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Omni AIoT US

ENTERING THE MATRIX

Understanding the Intelligent Digital Universe of the Omni AIoT US portfolio

OMNISCIENCE CAPITAL RESEARCH

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Omni AIoT US: Entering the Matrix

Understanding the Intelligent Digital Universe of the Omni AIoT US portfolio

- Artificial Intelligence (AI) is a multi-trillion-dollar opportunity and the Omni AIoT US portfolio is one of its kind investment opportunity that provides exposure to this transformative theme.
- This report provides insights into the current segments of the AIoT Portfolio.
- Artificial Intelligence is at the core of the AIoT portfolio with three segments of Digital Life, Digital Work and Digital Brain. Read on to learn about the three segments.

As of 2020, there are more bytes in the Digital Universe than stars in the real Universe!

More than 59 zettabytes (ZB) of data will be created, captured, copied, and consumed in the world this year, growing at a CAGR of 26% through 2024 - IDC Global [DataSphere Forecast](#)



AIoT Portfolio Segments

- Digital Life
- Digital Work
- Digital Brain

With zettabytes of data, the World is already in the Matrix. The data is roughly equally divided between the Consumer sphere, i.e. Digital Life Data and the Enterprise sphere, i.e. Digital Work Data. Covid-19 has further accelerated this trend of digitization of the physical world. OmniScience Capital had launched its AIoT (Artificial Intelligence and Internet of Things) portfolio in 2018 to capture this multi-decadal, [multi-trillion-dollar opportunity](#). During this nearly 2-year period the strategy has gained by nearly 38% (based on the model portfolio gross returns).

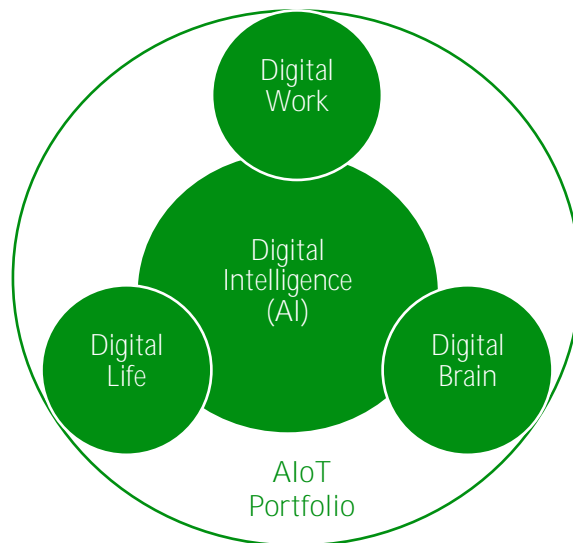
At **the time of AIoT's launch**, there were hardly any pure-play AI-focused funds and the situation today is the same. There are ETFs marketed as AI ETFs, but a second look makes it clear that most of them are just plain old technology funds with no clear focus on Artificial Intelligence or the underlying, enabling, complementary or adjacent technologies, such as, IoT, 5G, Big Data, Cloud, Analytics, etc.

AIoT is probably the best bet for an investor to take exposure to the Artificial Intelligence theme. Currently, the OmniScience AIoT Universe has nearly 200 companies which are focused on AI or AI-ecosystem enabling technologies. The AIoT strategy selects a portfolio of 15-25 stocks which are consistent with **OmniScience Capital's Scientific Investing framework** of creating a SuperNormal Portfolio of SuperNormal Companies at SuperNormal Prices.

The Digital Universe: Cloning the Physical World

More and more aspects of the physical world are being digitized. **From a human being's perspective**, the Digital Universe can be segmented into 3 segments, viz. Digital Brain, Digital Life and Digital Work.

The Digital Brain provides the storage, transmission, and processing of the digital data. The Digital Life captures different aspects of an individual's life and Digital Work captures different aspects of an Enterprise's existence.



In the following, we explore these concepts further and provide some more insight into what kind of products, services and platforms make these possible. *Some of the companies mentioned might be in the AIoT portfolio at different points of time but these are not recommendations to buy, hold or sell them.*

Investors should understand that the decision to include a company in the portfolio, and its weightage in the portfolio, are sophisticated decisions based on the fundamentals of the company, the opportunity size it is exposed to, its preparedness in terms of intangible assets, such as Research and Development assets and Customer Relationship or Market Development assets, its expected future cash flows and whether the price being paid provides for an adequate or *satisfactory* expected return, as Benjamin Graham would put it. **The most important aspect which is, typically, ignored in “growth investments” is the *element of safety*** which is central to the Scientific Investing Philosophy. The concept of *Survive & Thrive* embodies this aspect of the philosophy. The portfolio selection is also a function of what other opportunities and their expected returns are in the AIoT Universe of ~200 stocks.

The Scientific Investing Philosophy and Framework incorporates the above in a well-defined process and helps in selecting the portfolio at any given point of time.

1. Digital Life

The understanding of Digital Life begins with the concept of a Digital Avatar or Digital Clone or Digital Twin of an individual.

Digital Avatar or Digital Clone or Digital Twin

The Digital Twin is the digital representation of an individual, or a particular aspect, of their life. Each person who uses any digital platform is creating his digital assets as well as a Digital Avatar as he goes along. The longer the person uses the digital platform the closer is their Digital Avatar to their actual personality.

(Here the meaning of “avatar” is not that which is typically understood in English as an icon or figure representation in a game, but rather the sum total of the data which put together represents certain aspects of an individual. The meaning is

closer to its traditional meaning in Sanskrit which is the manifestation of an idea or a person; in this case, digital manifestation of a person.)

Take the case of a Facebook user. The FB user's timeline is the personal biography of that person, including their time-stamped photographs, their videos, their time-stamped opinions through their postings, their sharing of other's posts, their comments on those posts etc. Over time, they are connected to their friends and family network as well. This creates a digital avatar of their real life, and in many cases, this could be richer in content than their offline social life, since in the digital world distances are not a limiting factor. Friends and family who are staying across the world can be interacting in real time and sharing their news and views with each other. Important events in the network can be celebrated together with the social network.

Different aspects of a person's life are stored in different Digital Platforms. For example, the Digital Avatar of person's requirements in terms of goods and services is captured in Amazon and Yelp. The Digital Avatar of a person based on his tastes in entertainment products, such as, books, music and videos is captured in Amazon kindle, Amazon Prime Video, Netflix, YouTube, Apple Music and Apple TV+, among other similar digital entertainment platforms.

Similarly, the Digital Avatar of a person's personal and professional life are stored in their personal email id or the mobile data backup drive which is used for their professional, business, financial and regulatory transactions, such as, network contact list (digital rolodex), payments, banking, taxation, personal business dealings, career development & learning, job search and resume building etc. For example, Gmail id from Google is a popular personal email id, the Apple iCloud backup and/or Google Drive, and LinkedIn profile are **Digital Avatars of a person's professional persona.**

Twitter is an example of a person's Digital Avatar in terms of their preferences for, primarily, consuming current events. The events could be trending topics on Twitter or they could be trending topics in the personal network of the person. However, more often it allows a person to follow events and personalities connected with those events or types of events and eventually help the person build a digital community which could be quite different and spread-out geographically compared to their offline personal, social or professional network. However, the common thing in this Digital Network is the shared interests in terms of current events or themes. That is the unifying bond in this Digital Community. This again creates a different Digital Avatar of a person and its own Digital Community.

Digital Avatars of a person's daily commute and other frequently travelled locations is captured in Google Maps and Apple Maps. The AI-based assistants, such as, Siri or Google Assistant or Alexa again capture a person's Digital Avatar and are able to provide efficient help in terms of what a person needs based on their past usage and inferred preferences. Eventually, this is going to be the Digital Avatar of a person's home behaviour and preferences as the Smart Home Devices like Amazon Echo and Google Home etc. become more prevalent and connected with other devices in the Home.

Digital Avatar of a person's health and fitness are captured in health apps and wearables, such as Fitbit, Google Fit, Apple Health App, etc. These are getting more and more sophisticated and can compile a full history of a person which then becomes analysable and open to predictive analytics and AI.

All of these Digital Avatars become Digital Assets of a person and once a person has invested sufficiently in these it becomes difficult to give up these highly valuable Digital Assets. Thus, a person's Digital Avatar and their Digital Assets become a valuable anchor for their overall life.

Digital Life – Life from Home

The Digital Life segment is constituted of the companies that offer products and services that are transforming our personal lives. The transformations can further be classified into 4 key themes of transformation based on the activities that are getting digitised. The exhibit 1 below illustrates the key sub-themes of Digital Life, the infrastructure layer on which they are built on, and the portfolio companies that are offering these products and services.



Exhibit 1: Digital Life segment represent the various sub-themes that are changing the personal life space

Source: OmniScience Capital Research, Third-party data sources

Shop from Home

Shop from Home theme recognizes the shift in the consumption pattern away from the traditional retail and toward ecommerce. In the US, for computer and consumer electronics product category – 43% of the total sales is happening online. For apparels & accessories it is 29% and for some categories such as Books, Music and Videos it is more than 50%. Amazon holds around 50% share of online retail with second ranked not reaching even the double-digit market share. There is also a shift to online platforms such as Yelp as a guide to local businesses. This has made online as one of the fastest ways to acquire customers even for local businesses such as restaurants, shopping, or home services.

Live from Home

A host of new offerings which are based on new-age technologies is transforming the life at home. The concept of ‘Smart home’, as it is popularly known, is based on the technologies such as IoT, Robotic Automation, 5G and Cloud among others which are enhancing the convenience with interconnected devices that can be programmed or controlled remotely. The surge of smart devices (& assistants) such as Amazon Echo (Alexa), Google Home (Assistant) and Apple Homepod (Siri) brings a human touch and make the human-to-machine interactions more convenient. Smart wearables add another enhancement to the Live from home theme which is focused on how home living is getting transformed.

Play from Home

Entertainment has seen the greatest impact of the transformation brought in by digital technologies. With OTT platforms such as Amazon Prime, Apple TV+ and online platforms such as YouTube, the at-home video streaming has grown significantly. Music subscriptions are also on rise. These two trends are taking away from the traditional entertainment

avenues such as multiplexes and cable TV. With enhanced mobile devices, gaming consoles, such as, Xbox and platforms, such as, Google Stadia, Gaming at home has evolved.

Learn from Home

The online delivery mechanisms have taken centre stage after the Covid19 crisis. However, even before the online courses and concepts such as MOOC (massive open online courses) have been popular all through last 5 years. YouTube, MS Teams, Google Meet or Facebook Live have become preferred medium for learning engagement whether it is schools, colleges, professional courses or personal interest areas. The Learn-From-Home theme captures the value migration from traditional avenues of learning to digital platforms.

2. Digital Work

Digital Avatar or Digital Clone or Digital Twin of the Business

Just like the Digital Avatar of an individual, the digital data of a business is the Digital Avatar of that business. For example, the enterprise data of customer transactions provides the Digital Avatar of the enterprise’s customer relationships. An analysis of the Digital Avatar of the customer transactions could provide as good an understanding, or sometimes an even better one, compared to the non-digital understanding of the customer interactions of that business.

Similarly, another aspect of the enterprise’s Digital Avatar is in the ERP data. The supply chain data, again, provides the Digital Avatar of yet another aspect of the enterprise. The HR systems store the Digital Avatar of the enterprise’s full-time employees and other human resources. Multiple aspects of the businesses are stored in a digital format and all these put together can be used to recreate the Digital Avatar of the business providing a near-complete digital representation of the business. This is what we call the Digital Avatar or Digital Clone or Digital Twin of the business.

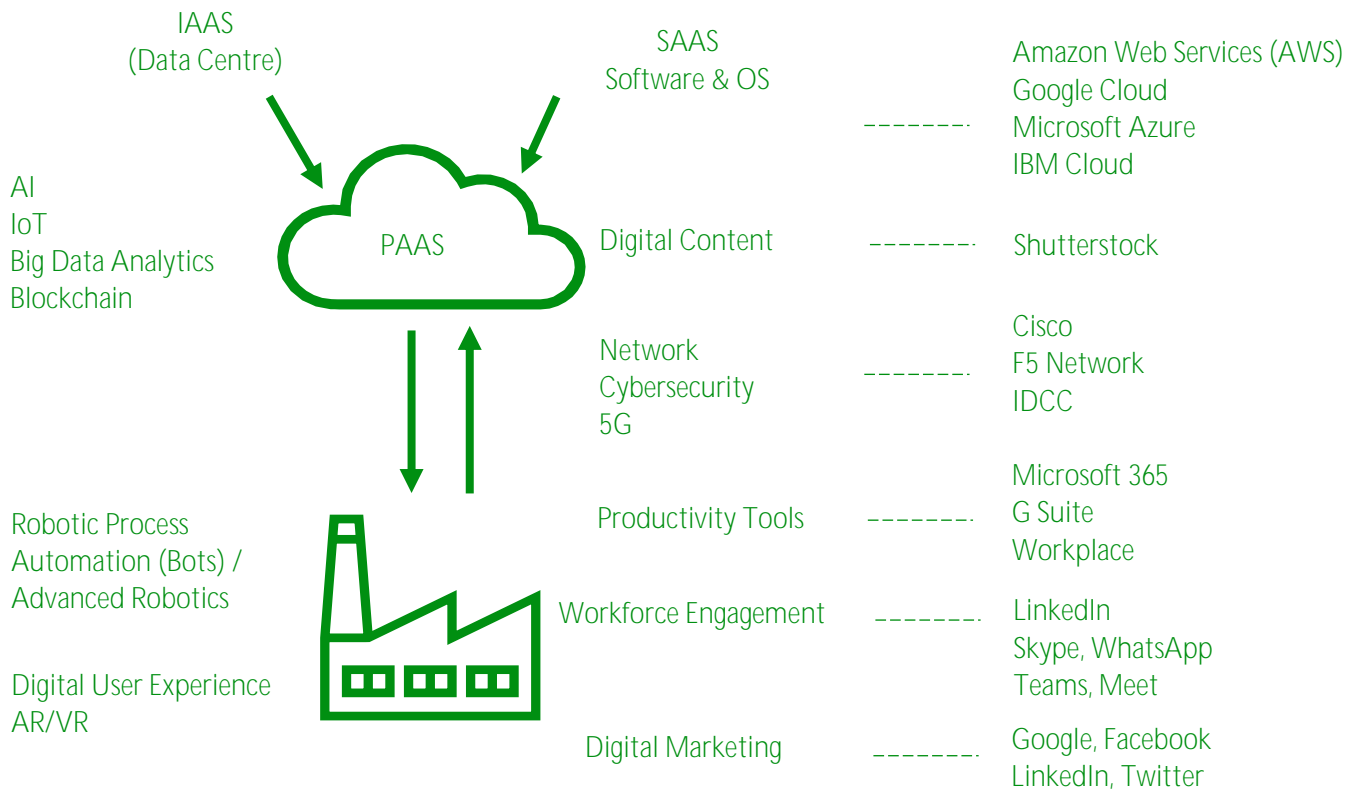


Exhibit 2: Digital Work segment components that are transforming businesses across sectors

Source: OmniScience Capital Research, Third-party data sources

Digital Transformation

Digital transformation is changing the way business is carried out. The current trend has mandated every business to redesign their operational processes, customer engagement processes and workforce engagement processes. The exhibit 2 summarises various technologies and components of the digital transformation of businesses—we call this Digital Work—and the key product offerings from the portfolio companies for each segment.

Cloud – Digital Infrastructure

One of the key elements of this transformation is Digital Infrastructure and Cloud Platforms. The PaaS (Platform as a Service) concept sits at the heart of it. Majority of Data centres worldwide have migrated to cloud. As of 2017, cloud workloads represented 86% of all data centre workloads worldwide and this is expected to be 94% by 2021. AWS, Azure, Google Cloud, and IBM Cloud are the four largest players providing the cloud platforms. Cloud has also become the default platform for enterprise software. The cloud ERP market is expected to more than double in the next 5 years driven by demand to streamline and digitize business processes.

Network – Digital Connect

The new age connectivity with 5G Technology is going to transform business processes and offerings. Network and security infrastructure have gained unprecedented importance in the all-things-connected world of cloud and IoT. IDCC holds key patents on 5G and licenses it to mobile and consumer goods companies that have started using 5G technology. Cisco and F5 Network are the dominant players in the networking business.

Business Transformation

A. Production & Business Process

Production and business processes are transforming across industries including agriculture. Advanced robotics, for automation of physical tasks, and Robotic Process Automation (RPA), for automation of business processes, are streamlining all activities including production, supply chain management, design & development. The adoption of advanced technologies such as AI, Machine Learning, Blockchain, 3D printing is on the rise to improve delivery to end customers.

B. Customer Engagement

Every business is engaging with customers through a digital platform today and creating a seamless, intuitive, and engaging digital customer experience (DCX). Starting from customer acquisition, to delivery of goods and services, to after sale services, various digital platforms are used. Digital ad spending has already taken over traditional media ad spending. Businesses are using social media platforms such as Facebook, Twitter, LinkedIn to engage with potential and existing customers. Almost all businesses offer an online platform to sell their offerings. Payments is another area where digitization has enhanced transactions convenience.

The next frontier is the use of advanced technologies such as Artificial Intelligence technology, Big Data analytics and cloud to deliver real-time customized offerings to every client and use virtual and/or augmented reality technology to improve experiential engagement.

C. Workforce Engagement

Digital tools have improved workforce efficiency and engagement. Productivity tools such as Microsoft 365, G Suite or Workplace by Facebook help employees organise their workflows better and help them collaborate with other team members. Remote working capabilities have increased tremendously with communication and collaboration platforms such as Microsoft Teams, Google Meet, Skype, or WhatsApp.

3. Digital Brain

The Digital Brain segment has two key sub-segments – Digital Mind and Digital Neuron. The Digital Mind is the processing part and the other part is built up of storage, transmission, and other semiconductor components. Exhibit 3 below represents the various components of the Digital Brain segment and the respective offerings from the current portfolio companies.

Artificial Intelligence Chips

AI chip is one of the heavily contested space among various chip manufacturing, cloud platform and device manufacturing companies. Various specialised processing chips have been developed for AI applications. GPU and FPGA are two evolving configurations currently used for machine learning, image recognition and other such applications which, given the complexity, require computer systems such as artificial neural networks (ANNs) inspired by the biological neural networks. Application-specific Integrated Circuit (ASIC) accelerators with specific designs to optimise memory usage and use of low precision arithmetic is emerging which could have up to 10 times more efficiency.

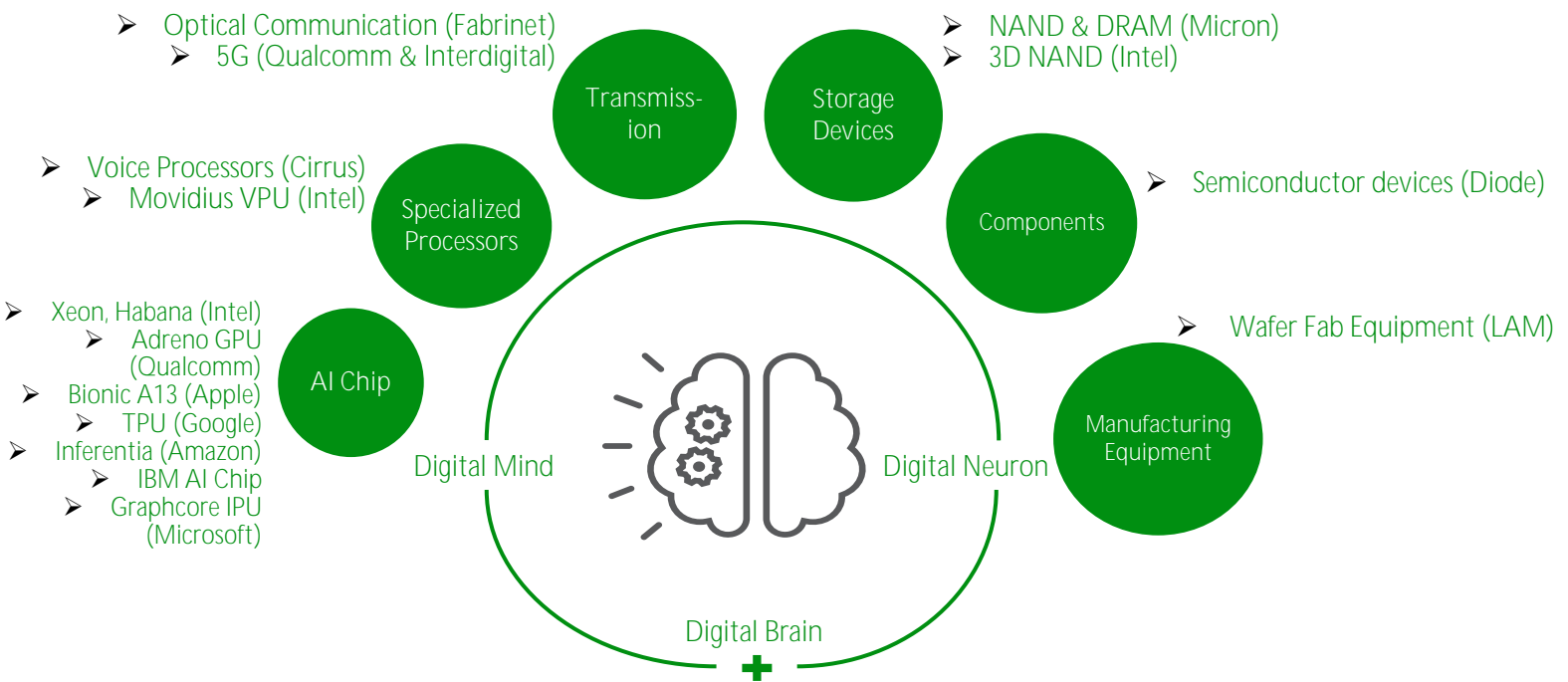


Exhibit 3: Digital Mind and Digital Neurons make up the Digital Brain segment

Source: OmniScience Capital Research, Third-party data sources

Specialized Processors

The second part of the digital mind consists of the sensory capabilities such as computer vision (Movidius, Intel), digital display (Qualcomm), audio/video processing (Cirrus Logic, IDCC, Xperi), natural language processing (Dialogflow by Google, IBM, Microsoft, Amazon, Apple) and optical sensing (Fabrinet). Major advances have been achieved by companies specialising in each of these areas.

Storage Devices

Memory chips or the digital data storage devices (volatile and non-volatile technologies) account for the largest piece in the semiconductor devices pie. The growth of data is driving strong long-term demand outlook for DRAM in the mid-to-high

teens and for NAND in the 30% CAGR range. The covid-19 crisis has increased the demand due to enhanced cloud-driven Life-From-Home activities that include higher e-commerce, e-learning and digital entertainment activities. Micron has **leadership position with DRAM, NAND and 3DXP which is the world's fastest SSD**. Intel has also launched Optane memory device based on 3D XPoint technology which is much faster than the current SSDs.

Transmission

This segment focuses on the companies that connect various components of the Digital Brain. Portfolio companies such as Cisco, F5 Network, Fabrinet and IDCC design, create and license technologies such as 5G and Wi-Fi, and components such as optical devices and modems that provide the connectivity infrastructure.

Component & Equipment

Diode, LAM research and Xperi are companies that provide various microelectronic components, Wafer Fabrication Equipment (WFE) and licensing of semiconductor production technologies, respectively. These companies provide critical infrastructure to the semiconductor industry. Both have strong outlook driven by the expanding use cases for their end products.

Segment Performance – Month of July 2020

The segment performance of the three segments, viz. Digital Life, Digital Brain and Digital Work are provided below. The performance of all the segments is extraordinary given that this is a one-month performance. The Digital Life segment stands out as the superior performer compared to the other segments. The monthly performance could be significantly lower in future months since a 7%-10% monthly performance cannot be expected in most months.

Segment	July 2020 Return
Digital Life	11.0%
Digital Brain	7.5%
Digital Work	7.5%
Nasdaq 100	7.4%

Exhibit 4: Performance update for Omni AIoT US segments for the month of July 2020

Source: OmniScience Capital Research, Third-party data sources

Conclusion

The current status of the Digital Universe, comprising the Digital Life and Digital Work enabled by the availability of the Digital Brain is at the stage of Entering the Matrix. The Matrix, i.e. the Digital Universe, is becoming the primary mode of interaction of a person or business with the rest of the World. This Digital Universe is growing exponentially enabling the widespread usage of Artificial Intelligence given the availability of large amounts of data combined with tremendous computing prowess.

Various consulting and research services have estimated that the impact of AI (and related Digital Transformation) on the global economy will be in 10s and 100s of trillion of dollars over the next several decades. These are likely to dominate the economy, individual and business lives as illustrated earlier in this report.

Surprisingly, there are hardly any funds focused on this theme, though, several ETFs are marketed as such. In reality, most of these ETFs just provide exposure to technology stocks in a market-cap-weighted allocation. To our knowledge, the AIoT strategy is the only pure-play exposure to this theme based on a proprietary AIoT universe of nearly 200 US listed stocks

which are focused on Artificial Intelligence, Internet of Things, and enabling technologies, such as, 5G, Big Data, Cloud, Analytics, Cyber Security, Blockchain, AR/VR etc.

The AIoT portfolio is a portfolio of 15-25 stocks selected using the Scientific Investing Framework applied to this AIoT universe. The Scientific Investing framework accounts for the potential growth opportunities these companies are exposed to, the conservative estimation of their revenues and cash flows in the future and whether the current market price is at a significant discount to their intrinsic value based on this. In short, AIoT is a SuperNormal Portfolio of SuperNormal Companies at SuperNormal Prices.

The AIoT portfolio keeps evolving and changing as the companies in the AIoT universe enter and prove different growth vectors—or exit—thus, changing their intrinsic values, as well as, the change in market prices thus changing their discounts from intrinsic values.

OmniInsight

“Most market participants chase alpha but get risks, while one could chase safety and get alpha”

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