising campaign. In 2018, she successfully helped two local ICO projects listed on The Global Blockchain Exchange (GBX) as a sponsored film to the exchange.

Wan Wei – PR Advisor: Wan Wei is a seasoned PR and marketing professional in the emerging tech space. Passionate about mental and physical wellness, she is also a highly regarded bilingual speaker and educator in the blockchain industry.

Keys to Success

AppDe Technologies recognizes that success in business is based on unconditional commitment and focus on transforming business goals into market reality. Being a company with the commitment to proffer solution to needs through mobile apps/games poised to prevent dementia and improve memory of individuals; it is believed that the most important factor that defines success is value.

Keys to success include.

- Creating an ecosystem and a go -to platform for the mental health industry
- Creating more super brain humans with at least 10,000 super brains in 7 years.
- Adapting to primary and secondary school student's tuition center industry[17].
- Aggressive marketing through SEO, social marketing, and targeted advertising.
- Recruitment of experienced and committed workforce.
- Working closely with dementia and world memory championship market.
- Building and maintaining high reputation for excellence in the industry.
- Availability of trained, enthusiastic, passionate, and knowledgeable personnel with answers to customer's needs.
- Adhering to strategic plans, effective communication, customer satisfaction and management of financial plans in accordance with its corporate goals.

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AppDe Whitepaper   www.Appde.io

DISCLAIMER

This white paper describes the plans of AppDe technologies technical, marketing and business directions, however we are entitled to change any of our plans in this white paper.

The token economy is relatively new and incredibly innovative. Tokens could be impacted by regulatory actions, including restrictions on ownership, use, or possession.

There is no guarantee that the price of APPDECOIN selling in exchange will increase in value, provide a return, or will have sufficient adoption and liquidity to enable exchange for other assets.

Owning APPDE tokens does not constitute a share of, equity of, or ownership of the AppDe technologies platform. This document does not constitute a prospectus of any sort. The tokens involved with APPDECOIN do not in any way involve any form of ordinary shares in AppDe Technologies.

All buyers and users of our platform are bind with token sales agreement, by buying our coin and using our platform you automatically agree to token sales agreement.

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