

Ideological Reference Architecture (IRA): An Epistemological Interpretation of Quantum Mechanics¹

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Abstract

With this work, we introduce a system of ideological metaphysics which is primarily born out of an epistemological interpretation of Quantum Mechanics (QM). Our interpretative stance follows a long line of consciousness (what we call *mind*) based on interpretations, or explanations, for the so-called measurement problem in QM, a position held by physicists (and mathematicians) such as Von Neumann, Wigner, Bohm, Stapp, Manousakis, Blaha, and Pradhan among others. Given this perspective, we conceive of the measurement problem to be a function of the boundary condition between mind and matter itself, a condition we wish to shed light on by abstracting the problem of measurement itself out of physics proper and (more directly) into the domain of philosophy explicitly using modern conceptions of epistemology and information theory, as well as quantum measurement theory, to construct a system of metaphysics, based upon knowledge and information processing and theory, that sheds light on the relationship between mind and matter generally. In this context, akin to Alan Turing's work in theoretical computer science in 1950 which introduced the concept of a theoretical computing machine which ultimately provided the basis for modern computers, we introduce the notion of an ideological computing machine, or IRA (Ideological Reference Architecture), which is constructed based upon modern software development models and paradigms (object oriented programming and design primarily) which represent the de facto standard used by information processing systems in modern computing applications. We, however, take the additional conceptual abstraction from information to *knowledge*, after which IRA can be viewed within the broader philosophical dialogue, both in

¹This paper is an abridged version of a larger work entitled *Ideological Reference Architecture*, or IRA, with a subtitle that matches the title herein. Hence, we affectionately call this paper *Little IRA*, to distinguish it from its sibling, *Big IRA*.

its Western (Plato, Aristotle, Descartes, Kant, Schopenhauer) as well as Eastern (Vedanta, Samkhya, Daoism) dialects. To this end, we hope this work can serve as a framework for comparison and further development as a sort of reference architecture, in philosophical, theological and (theoretical) scientific circles, to provide precision and clarity to metaphysical discussions in the same way the Turing Machine provided for a more precise definition of computer system design (and limits).

Keywords

Metaphysics, Theoretical Computer Science, Cognitive Science, Information Processing, Epistemology, Quantum Mechanics, Idealism, Plato, Kant, Daoism, Taoism, I Ching, Book of Changes, Samkhya, Yoga, Schopenhauer, Theoretical Physics

1. On Science, Physics & Knowledge

We seemed to have reached a place in the human understanding where Physics, the intellectual (really academic) discipline of the description of the world of *matter*, and Psychology, the intellectual discipline of the world of *mind*, are on a sort of collision course of integrated understanding the likes of which have not been witnessed since ancient times, where the most if not all of the prevailing worldviews considered the realm of the mind, or the world of spirit, to be not the same as the physical world, the world of matter, but nonetheless very much related to it and in a sense fundamental to its existence.

At the root of all the major theological and philosophical traditions (and even the minor ones), you find this sort of gray, fuzzy distinction between the realm of mind and the world of matter. In most cases, if not all, these worlds are bridged by a sort of third, correlated and more fundamental principle upon which both the mind and the world are predicated. Those human beings are as part of Nature rather than separate from it. This is in fact where the word physics comes from, from the Greek *physis* which means Nature.

This is a very old idea, that we are a part of the universe and are connected to it in a very fundamental way, and it is not until much later that this split between mind and matter, subject and object, becomes the prevalent worldview, really the signatory principle that comes out of the Enlightenment where theology (religion) is supplanted by science for good. Descartes is typically blamed for the split you could say, as sort of the father of Western mind-body dualism (*cogito ergo sum*), but it is with this classic bifurcation from which the great floodgates of Western Science opened leading to breakthrough after breakthrough of technological advancements that have led us to a place where you can read the words I type on a page today, digitally at your desk or home office tomorrow.

The problem with the end of physics as it stands today is that it ultimately hits a sort of objective realism barrier at the Planck scale, the scale at which Relativity

breaks down and we are confronted with a new paradigm of not just Physics, but of measurement itself. At this level of reality, we are forced to confront the idea of meaning directly, thrusting us back into the very world of philosophy that we had so vehemently disregarded when we ushered in the Age of Science. This is where Quantum Mechanics leads us ultimately, back to these very same questions about meaning but not necessarily about the meaning of life or the cosmos but the meaning of meaning itself. How do we bound knowledge and how do we know what we know? Back to first philosophy again, back to metaphysics, Kant is rolling over in his grave to be sure.

So where that leaves us, from a “scientific” standpoint at least, from what we have called elsewhere the *objective realist* (philosophical) position, a position that in no small measure could be argued as characteristic of the modern, Western worldview (and I am most certainly not the first one to recognize or even grapple with this issue), is that while we have a very good understanding of how to manipulate and navigate through and about the world of matter, we are nonetheless left with very real and very meaningful (no pun intended) gaps in our understanding, our knowledge broadly speaking, of what we should be doing with ourselves to take advantage of all of these technologies that are at our fingertips that make our lives so much easier than all of the thousands of generations of humanity that have come before us.

The problem with this of course is that if these questions are left unanswered, if they continue to be cast aside as philosophical musings with no real practical value, we continue along this path of not just empty lives, lives with no real meaning and purpose, but with lives that are not only disconnected from each other but disconnected from the planet and the cosmos itself, which in turn yield to outcomes that have very real, very physical, consequences for not just humanity but for the Earth as a whole. We need to get a handle on these questions in order for humanity to move into the next phase of its existence, in order for it to continue to thrive without destroying its host so to speak. This is the challenge of our Era, the problem that faces our generation and the generations to follow us, this is our great calling.

Solves for these types of problems, the answers to these fundamental questions, must engage with philosophy, and this is how the discipline was conceived of in antiquity at least, what Aristotle called *first philosophy*, which was intended to provide at least some of the answers to these basic questions about how the world came into being and what our place in the world is, and thereby providing some guidance as to how to navigate in the world. It’s from these initial efforts in fact that the word metaphysics itself emerged as the branch of knowledge within philosophy that addressed such questions, a topic to be delved into *after*, “meta”, *Physics*, or *natural philosophy* in Aristotelian parlance.

This is how metaphysics was originally scoped and defined in antiquity, at least in the Western philosophical tradition, and this demarcation between natural philosophy and first philosophy held sway in the West through the Middle Ages until the Enlightenment, after which, from an intellectual perspective at

least, Science, and the scientists who practiced said arts, were finally allowed to do their work unencumbered by the dogmatic ideology of the Church. This subtle and yet profound change in the unshackling of Science from Religion has in turn of course led to the most radical advance of knowledge in the history of our species, giving us the technological infrastructure to feed almost the entire planet, the ability to see into the far reaches of space, and perhaps most significantly with respect to the work herein, the ability to store, process and transmit seemingly limitless amounts of information from anywhere in the world, to anywhere in the world, in almost near real-time.

Science (literally from the Latin *scientia*, or *scire*, the verb to “to know”) tells us how things work, how we can build things for a (presumably) better world, but again it doesn’t address any of life’s basic questions, namely what the true nature of this world is and what we are (supposed to be) doing here. This is, as I have discussed in great detail, a terrible bastardization of the notion of knowledge as it was understood by the very founders of the Western intellectual tradition, Plato and Aristotle in particular who both held much more expansive views of what it is to know and what it is that can be known, a discipline in (modern) philosophy that is known as epistemology, a word whose root comes from the ancient Greek word for knowledge, i.e. *epistēmē* (Valdez, 2019).

Knowledge at some level, given the scientific nature of post-Enlightenment civilization, is equated with science to a large degree, and as such is rooted in a physicalist and materialist conception of reality and as such has limited applicability. The main problem with this, and again emphasizing how important it was and is that science be able to flourish independently of any influence by political or religious institutions (enter academia), is that it includes just half of life experience, maybe even less than half.

The half that science is concerned with of course is an objective reality, the world according to Physics, the world which according to Kant, a philosophical position that we take as fundamental throughout, relates to the world of things, objects per se, as they can be understood to exist independent of human experience, the so-called *noumenal* world. The problem with this, and what Quantum Mechanics brings to the fore, in fact, is that our understanding of the world, our understanding of objective reality, is fundamentally governed by not just observables necessarily, but also by our mind/body complex which is specifically designed to both perceive and conceive of said observables and in turn make sense of them.

For example, to know that a rock weighs 6 lbs. we need to know what weight means and certainly what lbs. means. This seemingly trivial point is brought to the very forefront of Physics itself with Quantum Mechanics, where the very design of the measurement apparatus, i.e. the experiment, itself determines whether or not the thing it is that we are measuring (an electron or a photon for example) behaves like a wave or a particle. Such is the current state of modern Physics, that in fact these subatomic “things” are really not waves or particles like we normally understand these things to be within the context of Classical (Newto-

nian) Physics, but they are something else entirely, flashing, swirling vortexes of energy that adapt to their surroundings (experimental apparatus) and inherently “know” about their environment in a way that crosses the boundaries of space-time as it is understood with Relativity. These are the basic descriptions of the properties of non-locality and wave-particle duality that make the study of Quantum Mechanics, at least from an interpretative standpoint, so darned frustrating at times.

With the “discovery” of the laws of Quantum Mechanics in the first half of the twentieth century, and its fundamentally non-classical tenets, a wide variety of interpretations have cropped up, suggesting that our universe is really a multi-universe, and each of the possible paths of the quantum wave actually corresponds to some form of reality (Dewitt & Graham, 1973), spurring even more abstract mathematical models like string theory that proposes that our world is really nothing but the vibration of these tiny, multi-dimensional strings from which both matter, time and space emerge (Susskind, 2006).

But one of the fundamental questions that has been raised since the theory’s inception, by one of its founders no less, the Hungarian American mathematician John von Neumann, is the role that the observer himself plays in the result of the Quantum experiment, in the process of “measurement” as it is typically referred to as (Von Neumann, 1932). This integral role of the observer has been more generally applied to the role of mind, or consciousness, through which many physicists, and other philosophers of science, have hypothesized as the source of the very odd and strange mathematical construct called *wavefunction collapse* which is what happens, mechanically and mathematically speaking, once an act of measurement is made by an observer (of a quantum system). In this interpretation of quantum theory, the variant that is attributed to Von Neumann, Wigner, Stapp and others (Wigner, 1963), it is consciousness (or *mind* as we envision it herein) that is the cause of the so-called *measurement problem*, which in turn causes the so-called wavefunction collapse that so defines explanation from a classical mechanical point of view as put forward by the theoretical frameworks advanced by both Newton and Einstein (see (Atmanspacher, 2020; Stapp, 2001, 2009; Thaheld, 2005; Valdez, 2019)).

This interpretation of course sits in stark contrast in fact to the classical, orthodox interpretation put forward by Heisenberg and Bohr, two of the founding fathers of Quantum Mechanics (the so-called Copenhagen Interpretation), which asserts that no metaphysical conclusions should be drawn at all from the mathematical formulation of Quantum Mechanics, it’s just a calculating discipline to predict the outcomes, at least stochastically (probabilistically) of experiments conducted at the Planck scale. Much has been written about this, and we will not attempt to summarize the findings here necessarily, but what we will point out though is that in order to reconcile some of the basic paradoxical conclusions of quantum mechanics and classical mechanics (e.g. around *wave-particle duality*, *uncertainty* and *non-locality*) one must look for higher order intellectual paradigms, just as Einstein advises us in fact with the sage advice which I paraphrase

here, *no problem can be solved using the same intellectual paradigm through which the problem was created in the first place.*

The general approach within the physicist, and mathematical community has been, not surprisingly, to search for more advanced and abstract mathematical constructs that can explain how it is that both Classical Mechanics (Relativity in its post Einsteinian form) and Quantum Mechanics can both in fact be true, as we believe them both to be given their predictive and explanatory power that has been proven time and time again empirically. But we are still left with the question about what it is that this math is actually telling us, what does it actually mean? Invariably this gets into the interpretive domain which in turn leads us into philosophical waters (philosophy of science, epistemology, metaphysics, ontology, etc.). And while some very interesting developments have been made in this area, on the philosophical side of the house so to speak, much of the underlying connection to mathematical, geometric and algebraic rigor has been lost. This is not true in all cases, but certainly from a philosophical perspective it's fair to say that mathematical rigor is somewhat lacking. It is in this intellectual gap so to speak, that we offer up this work as a (potential) solution to some of the problems that arise from the paradoxes that emerge from Quantum Mechanics as they relate to Classical Mechanics, again as put forward by Newton and Einstein and others.

To this end, we lean on the work of many academics and scientists that have explored various ways to integrate consciousness, again the mind, into physics like the aforementioned Von Neumann, Wigner, and Stapp but also others such as Pradhan (Pradhan, 2012), Manousakis (Manousakis, 2006) and Blaha (Blaha, 2009), all of which who have looked at various ways to interpret the underlying mathematics itself to reveal how it is that consciousness, or again the conscious mind, can be understood as “operating” within the paradigm itself to cause this phenomena of *wavefunction collapse*. Our work here is intended to build on said work and expend it, in particular within the context of both the Western and Eastern philosophical tradition, such that a more complete understanding of its meaning, epistemologically, can at least be approached.

Fundamentally then, Quantum Mechanics presents us with the question of epistemology, i.e. how it is we are to conceive of knowledge generally speaking and how it is that we can understand our (subjective) experience of the (objective) world, the world of Nature and the world of Physics as it is typically understood. Ultimately the question seems to boil down to the question of whether or not we participate in the creation of our reality, and if so how and to what extent? Given that we know that matter is really another form of energy, what is it that really matters anyway?

2. Ideological Reference Architecture (IRA)

As we delve into metaphysics, as the categorization of models, potential solutions really, to this quagmire of interconnectivity between mind and matter, we

are confronted with this notion of interdimensional realms of being, where the physical world sort of stands out from the mental world but that in certain situations, certain (altered) states of mind for example, this internal world not only appears, or seems for all intents and purposes, real, it is described in many cases as more real than the world of physical reality that we experience “consciously”.²

This data, which is subjective by nature in that it does not lend itself to physical description necessarily (although physical attributes can be associated with such states like brain wave frequency, neurological activity, heart rate, etc.), we have arguably reached a place in our intellectual development where these altered states, which can be induced by a variety of means (spiritual practices such as meditation and chanting, so-called Near-Death experiences, DMT or ayahuasca induced altered states, etc.) simply can no longer be ignored if we are trying to understand not just the full scope of human experience but also the true nature of reality.

Whatever model we come up with to understand the world, these experiences, their reality and their impact, must be explainable in some way. These aspects of reality are part of the natural world, and it is the study of the natural world that was supposed to be the scope of physics to begin with, as put forth at least by Aristotle with his designation of the same *as natural philosophy* (Aristotle, *Physics* (Valdez, 2019)). It is the understanding of Nature that we are after here and all sorts of academic disciplines now from Physics itself to Psychology, Cognitive Science, Biology and certainly Philosophy all seem to be telling us that if we are to understand the world of nature, comprehensively at least, then we must in fact consider the role that we have, as cognitive and sentient beings within Nature, who have arisen out of Nature, in both its creation as well as its understanding, through experience.

Natural philosophy most certainly as originally conceived, by Aristotle at least, assumed the same, with the study of psychology (the animus or Soul) being an integral part of the study natural philosophy itself, from which we ultimately derive Science and of course Physics. In fact, the definition of physics itself is rooted in this idea of Nature, as we see from the Oxford English language dictionary:

Late 15th century (denoting natural science in general, especially the Aristotelian system): plural of obsolete physic “physical (thing)”, suggested by Latin physica, Greek phusika “natural things” from phusis “nature”.

Physics then, historically, is rooted in Aristotelian natural philosophy, or the study of Nature which included not just what we call Physics today but also biology and psychology (and astronomy and geology).³ While our Western, reduc-

²See for example a summary of the Near-Death Experience literature and various neuro-scientific explanations thereof in Facco & Agrillo (2012), for a general description of the use of ayahuasca and altered states see (Shanon, 2003). For a psychological and neurological mapping between Near-Death experiences and DMT induced altered states see (Timmermann et al., 2018).

³Aristotle’s other main branches of philosophy outside of natural philosophy were speculative, or first philosophy (metaphysics, epistemology, etc.), and then practical philosophy which included ethics, political science, economics, rhetoric and the arts.

tionist approach to intellectual development has led to some amazingly powerful discoveries no doubt, it nonetheless at the same time is has reached a sort of intellectual wall of sorts, where some sort of basic, fundamental revision (or expansion) seems necessary to make sense of the incompatibilities that are arising between and among the various scientific disciplines.

This is nowhere more prevalent than in Physics itself somewhat ironically. While the measurement of the spin of an electron or photon from a host of super-positional states has its applications no doubt, at some level we must at least make an attempt to understand what this state of affairs, as it has been experimentally verified over and over again, tells us about the nature of the world that we live in, and perhaps more importantly our place in it. This is at least at some level what we attempt to do in this work.

This leads us invariably into the relationship between mind and matter, an area where much progress has been made in the last few decades but where regardless gaps remain and a holistic model of how these two worlds meet and interact, that is both intelligible and explanatory and leverages developments in cognitive science, psychology, philosophy and computer science remains. We look to close that gap somewhat at least here by looking quite specifically how it is that a thought, an idea or a concept, actually becomes reality, or more specifically how it is that physical reality comes to be shaped by our minds. A better understanding, a clearer understanding, of the relationship between the mental world and the physical world has applications across a host of domains, perhaps the most practical of which is psychology, although technically the topic at hand is one of metaphysics.

We look to develop a system to describe the relationship between mind and matter, thought and matter (form and substance), in terms of the physical manifestation of *ideas*, or *concepts* as they are described in the cognitive science literature mostly. This system we look to describe we consider in the domain of metaphysics because the concepts described herein exist both above and before from an abstraction point of view, physics proper. They are rooted both in the mind (thought) and the physical world (physics) but at the same time, as a system, exist as a higher order set of relations between the two, hence the term metaphysics.⁴

In this sense one can consider the system we describe as a sort of metatheory that describes how these two domains interact with each other, defining their connecting principles and the behavior that governs the existence, weight and forces that make up said system. We distinguish our work from physicalist approaches generally, where physicalist in this sense indicates the ontological supremacy of the measurement of physical phenomena (mass, energy, weight, force, velocity, etc.). We are not looking to describe physical phenomena, even though we may refer and/or connect to various physical models (classical mechanics, quantum mechanics, relativity, etc.) as we describe what we call here as

⁴We follow Bohm in this regard (Bohm, 1980).

Ideological Mechanics, as distinguished from ideological.

We do not look to supplant or revise topics of neuroscience or theoretical physics here (or any interpretations thereof) but to describe a higher order system at work which bridges mind and matter generally, what could be called (using Aristotelian terminology) the *actualization* of intellectual *potential*. It is something every individual is familiar with, leverages every day for all sorts of tasks, and is the primary system that governs any sort of human behavior. Understanding the mechanics by which this occurs, this actualization, is a critical component for success in the fulfillment of ideas, desires, wishes, or anything else an individual is looking to manifest in their lives or in society in general.

The system we are describing consists primarily of thoughts, or more specifically the concept of an *idea*, or again *concept*⁵, which we define herein as a set of properties, attributes, or relations to one or more (a set of) objective phenomena that is understood by us as individual cognitive entities. In this sense, our term *idea* can be said to correspond to Plato's notion of *form*, except we broaden the concept here to include not just the notion of form but the notion of a set of forms that have relations to each other.

Generally, we follow a Kantian metaphysical structure, although we adapt it to conform to modern software engineering techniques (i.e., theoretical information processing systems, or Turing Machines essentially), and we couch it in Cartesian language so that we can consider the world as it truly is (noumenal world), as it relates to the world as it appears to be (phenomenal world).⁶ More explicitly we expand upon Platonic forms to create what we shall call an intellectual space (which we shall define geometrically) which is populated, or supports what we shall call, following Kantian metaphysics more or less, *transcendental objective space*. In this space there exist forms, transcendental objects, sets of which, along with their relations, constitute this notion of an I(dea). Ideas, transcendental objects, have their existence in what we shall call Intellectual space, or more specifically virtual reality, what we call *res virtualis* in our model which denotes its existence as a dimension of reality, but also the ethereal nature of the concepts, the ideas, that exist in this reality.

This reality is independent of the physical form (what we refer to throughout as an embodied, cognitive and sentient being), and represents a sort of shared construct that is inherited by each individual cognitive and sentient being in said culture, society or intellectual framework. In a sense, one's social, linguistic and really intellectual context is really established, defined in a way, by *res virtualis* (Figure 1).

This virtual world is distinct, metaphysically from what we are calling the

⁵We use the terms *idea* and *concept* interchangeably for the most part throughout, unless we state specifically that we are making a distinction. The definitions, algebraically, are laid out in the Model section of this work.

⁶We cover the philosophical context of the metaphysical architecture we propose in detail here, rooting it in both Western (Plato, Kant, Descartes, Bohm) and Eastern (primarily the *I Ching*) metaphysics as a natural extension to the work this author has done elsewhere (Valdez, 2019, 2022a, 2022b).

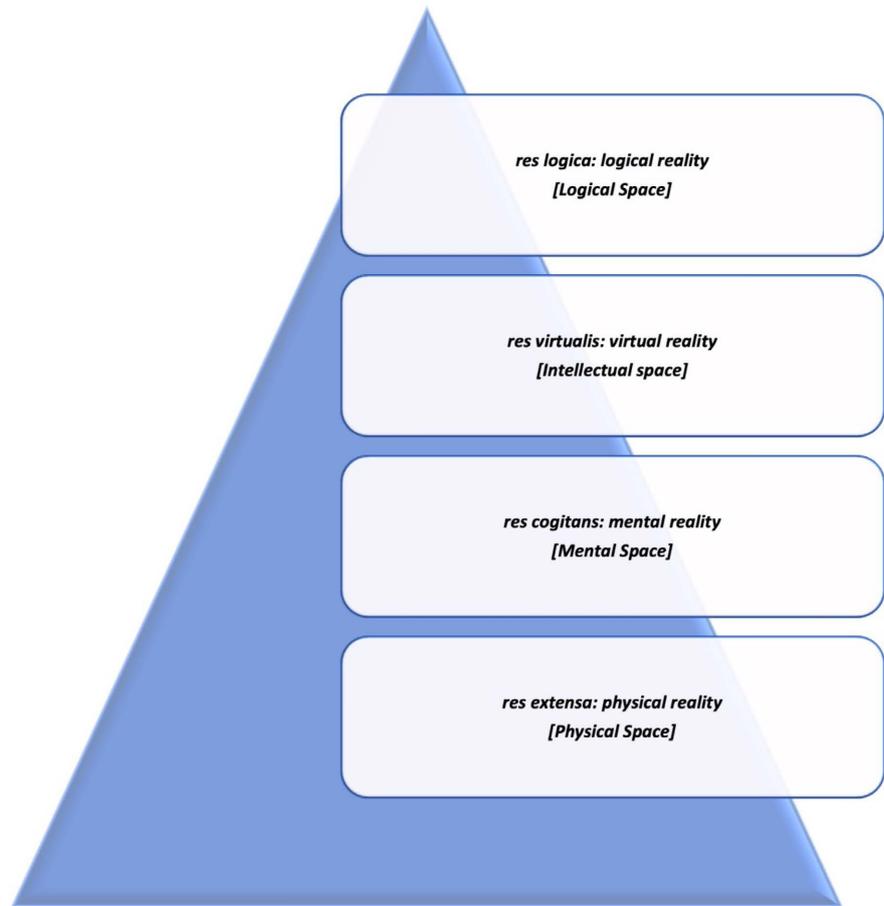


Figure 1. Ideological metaphysical architecture (res landscape).

cognitive world, *res cogitans* (following Descartes) which is the space wherein thoughts occur, happen, pass through and the place where these thoughts are contextualized in a specific cognitive, sentient being, i.e. in their *minds*, a term we use here to describe the domain within which this cognitive process takes place. The cognitive space then, is also distinguished from the intellectual space, but also the physical space which is defined, again following Descartes, as *res extensa*.

Each of these domains we describe in its own spatial geometry, leveraging quantum measurement theory (and adaptations of quantum mechanical mathematics) to describe the means by which information is passed between each of the metaphysical layers, where an idea is transformed into a concept and a concept is in turn transformed into action.⁷ You can think of each layer as separated by an abstract information processing interface where the stuff of the ontologically prior layer is interpreted, contextualized and transformed into the more gross layers. In this way the model is interdimensional, in that it recognizes and accepts the “reality” of each of the dimensions as well as generally follows

⁷Both (Blaha, 2009) and (Manousakis, 2006) were at some level foundational works for this type of approach, although we solve for a much broader problem and deviate from their models significantly, their work nonetheless provides a sort of algebraic and mathematical backdrop for our model.

the metaphysical conception of Yoga and Vedanta that conceives of reality as having as being interdimensional from the most gross, and dense layers (physical reality) to the more subtle and abstract layers (dream, altered states, *samādhi*, etc.) (Adiswaranada, 2003, 2006; Vireswarananda, 2008; Bryant, 2009; Valdez, 2019).

This information processing (and transformation) based model lends itself quite elegantly to the map of a software application framework in that it follows the same basic engineering principles of abstraction, with clean interface layers where raw data is processed, ingested, transformed and contextualized such that it, the information, can be manifest on said layer. In this context we see the following type of analogy that can be drawn with our metaphysical architecture (Figure 2).

In this analogy we conceive of *res logica* as not just Kant's a priori cognition space, but as the basic structure that governs how it is that concepts, and their physical as well as intellectual counterparts, can be constructed in said universe as it relates to the specific structure (physical and mental) of the cognitive, sentient being in question. This is what we call the system bios and all subsequent layers depend on it, and inherit its structure and laws. *Res virtualis* then can be conceived of as the operating system software, the basic structure which governs,

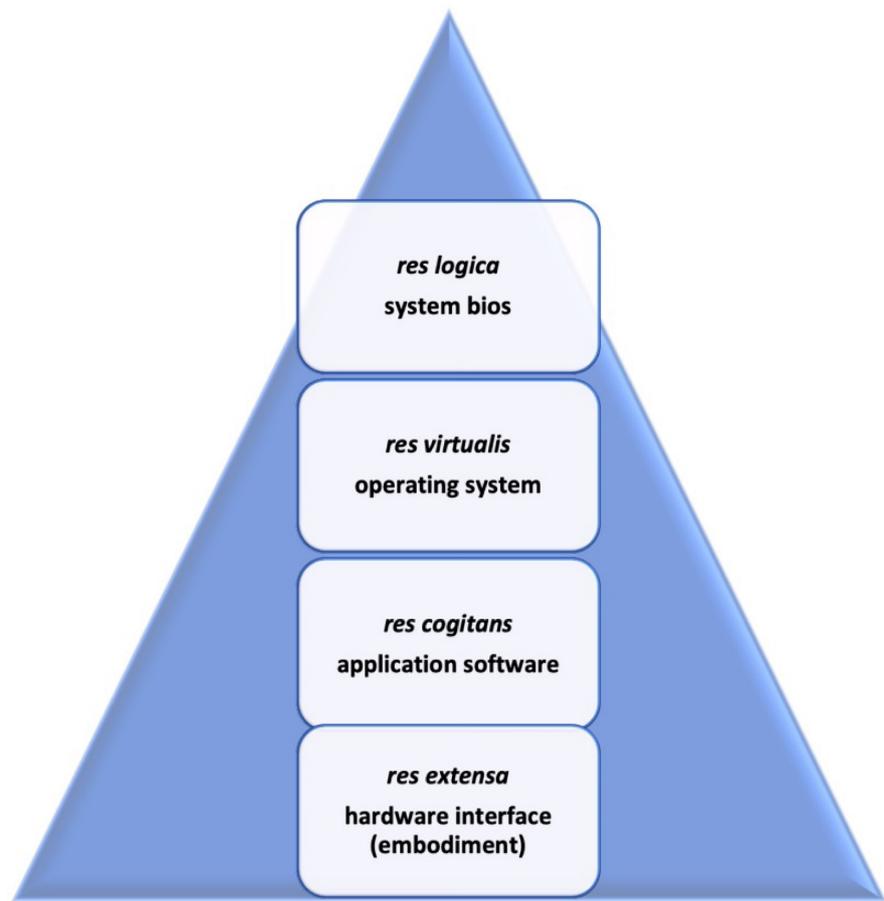


Figure 2. Metaphysical architecture and software engineering.

and provides the storage mechanism and relationships, for all possible ideas in that particular universe for that particular type of being. This is a static concept, is structural primarily, and is tied to both *res logica*, the bios software, and in turn provides the structure for the mental space that is defined in *res cogitans*. Note that *res virtualis*, virtual reality, includes sociological and cultural factors which are shared across cognitive, sentient entities, our Jungian collective unconscious or storehouse of archetypes (Jung, 1981) what we have called *mythos* elsewhere (Valdez, 2019).

Res cogitans then becomes the run time version of said virtual reality, which contains the memory and experience of that particular cognitive, sentient being. This is representative of our cognitive Turing Machine which we define below. This more or less maps to Kant's notion of the world as it appears, i.e. the noumenal world, as distinct from the world as it truly is, what we are calling *res extensa*, or the physical world.

While the model isn't a perfect mapping, given the differences in domains, it is generally sufficient for our purposes metaphorically speaking and gives us a sense as to the overall structure of the metaphysical system we are describing as well as gives us the opportunity to ground the study in basic information processing and software engineering practices, engineering disciplines that are well understood at this point and have a solid grounding in engineering generally.

3. Ideological Space⁸

With respect to defining the notion of an *idea* (*i*) within the context of our ideological mechanics, we start with the very basic premise that what we are describing is reflective of a certain aspect of a complex system, not a physical system necessarily, but an ideological one, an intellectual one, that has a very close correlation to the physical world even though from a modeling perspective, within the context of our ideological metaphysics defined herein, it is distinct from a physical system.

We use this word because it sits at the very heart of the Western philosophical tradition, put forward by Plato as *eidos*, or types, upon which his theory of forms is based upon which sits his whole system of metaphysics more or less. This is the central thread of the western idealistic tradition, which sits in direct contrast to its materialistic cousin whose position was taken up by Aristotle more or less with his notion of substantial form. It is within this context that we land on *idea* as the basic building block of our system, in a way analogous to where the atom sits on the materialistic side.

Part of what we are exploring here, our intentions if you will of defining an algebraic formulation of ideas and a corresponding geometrical structure within which they can be said to reside, exist as it were from a metaphysical perspective, is the rules, laws and principles which govern the relationship between an *idea*

⁸*Ideological* as opposed to ideological system, we work with *ideas* as defined specifically herein and not ideas, or concepts, generally.

and its actualized, physical counterpart, a physical *state of affairs* using behavioral economic parlance, and actualized instances of an ideological system structure using our ideological mechanical parlance.

But to identify these relations, to establish some sort of algebraic relations between an ideological system state, and a physical system state, we must have a defined algebraic and geometrical structure as an ideological starting point. From here we can establish how these ideas evolve in time, how time in the (geometrical and algebraic abstraction of the) ideological realm differs from time in the (geometrical and algebraic abstraction of the) physical realm (if at all) and how ideas correlate to their physical system state counterparts.

Epistemologically speaking, some sort of conceptual structure is necessary for both the definition of any physical state (an object or set of objects and their respective properties, relations and functions) and the understanding of any physical state, this much seems clear. But we are not just talking about structure here, we are talking about ideas as beings in and of themselves, which have a certain metaphysical reality, i.e., they are alive in some sense. We reach this conclusion because we start with the notion that *ideas* in and of themselves represent the highest order construct of our metaphysics, this is our ideological ontological premise you could say. We take this position to investigate, from a research and analytical perspective, what types of solutions it may provide, if any, to the mind and matter problem, suggesting that there is a higher order reality, an implicate order (Bohm, 1980) from which both the physical world and the mental world unfold from as respective explicate orders from the ideological ontological implicate order.

Our *idea* is not a physical system however, it is an intellectual one. It doesn't have physical properties (it may correlate to various physical states but more on that later) but it does have conceptual ones. So while from a definitional perspective we adopt an Object Oriented Programming (OOP) language design (and its serial abstractions in SQL database systems) as the best representative of the notion of an *idea* in our model, effectively a (theoretical) object state at run time, this idea in our model does not have actual physical attributes, just conceptual ones.

From a theoretical Computer Science perspective, in order to support such an ideological structure, we would need a computing device (Turing Machine) that had access to infinite storage and infinite processing power to both store and process all possible universal system configurations, even in their ideological abstraction, since the beginning of time (the Big Bang as $t = 0$). Thankfully we do not need to build such a machine since we are simply defining the metaphysical properties of such an ideological system that, at least at this time, need not have an actual physical computing system counterpart.

Although it could be argued that the universe itself represents such a device, as information is embedded and encapsulated within it, as not just organic DNA based life forms that are capable of both individual, and now via language and other storage devices (like books and now computers and the Cloud which have

the capability to store massive amounts of information in almost virtual reality based forms, video and audio elements at least), cultural and historical memory storage that span vast expanses of time. This is a somewhat radical epistemic position but from this vantage point, the vantage point of information, or again knowledge, as primary, the universe itself can be conceived of as a massive, cosmically scaled, knowledge acquisition and storage system of sorts. We, as individual elements of said system, represent sort of atomic components of the larger whole, connected at some level through deep elements of the psyche that include both a collective (Jung) and a cosmic (mysticism) aspect. In this sense we are created in the same image of our universal counterpart, as a subsystem within a larger whole. With IRA we describe the process individually but the process itself is scale invariant, which is one of the elegant aspects of knowledge based metaphysical architecture.

What we are describing here is a specific instance of a Turing Machine (which of course computer systems generally are) that is designed such that it can support all possible system configuration states of the known universe throughout all moments in time in said universe, from an ideological perspective of course, via representations of physical configurations (following Kant). We distinguish, in Aristotelian terms, between a *potential* system state which we define within the bounds of our ideological algebra and corresponding geometrical space (and rules of movement through said space which we detail below), and an *actual* configuration of said system state in the physical universe, an instance of the ideological object as opposed to just a virtual, or transcendent, version of said system state existing in idealogical space alone.⁹

From a metaphysical perspective, we are rooting our terminology in Platonic metaphysics (forms), to for example explain the notion of redness in our idealogical space as *representing* not an *actual* instance of a red object in physical space (which has its own system configuration topology in its own “space”, *res extensa*) but the very idea of redness itself which resides in a sort of virtual, transcendental space (*res virtualis*) where the property itself exists in a way. This distinction, the transcendental red if you will, then has the capability to be used as a mental construct associated with a given mental representation of an object, say a car, that we conceive of as being red in our minds, what we are referring to as mental, or cognitive space (*res cogitans*).

As a further illustration, in this intellectual or idealogical spatial configuration redness is an attribute that could associated with any Object that contains the property of Color, which represents an instance of that object in actualized physical space as in fact red, but is a mental representation of the same. In this context we are suggesting that an *actual* object in idealogical space corresponds to a potential object in virtual or transcendental space, and that ideas, in their

⁹Our version of the Turing Machine not only has infinite storage and processing power, but it also has been configured with the latest in Operating System, Compiler, and Database Management software such that it can represent these *ideas* as entities, or *objects*, (*O*), and their respective *properties* (*P*), *functions* (*F*), and *relations* (*R*) directly.

actual form as distinct from their potential form in again virtual or transcendent ideological space, are more or less Platonic forms (or sets of forms and their relations you could say which arguably forms in their philosophical conception imply anyhow).

For example, we take the notion of redness which underpins, in Platonic epistemology, all red objects. We know what redness is, and it is this notion of redness, as the form of red, that we refer to as the property, or attribute, of red of a given object in a given ideological system state denoted by i.e. if a specific idea contains an object with a color property, and its attribute red is set to true, then in fact we have an instance of red that has been actualized in ideological space. You can consider the container, or the bit in this case which can be either 0 or 1, as representative of redness in transcendental or virtual ideological space. It's in a sort of superposition state where we know the color property exists, but it is, at least ideologically speaking, as yet undefined.

We further expand this ideological conceptual space (and its virtual/transcendental counterpart) along Platonic epistemological lines by assuming that 1) All physical things, objects or beings must have a corresponding ideological counterpart which underpins their existence (Platonic forms); 2) Actualized ideas in ideological space have potential (structural) counterparts which define their relations, functions and possible configurations; 3) The space of all possible ideas that could potentially exist in this ideological space as theoretical ideological system states or configurations.

Knowledge in this sense, following Plato is more of a “remembering” rather than a “discovery” necessarily¹⁰, using orthodox Platonic epistemological parlance, but we take this epistemological position one step further and suggest that all possible ideas, all possible states of affairs, or *states of mind* as we call them, already have a transcendental existence and as such a given *idea*, a given system state, is sort of selected from this infinite possibility of ideas, its evolution over time not necessarily being representative of ideological state configuration changes, but the selection of a different idea from the set of all potential ideas in that universal configuration space.

With IRA, we conceive of what we might refer to as this *universal ideological space*, or the set of all possible ideas in a given universe, as shared by the collective species (or potentially sets of species depending upon the level of ideological abstraction we are dealing with) in question, a set of ideas that are governed by the rules of the society of said individual sentient agents or beings (*res virtualis*) as well bound by the physical rules of the universe within which said beings, or agents, experience reality (*res logica*), but nonetheless the individual for all intents and purposes can be said to have access to its own ideological system configuration space (*res cogitans*) which is fundamentally dependent upon, and yet

¹⁰This epistemological position offered by Plato that all humans possess a sort of innate, complete knowledge and that learning is a sort of rediscovery is referred to as *anamnesis*, or *ἀνάμνησις* in the Greek, a theory he develops in the *Meno* and *Phaedo* dialogues (and to a lesser extent the *Phaedrus*). See (Silverman, 2014) for a detailed account of the same.

distinct from (ideologically), the specific universal ideological framework and system in question. The difference is, following Aristotle's notion of *substantial form* (Marc & Reeve, 2021), one of form versus substance, except we are dealing with ideas rather than things or objects here and so the *form* of the ideological space is governed by the universe in question while the *substance* is determined by the individual's cognitive structure, the substance being the individual *mindstuff* in this case.¹¹

Note this notion of a transcendent or virtual (potential) idea and its status as a potential, abstract object (virtual object in OOP) versus an actualized idea in ideological space (an instance of said object at run time in an OO designed system) correlates to the notion of social definitions of ideas that are implicit to the language and society within which they exist, ideas as ideas in and of themselves let's say, as understood in contrast to instances of actual ideas (vs their theoretical counterparts) which can be said to exist transcendentally in this ideological space. This is (one of the reasons) why we have a distinction between *res virtualis* (transcendental or virtual ideological space) and *res cogitans* (mental, or cognitive ideological space) in our metaphysical architecture. We also distinguish these two metaphysical realities if we may call them that, from ideas which are instantiated in physical, empirical reality, i.e. *res extensa* which roughly correspond to this fairly broad notion of "state of affairs" which again is used in in some statistical, predictive models in behavioral economics.

From this vantage point, each one of these (hierarchically structured) ideological "spaces" represents a further abstracted ideological structure of the layer underneath it. Furthermore in our universe as we conceive of it, as an ideological structure, i.e. what we mean when we say *ideological ontology*, rests on the notion that all possible universal states of being, i.e. the set of all possible ideas that could exist for all points in time for said universe, using a sort of radical Platonic epistemological (theoretical) metaphysical configuration, are in some sense accessible (as a type of remembrance again) to all beings that have access to this ideological space, i.e. all thinking, sentient beings in that universe.

In other words, Plato's form of forms, or the Good (*Timeaus*), would correspond roughly to an *idea* in logical space (*res logica*), where there are defined therein the core, logical and rational foundational relationships and boundaries, core archetypical constructs, for the defined universe that can be described in our four-dimensional reality/spatial configuration. In this logical space (*res logica*), the foundational rules and relationships that govern both the structure and boundary conditions of *ideas* in and of themselves in that particular ideological universe are defined, typically expressed in mathematical, geometrical and algebraic language (as we see manifest in the laws of physics for example). These core constructs that are defined in logical ideological space then (*res logica*), govern the rules of the universe across all dimensions effectively, establishing the basic laws and constraints upon the possible transcendental or virtual space (*res*

¹¹The notion of the Universal Mind is explored in the unabridged form of this paper, i.e. *Big IRA*.

virtualis), where the base metaphysical (potential) objects and their relations are established, as derived from the idealogical space defined in *res logica*.

This transcendental reality, this virtual idealogical structure (again *res virtualis*) is accessed by, underpins the thought processes of, all sentient and cognitive capable beings in that universe. This transcendental universal reality then is leveraged to organize the respective mental, or cognitive (*res cogitans*), idealogical reality for that specific cognitive being in that specific universe. And then finally, this cognitive idealogical structure is then in turn leveraged to both interact with and understand, make sense of, physical reality (*res extensa*). So in this sense our model is *multi-dimensional*, or *inter-dimensional*, although we use a fixed set of dimensions (specifically four dimensions: *res logica*, *res virtualis*, *res cogitans* and *res extensa*), and as such lends itself to a psychological interpretation where various states of consciousness (waking state, dream state, deep sleep, unity consciousness for example) can be understood as states of being within and among the various idealogical spaces.

It's a subtle distinction we're making here between these layers of idealogical space, but the distinction is important as it 1) More or less follows Platonic form theory; 2) Is constructed out of Cartesian dualism (mind and body); 3) Leverages Kantian metaphysics; 4) Lends itself toward a modern object oriented deign pattern of conception where the most abstracts, properties of objects themselves, are defined in the system core (*res logica*) and less abstract, more concrete, objects inherit from their intellectual predecessors but include additional properties and functions upon which an entire intellectual reality can be constructed. This allows for a model that is both fully integrated into the very heart of Western philosophy, on the idealistic side of course, and at the same time allows for a relatively straightforward translation into modern computing terminology (theoretical Computer Science), which we then in turn can look at with respect to core Chinese philosophy which shares with Computer Science its basic binary structure, yin-yang/0-1.

4. Ideafication, Potentiation & Actualization

We will now try to develop further on this notion of the state of mind (*res cogitans*), and its relationship to the state of the world (*res extensa*) on the basis of quantum measurement theory (event probability distributions) in order to better understand the relationship between the two in our idealogical conception of the universe, our epistemic ontology. To do so we define a mathematical formulation of the state of mind, which includes within it a (representative) state of the world, a quantum mechanical formulation.

For mathematical simplicity we consider a two-state system like the happening or non-happening of an event in an individual's reality. The classical probability of the happening of the event in reality is considered as "*x*" and the probability of happening of the event in the state of mind of the person as assumed by the mind is taken as "*y*". We will calculate the overlap probability that the mind

state overwrites on the state of the world and thus find a mathematical method to study the role of mind in the ordering of the events in life.

While we do not suggest that this is necessarily “the” way that the state of the world and the state of the mind are correlated, we do suggest that at least epistemically speaking, this is a way, using quantum measurement theory, to conceive of how (at least one way how) it is that they are related to each other.

In Kantian terms, the world as it appears to us (the state of the world in the state of the mind), is essentially what we are working with metaphysically speaking, and as such understanding how it is that the two (if do indeed conceive of them as separate from each other which in our model at least, with respect to *res cogitans* and *res extensa* respectively, we do) relate to each other may perhaps lead to some interesting insights.

We define the states of the world as orthogonal vectors of a general Hilbert Space (H). General elements of the Hilbert space represent possible potential states of the world because they encode all kinds of information about the orthonormal basis states. These states cannot be directly observed or revealed but we can observe in general states the probabilities of the basis states. The probability distributions over basis states can be obtained by projections of the general state onto the basis states.

So with respect to the state of the world, again H , we have a finite dimensional Hilbert space $H := C^\Omega$ spanned by a complete orthonormal set of basis states $\Psi_\omega := |\omega\rangle \in H$. The general states of the world are linear combinations of these basis states:

$$|\beta\rangle = \sum_{\omega=1}^{\Omega} \beta_\omega \Psi_\omega \in H$$

Each state of the world (Ψ_ω) contains several complex amplitudes. Projectors of the composite state on basis states $P_\omega := |\omega\rangle\langle\omega|$ give the probability of finding the basis state ω in the complex state $|\beta\rangle$. The complex coefficients of a state $|\beta\rangle$ contain more information than probabilities over outcomes, which would be the case using classical probability.

The state of mind are elements of the Hilbert space H_M which represent subjective information about the physical world and the attitude of the person towards such information, as it relates to that specific cognitive being’s set of experiences (*res cogitans*), dictated by the idealogical (shared and collective) state of said universe (*res virtualis*), which inherits the universe’s basic physical and intellectual properties (*res logica*). This information in toto represents a sort of situational context, all experience leads to the point of a specific state of mind which reflects (an individual’s knowledge of) a specific state of the world in relation to said state of mind (**Figure 3**).

In this sense, it can be understood that the state of mind, as encapsulated by the embodied being within which it resides, provides the metaphysical reality, the mental or idealogical reality, within which the potential states of the world are “actualized”, through action which is an actual physical interaction with the world which changes its state somehow. From a quantum measurement theory

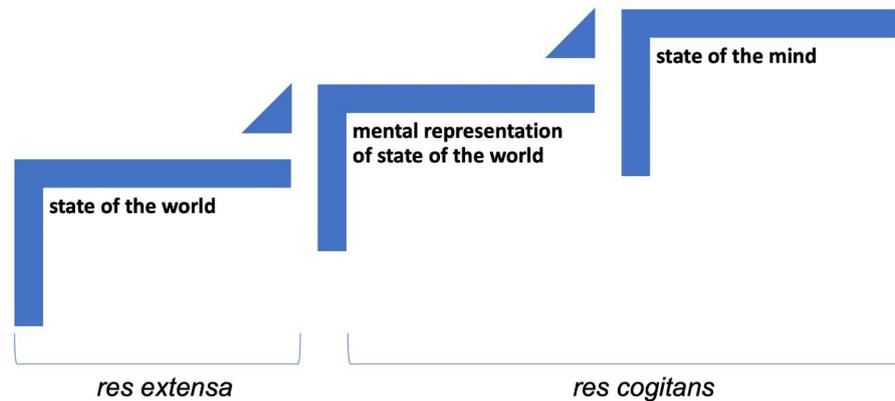


Figure 3. Mind state as a function of world state.

perspective, this interaction is conceived of as a collapse of the potential (superposition) state of the world into an actual state of the world. We conceive of this action epistemologically (following (Blaha, 2009)) in the sense that our interaction with it reveals some information about it as well as changes its state. The acquisition of knowledge from this process can be understood as an artifact of the action, again akin to measurement of a system in quantum mechanics.

In quantum mathematical terms (quantum measurement terms really) the state of the mind which provides the epistemic baseline (i.e. state configuration itself which includes again a state of the world representation) for the action in question, is represented as a wave function that in a corresponding ideological Hilbert space (*res cogitans*). The wave function representing the state of mind (Ψ_M) has complex amplitudes that interact with the state of world wave function, and as such the projection of the state of mind on the state of the world can be understood using quantum measurement theory.

In this formulation, the outcome of an epistemological measurement, or an action or act, a process which we call *actualization*, would be represented mathematically by a collapse of the (potential and superposed) state of the world (Ψ_w) in its corresponding spatial geometry (Hilbert space), which is reflective of an overall state of the world change in *res extensa* itself, a map of which exists in the correspondent states of mind that interact with said space.

In order to assess the information about the basis possibility states $|w\rangle$ describing an arbitrary potential state of the world, which is represented as a superposition state (of the world) relative to some defined (collapsed) state of the mind, we can evaluate the probability of an expected outcome of the materialization process, as a function of the product of the projection operators for the state of the mind P_M , the state of the world P_w , and the state of the world in the state of the mind $P_M P_w P_M$.

To clarify the above (quantum mathematical) formalism, the projection operators (P) are the measurement operators that measure the probability of a certain state in the superposition state. When we apply the projection operator particular to a state, then the operation will collapse the superposed state into the

particular state with the measured value as the probability of that state. In this case there are a product of these projection operators which is measuring the probability of the basis state of the world (*res extensa*) as it relates to the given state of mind (*res cogitans*). Here the amplitude of the operation of the three projection operators is giving us the information about how much value the mind is giving to the particular basis state of the world.

This collapse state, the result of action which we again conceive of as an epistemic measurement event of sorts, occurs when an action is undertaken, no matter how small, which in turn reveals something about the physical environment within which said action has taken place. Again we call this process, following Aristotelian terminology, *actualization*, as juxtaposed with the process of *potentiation* which is the process by which ideas in and of themselves are contextualized and fleshed out in the mind (sourced from collective and/or universal mind or some combination thereof (see **Figure 4** below).

Ideologically then, i.e. in our idealogical ontology (idealogical mechanical) description, this process of action is conceived, much the same way as it is in Quantum Mechanics in fact, following von-Neumann, Wigner and Stapp, as mind (*res cogitans*) interacting with matter so as to “collapse” it into an actual state from a given set of possible states that are a function of its wavefunction in physical space (*res extensa*). In this sense we adopt the von-Neumann-Wigner-Stapp interpretation of the mathematical formalism (which also is reflected in (Manousakis, 2006) interpretation), except we apply an epistemic lens to the process (following (Blaha, 2009) primarily). It’s not classical observation measurements like position, location or momenta that we are after when we interact with the world, but information about the world that is relevant to the state of mind of the individual interacting with it.

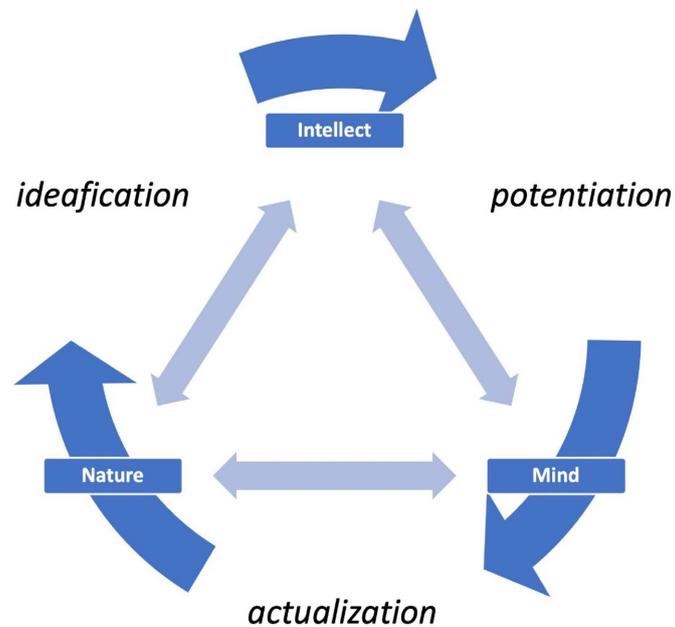


Figure 4. IRA wheel of Karma.

For example, if I am thirsty and want to drink something and there is a cup of water on the table next to me I reach out my hand to pick up the cup of water and drink it, this process can be said to be driven by the desire to quench my thirst and as such all events that occur between my body and the world around me to satisfy said need are contextualized with this in mind. The actual physical location and momentum, or even weight or any other measurable property tied to the glass or the table it rests on, is only relevant as it relates to its being picked up and its contents being poured into my mouth. In this sense it is the mathematical formulation of the process (Quantum Measurement Theory) that predominates the model if we are to understand it within the context of the meaning within which it is interacted with. This is what we mean basically when we say “epistemic” interpretation of quantum theory.

The exercise of drinking then, quenching my thirst following the example further, is a mind driven, epistemic operation. Sentient, embodied cognitive beings, even at the single cellular level arguably, operate according to needs and functions that are reflective of that form of life in a specific physical context. In this sense then, we conceive of this quantum epistemic process as primarily mind driven, represented by a specific wavefunction state configuration of said mind in the corresponding mental (*res cogitans*) space which in turn interacts with a corresponding physical (*res extensa*) “spaces”.

This interaction we call an “act”, and mathematically speaking corresponds to, just as in Quantum Mechanics proper, a collapse of the so-called superposition state of the world (as represented by state configuration in physical space or *res extensa*), such that the world can be said to be *actualized* in said state. The only difference with Quantum Mechanics proper here is we are not assuming that a physical apparatus of some kind is necessary to initiate said collapse, we postulate that the collapse into this actualized state is in fact (again following at least in some sense von-Neumann, Wigner and Stapp) a function of the mind (*res cogitans*), interacting with the world (*res extensa*), mediated through the body.

Epistemologically speaking then, which is the only perspective by definition that ascribes meaning to the interaction between mind and matter (meaning beyond measurement of physical properties at least), we conceive of the process of action generally speaking, of mind (*res cogitans*) interacting with its environment (*res extensa*) by means of its body (physically) and filtered through the prism of meaning and idealogy more generally (mentally).

The process of actualization is of course complex and involves a constant feedback loop between mind and matter in order to, using Bohmian terminology, unfold as experience. The epistemic perspective itself however, does call attention to not just the importance of the process and the inherent feedback loop between the world and the mind by which reality is “constructed” so to speak, but it also reveals how it is that our minds shape our reality, an absolutely essential characteristic of the human condition that is of course entirely left out of all physical models of the world.

5. On Desired States & the Wheel of Karma

We now look to define the process by which we experience change the world, the process by which we decide to take some action(s) in the world, and how it is that we evaluate the outcome of said action(s). We start here with the notion of the *state of the world*, conceived of in this context to be both an actual, physical system that exists in physical reality (*res extensa*) to which we have some level of knowledge, or intellectual resolution, concerning. Conceptually this *res extensa* contains all (known) physical systems and their respective states in said universe at said time.

Note that at least some portions of this section were inspired by Eichberger (2018) who provides a quantum mechanical formulation for decision making, or decision theory, using *Subjective Expected Utility* theory (or *Bayesian decision theory*) following Savage (1954), which combines (personal) utility functions and (personal) probability distributions (based upon Bayesian probability theory) in order to construct a mathematical, albeit probabilistic, model for human behavior. Our approach is similar except we focus on the alignment between the current state of the world and a future state of the world (representations thereof) as the impetus for behavior and decision making rather than simply a specific set of decisions that are hypothetically presented to the individual in question and their respective utility (to the individual in question).

We begin by defining *res cogitans* as a specific instance of idealogical space in a given universe, reflecting the experiences, memory, cultural and social context of a given cognitive sentient being who retains at any given time a representation of the current state of the world in their state of mind. We presume, in fact require, that the state of mind (at any given time) *must* include a specific, unique map, really representation (ala Kantian metaphysics) of the state of the world, which sits in relation to, and is in fact in some sense constructed out of (at least cognitively) the cognitive contextual state that is specific to that specific sentient, cognitive being in that universe (memories, sociological context, etc.) at that specific time (Figure 5).

This state of the world representation (in the state of mind) is conceived of in our idealogical mechanics as a set of ideas and their relations effectively, an idealogical structure that is rooted in the need to both understand itself within the context of its environment, and the need to access and analyze such information for various utilitarian and other behavioral needs. Part of the role of intelligence as we define it herein presumes this type of analytic processing (of information) capability.

Furthermore, we establish the notion of an idealogical future, or desired state, that exists in the state of mind (a representation thereof) which we are, by definition, attempting to move toward, or in the parlance of our work *actualize*, bring about from a potential to an actual state (using Aristotelian terminology). This idealogical state, sits in contrast to, in juxtaposition with, our current state, which is mental (*res cogitans*), which we refer to generally as the state of mind,

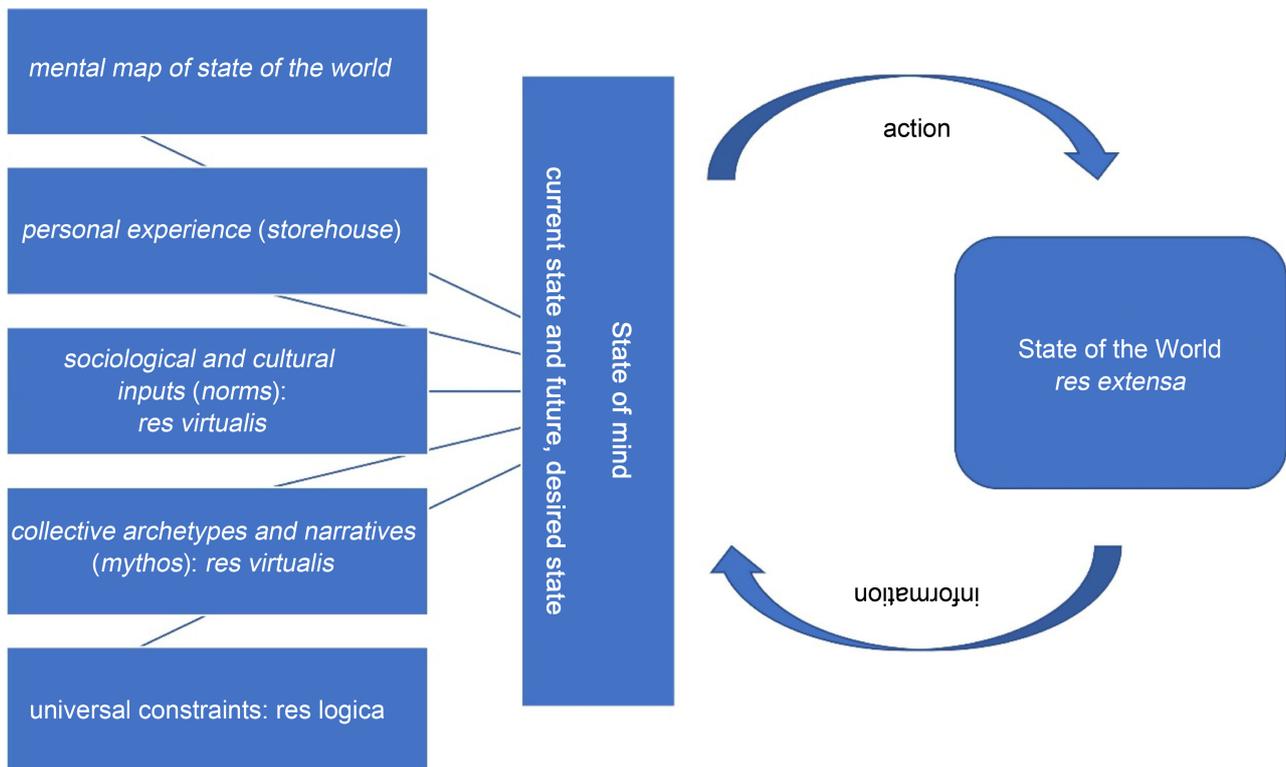


Figure 5. Components of state of mind.

which includes a representation of the current state of the world as well as all of the other components of one’s mental state as outlined in the figure above.

We call the establishment of this ideal state, which is in a continuous state of refinement as new information passes through the system, *ideafication*. This process is distinct from the process of what we are calling *potentiation*, which is the process by which this idea (or any idea more generally) becomes contextualized in a given embodied, sentient being, and as such plants the (mental) seeds by which said idea can (potentially) become realized, through the process of *actualization*, in the so-called material world and/or physical reality. The three-tiered, process based epistemological view is visualized in the diagram below. Note again that the process is, as Bohm conceived of it, continuous and ongoing (**Figure 6**).

But the mind must sort out how to get from the current state to the future, desired state. Given that we understand the world through our own contextual experience, and the experience of the collective as well (res cogitans and res virtualis respectively), and that we have mental maps of the current state of the world in our minds, we then calculate effectively how best we can get from the current state to the future state (more on the factors that go into this calculation below).

The result of this calculation is what we are calling an *action plan*, one that is specific to the individual embodied, cognitive being in question and of course specific to the universe in question that said individual is living in within which he/she wishes to bring about said desired state. This action plan consists of a

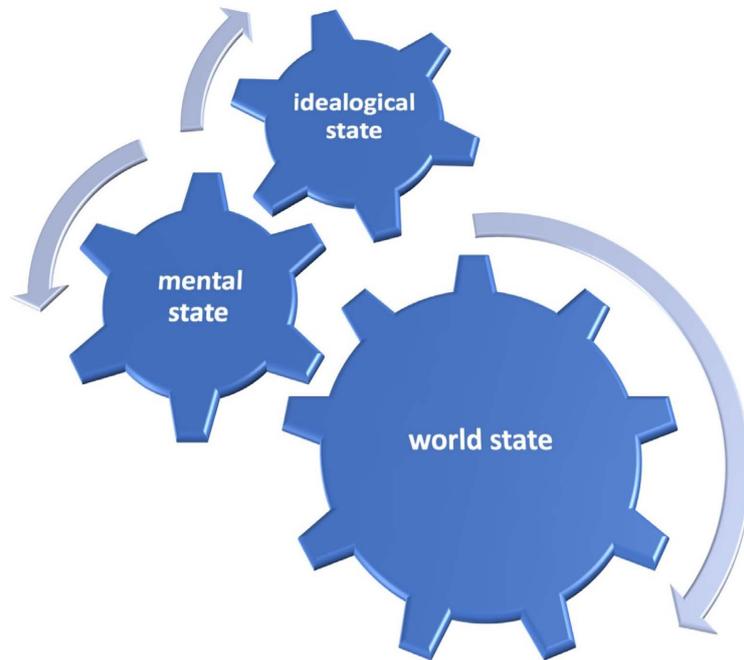


Figure 6. Ideafication, potentiation and actualization.

specific set of acts that are designed specifically to close the proverbial gap between the current state (of mind) and the desired future (ideological) state as efficiently as possible (more on the details of this algorithm are provided below).

This action plan is then implemented, or at least the first act of the action plan is performed (*res cogitans* interfaces with *res extensa*), after which, or through which really, a new state of the world is brought about and evaluated. After this first act is performed, the ideological, desired future state, as well as the action plan to achieve said state, are re-evaluated, and if the individual in question wishes to continue pursuing the desired state, they act again according to this newly formulated action plan and the process continues, recursively, until such time (according to our epistemic model) that the desired state has been realized or the desired state goal (behavioristically) has been abandoned for one reason or another.¹² This recursive process flow is depicted in the figure below.

In this model then, we conceive of a mechanical process by which the state of the world is conceived, epistemologically at least, by means of a sort of transmutation process of what you might call raw ideological potential, into the actualization of said ideas in a given mental context, which in turn is both predicated on, and determines, the material world within which said ideas are conceived. This means of course, and this is perhaps the most distinguishing characteristic of this model versus the standard materialistic and physicalist one, that not only is our understanding of the world a function of our state of mind (and the state of knowledge upon which this state of mind depends), but that also the actual

¹²A desired state may be abandoned for example if it is deemed too much energy expenditure relative to the perceived gain, or if the desired state is evaluated to be no longer achievable for some reason.

state of the world is integrally related to our state of mind. Not just our perception of it, but its content epistemically.

To represent this process of actualization we start with a definition of the *state of mind* as the current, active working set of ideas that are present in the working memory of *res cogitans*, described mathematically as follows:

$$|\Psi_M\rangle = \{|\phi_i\rangle, |\phi_j\rangle, \dots\}$$

This working set of ideas represent ideas in their actualized state, i.e. contextualized within the cognitive, sentient being in question as entities in *res cogitans*. Collectively the idea set in a given *res cogitans* is unique as it is reflective of that individual's specific set of beliefs which are a function of their specific upbringing and their specific set of experiences in the world. Following our quantum mechanical mathematical formulation, we conceive of this unique state of mind, this specific set of ideas, as a Fock space which is the tensor product of the set of the Hilbert spaces $\{H_i, H_j, \dots\}$, each idea corresponding to a given Hilbert space.¹³

As an example, take one's desire to quench one's thirst, the mind responding to the physical sensation of thirst let's say, which would cause the idea of thirst to be selected from the accessible universe of ideas (collective unconscious of Jung, Plato's forms, etc.), a process which we call *potentiation*, calling attention to the fact that at this stage the idea, the quenching of thirst, now rests in a potential state in the mind, ready to be considered for actualization. The ego, a personalized aspect of will, then operates (ideologically) against this idea of thirst and subjectifies it, which in turn collapses the ideological wavefunction into an actual state, i.e. a subjective idea, which in turn is then incorporated into the current state of mind in a process we call *potentiation* which we represent as

$$|\Psi_{M'}\rangle + |\phi_s\rangle = |\Psi_M\rangle$$

Here $|\Psi_{M'}\rangle$ represents the new state of mind which incorporates this idea of thirst, or $|\phi_s\rangle$. Once this idea has been conceived of, collapsed from an abstract notion of thirst in itself (Plato's forms, *res virtualis*) which embeds within it all possible variations of thirst as an idea, into an actual contextualized, individualized notion of thirst which is rooted in a cognitive sentient being in time and space (*res cogitans*), the individual in question is now in a position to start the process of determining how best to actualize this idea.

From this initial, actualized idea (which represents potential from a physical, state of the world perspective, hence the term *potentiation*), the individual is then in a position to conceive of how best to align the (physical, material) word such that this idea can be actualized. i.e. materialized in the world. This initiates the planning and other higher order faculties of the mind to consider the best way in which to realize the ideal of quenching its thirst, an idea which, if selected

¹³For a more detailed description of the mathematical definition of Fock spaces as they relate to Hilbert spaces in Quantum Mechanics see Wikipedia contributors (2021, December 17). Fock space. In Wikipedia, The Free Encyclopedia. Retrieved 11:16, February 14, 2022, from https://en.wikipedia.org/w/index.php?title=Fock_space&oldid=1060822169.

for fulfillment (passing some optimization gate).

The criteria again here which are evaluated to determine whether or not to pursue a given idea, a given potentiated idea, are a function of one's set of desires, set of fears, and other attributes that provide inputs to one's motivations, adopting a Freudian model of behavior that implies the optimization of the seeking of pleasure and the avoidance of pain, rooted in one's one personal risk-reward which determines how to weight each of the alternatives. All of these factors come into play (and more no doubt) when determining whether or not an idea should be pursued, or acted upon, i.e., passes the fulfillment criteria.

A solution, or set of actions, associated with the new idea of "*I shall quench my thirst*" is then devised which corresponds to the action(s) necessary, both intellectual and physical, to actualize this subjective idea of thirst quenching, to bring it into existence as a state of the world in physical reality, *res extensa*. The ego then, leveraging the current state of mind which contains a correspondence to the current state of the world, is re-applied the subjective idea of thirst quenching by acting, using its mind and body to bring about changes in the state of the world such that they will be brought into alignment with the state of "quenched thirst" which the ego is attempting to bring about.

Note that this may require several acts, or actions, each of which changes the state of the world, which in turn changes the correspondence of the state of the world in the state of mind, which leads to an adjustment of the set of actions required to bring said idea to fulfillment, which again is acted upon by the ego to bring about changes to the state of the world, and so on until the state of fulfillment is reached or it is determined that the achievement of said idea no longer satisfied its fulfillment criteria and is to be abandoned, if for example there is nothing to drink and it is easier to wait until later when a drink becomes more readily accessible.

We consider the final state of mind as a fixed state as well as the initial state of the mind when the ideafication process is completed, i.e. when it is recognized and established mentally that the cognitive, sentient being in question is in fact thirsty (through the process of potentiation). Given these assumptions, the actualization process for this specific action plan (set of actions) begins in the initial state of mind from which the final, desired state of mind is conceived of (imagined) given current context as represented in the current state of mind at the initial state.

The desired, future state of mind then, which would be a (Kantian) representation of the world in said desired state, which would be to a large degree dependent upon the current state of the world and state of mind, would be pursued by means of the action plan that is determined to optimally align the state of the world, bend it in a way, such that it reflects this future, desired state where one's thirst is quenched.

We can represent this process mathematically in the following manner, if $|\Psi_M\rangle$ is the final state of mind corresponding to the state of the world that is to

be achieved and $|\Psi_i\rangle$ is the initial state of mind and \hat{S}_i is the action that leads to the state of the world $|\beta_i\rangle$, we have:

$$\hat{S}_i|\Psi_i\rangle \rightarrow |\beta_i\rangle$$

[Note: we have used the sign \rightarrow to distinguish that the Hilbert space representing the mind space on the left-hand side, H_M is distinct from the Hilbert space of the world, H_W on the right-hand side of the equation].

When the state of the world $|\beta_i\rangle$ is achieved, the mind matches the state of the world with the final state of mind $|\Psi_M\rangle$ using the coefficient $|c_{\beta_i}|^2$, given as:

$$c_{\beta_i} = \langle \Psi_M | \beta_i \rangle$$

where the coefficient c_{β} is the inner product of the state of the world (representation thereof in the state of mind) and the state of the mind, i.e. an indicator of how much the state of mind agrees with the state of the world.

The evaluation part of the state of the world against the ideological state of mind that one is trying to achieve can be formulated as: If $|\Psi_\beta\rangle$ is the state of world and $|\Psi_M\rangle$ is the state of world in the state of mind then the difference factor c_β indicates the extent to which the state of the world $|\Psi_\beta\rangle$ agrees with the state of mind $|\Psi_M\rangle$, or

$$|c_\beta| = \langle \Psi_\beta | \Psi_M \rangle$$

where

$$0 < |c_\beta| < 1$$

where 0 corresponds to complete unfulfillment of the idea (current state versus future, ideological fulfillment state) and 1 corresponds to the fulfillment of the idea where the actual state of the world is equivalent with the fulfilled state of the idea in the state of the mind.

If the coefficient $|c_{\beta_j}|^2$ is equal to 1, then the state of the world corresponds to the state of the mind $|\Psi_M\rangle$ and the process stops as the idea is realized. If $|c_{\beta_j}|$ is not equal to 1, the state of the world $|\beta_i\rangle$ does not correspond to the final state of mind $|\Psi_M\rangle$, then the new state of mind is formed based on the present state of the world $|\beta_i\rangle$ and given as $|\Psi_j\rangle$ and another action \hat{S}_j is now applied to the state of mind $|\Psi_j\rangle$ that gives rise to the next state of the world, $|\beta_j\rangle$, the same process is again followed and the mind matches the new state of the world with the final state of mind using the coefficient $|c_{\beta_j}|^2 = 1$ condition, where

$$c_{\beta_j} = \langle \Psi_\beta | \beta_j \rangle$$

And the iterative process continues until the final state of the world matches with the final state of mind $|\Psi_M\rangle$. Hence, we have the successive operation of acts and a constant feedback loop which leads to the realization of the idea,

$$\hat{S}_n \dots \hat{S}_j \hat{S}_i |\Psi_i\rangle \rightarrow |\beta\rangle$$

where

$$\hat{S}_n |\Psi_n\rangle \rightarrow |\beta\rangle$$

where we have used the final action \hat{S}_n on the penultimate state of mind $|\Psi_n\rangle$ to arrive at the final state of the world $|\beta\rangle$ that corresponds to the final state of the mind $|\Psi_M\rangle$ represented by

$$\langle \Psi_M | \beta \rangle = 1$$

This ego then, this personalized actor in the *res cogitans* space in question (again a special faculty of will more or less), in conjunction with the current state of the mind and the current state of the world, acts against this subjective idea of “thirst quenching” (which is a set of actions in time and space essentially), and as such takes action to change the state of the world so as to bring about the necessary conditions so that the fulfillment of said idea is either met, or the chances of its being met have been optimized, based upon the current state of the world and the current state of mind that is encapsulated in *res cogitans*.

The ego brings about such necessary changes in the state of the world, using the actions available to it, such that the realized, actualized state of the world can be brought about that is optimally aligned with the subjective ideological state of quenched thirst which has a cognitive existence in the state of mind prior to its manifestation in the state of the world. Note that this is sort of an axiomatic assumption here to the model that the idea must exhaust in the mind before it becomes a reality so to speak.

Specifically then, what we are suggesting in our model then is that once the will has decided to fulfill the “quench thirst” idea, the intellect is activated and various dependent concepts (other ideas that may exist in the state of mind or exist in memory, an extension of the state of mind) are analyzed such that an optimal strategy for fulfillment is determined, again based upon the optimization problem of the least amount of will to be expended to bring about the fulfillment, or actualization of said idea, in the least amount of time with the least amount of effort, again constrained by the risk and reward profile of the individual cognizant, sentient being which is rooted in the idea that they will seek optimal pleasure while minimizing pain [Or alternatively, if S denotes the action, then the will designs a path to fulfill the idea following the principle of least action i.e. $\delta S = 0$ (Gray, 2018)].

This fulfillment plan of action we shall call it, is then passed through, or acted upon, by the ego, which in turn subjectifies these dependent ideas which in turn form the set of actions necessary to bring about the (optimal chance of the) fulfillment of the idea in question. This is the objectification process for the ideal state in question that is being fulfilled, or again an attempt at fulfillment is being made (not all attempts are successful).

Each action in turn changes the state of the world, and the corresponding state of the world in the state of mind, which in turn triggers the refinement of the subjective idea “quenching of thirst”, which in turn resets the set of actions ne-

cessary for the potential fulfillment of said idea (the objectification process). The first, or next, of these actions then, as identified and described in the state of mind, is then acted upon, or selected, by the ego as an actual action to be performed by the individual in the physical world, which in turn changes the state of the world, which in turn drive updates to the subjective idea of “thirst quenching”...

This loop continues until such time as the subjective ideological state is fulfilled or the fulfillment criteria is no longer met, because the amount of effort involved is too difficult relative to the strength of the desire to quench one’s thirst for example. This is basically the mechanical description of the functioning of mind as it relates to ideological waves which are selected and processed by the will and ego and which in turn drive actions in the world.

The first step of this process, or at least the place where we start the analysis (for its a recursive loop so theoretically the process can be thought of as beginning anywhere within the loop), is what we call the action design phase, where we have evaluated the current state of the world, given the context of the current state of the mind, identified a future state that we are looking to achieve, and identified an action plan to get us from A (current state) to B (future state).

This phase of the process we call Action Design, which we start at our initial state where time is set to 0 basically, or $t_0 = i$, and therefore the initial state of mind is denoted by $|\Psi_i\rangle$, where $|\Psi_i\rangle$ is a function of at least the following basic ideological components:

- The (mental representation of the) state of the world denoted by $|\beta_i\rangle$;
- The sum of all experiences of said cognitive, sentient being (xp);
- Social norms and ethics (e);
- Sociological and species-specific archetypes, narratives (m) [for mythos];
- Specific universal constraints (g).

Thus, we have something like:

$$\Psi_i = |(\beta_i, xp_i, e_i, m_i, g_i)\rangle$$

We then denote the desired future state of the world, that we are trying to actualize as¹⁴

$$\Psi_d = |(\beta_d, xp_d, e_d, m_d, g_d)\rangle$$

So we effectively need to determine how it is we get from current (initial) state (i) to future (desired) state (d). This is primarily a psychological problem, and again we defer to Freud’s pleasure principle more or less as the basic algorithm, where the desired (future) state represents an optimization of the highest gratification of “needs” and the avoidance of the most pain, or displeasure.

You can see the output of this algorithm yielding something along the lines of an action (or set of actions) that was thought to have the association with the

¹⁴Actually (no pun intended here), at any given time we are actualizing many different, but perhaps related, ideological states but for this example we take the simple case of just a single ideological state we are wishing to bring about.

highest probability of bringing about (actualizing) the desired state, again taking into account the balancing of the potential for both pleasurable and painful experiences associated with a given action or its consequences, and also at the same time minimizing the probability of happening of the non-desired states.

We now have an action plan, that is aligned with both my desired state, as well as my current (initial) state. It's the optimal path forward, relative to one's tastes and desires, dislikes and fears, combined with the impetus, the force of will, that one has to propel it towards one goal. There is a big difference for example, in terms of will, in what a wild animal will do to satiate its hunger if it is near starving versus if it just finished its last meal. This level of motivation (literally to move one forward) plays a deciding role in whether or not a given desired state is actualized.

This action plan then is designed specifically to optimize the outcome of a given desired state in the world, to become *actualized* using IRA nomenclature. This action plan is both associated with the highest probability of outcome (of achieving said desired, future, state) while minimizing exposure to fear, dislike etc., following Freud's theory of the pleasure principle more or less, while at the same time minimizing the level of effort, or level of energy expenditure (either in terms of number of actions or complexity related to the total set of actions) associated with a given action or set of actions that are being evaluated in said context.

In this context we define an action operator \hat{S} that represents the action which is applied by the subject to his (or her) objective, physical reality in their pursuit of the future, potential ideal state which we define above. This action operator \hat{S} represents the bridge between *res cogitans*, as reflected in its current state of mind and the future state it is looking to bring about, and the world itself, *res extensa*, a map of each (as representation) which exists in the current, and initial, state of mind. The action operator in this context then can be understood as the physical agent that looks to transform a given idea in the *res cogitans* into an act/event in the physical reality. An idea would remain an idea without this realization agent \hat{S} that connects the mental and the physical.

Using our quantum mathematical algebraic formulation then we have:

$$\hat{S}_i(\beta_i, \Psi_i) \rightarrow (\beta_j) \rightarrow \Psi_j$$

where $\hat{S}_i(\beta_i, \Psi_i)$ denotes the action at state i (initial state) that effects the state of the world at β_i which yields a new state of the world (β_j) which in turn yields a new state of the mind Ψ_j . Where $|\beta_j\rangle$ is the state of the world derived after the application of the action operator \hat{S}_i .

Mathematically, this new state of the world $|\beta_j\rangle$ can be understood as one of the possible worlds (*res extensa* instances) that lie inherent in the state of the world at the initial state β_i but which is made manifest, or actualized, by the specific action denoted as \hat{S}_i . This actualized state of the world has both an objective component, as understood through the laws of physics which describe objective reality (*res extensa*) and a mental component which facilitates the un-

derstanding of the same (res cogitans representation thereof).

This action operator then causes both a “collapse” of the physical wavefunction into a specific (epistemic) “version” of (physical) reality as well as changes the idealogical counterpart of the world in the state of mind to reflect both the new physical world state (β_j) and the new mental state Ψ_j which reflects the new world state as well as the knowledge gained by performing said action \hat{S}_i , a change in $x\mathcal{P}$ you could say, as we define it above. Thus we can see then, a sort of feedback loop is established, driven by action, which the state of the world evolves and our state of mind evolves in tandem with it. Note an action in this more broad context can be anything from lifting a cup of water to driving your car to eating a meal to watching the news on television. Any interface with physical reality would fall into this category.

However, it should also be noted that our state of mind depends not just on the state of the world, or our understanding or interpretation thereof, but also as we have outlined earlier, on a shifting state of (mental) reality which is a function both of the world outside of us, or *res extensa*, as well as the world inside of us, or *res cogitans*, the latter of which again includes an individuated component as well as a larger, collective component, or *res virtualis* in our model. This so-called virtual world, what Jung refers to as the collective unconscious, is representative of the collective metaphysical and idealogical constructs which bind us together, epistemically, as a family, a society, a nation, and ultimately humanity as a whole. This idealogical, or really epistemic, framework corresponds to what elsewhere we have described as the Metaphysics of Awareness, or alternatively the Seven Spheres, concepts which we explore and develop in previous works such as *Theology Reconsidered* (Valdez, 2019), *Metaphysics Reconsidered* (Valdez, 2022a) and *Homo Mysticus* (Valdez, 2022b).

The cycle then continues, with the mind (represented again by the ego as an instrument of will), re-evaluating the action plan based on the new information gained as a result of \hat{S}_i , and then acting against this revised, refined plan as \hat{S}_{i+1} , or \hat{S}_j .

$$\hat{S}_i \rightarrow \hat{e}|\Psi(\beta_j)\rangle = |\Psi_j\rangle \rightarrow \hat{S}_j$$

The mind then analyses this new state of the world, $|\beta_k\rangle$ which we denote as $|\Psi(\beta_k)\rangle$ (state of the world in the state of the mind at time = k , or loop = k) and then prepares a new action plan according to the very same principles defined above in the action design phase. The new state of mind is the sum of the cognition of the present state of the world β_k and the next action plan \hat{S}_j that leads to the collapse of state of the world to the new state of world β_l , and the cycle continues until such time as the desired state is reached or the goal itself is abandoned.

Generically then, we have:

$$\hat{e}|\Psi(\beta_{n-1})\rangle = |\Psi_n\rangle$$

and

$$\hat{S}_n |\Psi_n\rangle \rightarrow |\beta_{n+1}\rangle$$

The action and feedback process continues till the state of the world coincides with the desired state of the world $|\beta_n\rangle = |\beta_f\rangle$. Hence if Ψ is the state of mind for any given idea and β is the desired state of the world which corresponds to the state of mind Ψ then the condition for the idea realization is:

$$|c_\beta| = \langle \Psi | \beta \rangle = 1$$

where we have assumed that the Hilbert space for the mind (*res cogitans*) and the reality (*res extensa*) are dimensionally consistent.

Practically, or psychologically speaking, our conception of the desired, future state(s) continues to evolve and shift as new information becomes available through the shifting and changing world both around us and within us. As such the recursive loop we describe can be conceived as a sort of infinite regress where the goal(s) are never reached but we get, through a series of cyclical and recurring set of actions (*karma*), progressively “closer” to the desired state. An analogy can be drawn here between this recursive epistemic loop that we describe to the golden phi ratio, which is inherent in the Fibonacci series, a numeric series based upon ration that yields spirals and other interesting geometric patterns that we find in nature). The mental process that we conceive of here follows the same principles although we deal with concepts rather than numeric values.

We see that the state of mind and the state of world evolve simultaneously and are a function of each other, in a continual process, where Ψ_n participates in the creation of β_{n+1} as a result of \hat{S}_n , from which Ψ_{n+1} is resolved from which \hat{S}_{n+1} is derived.

Looking at the process more deeply we observe that the mind is pre creating the state of the world as a state of the mind and realizing it with the help of agents (of will) like the action operator (Manousakis, 2006) which actualize the potential state of the world, a reality which sits in (epistemic) superposition to us as creative beings. This actualized state of the world is then synchronized with an updated state of the mind (as a result of the analysis and synthesis of the action itself relative to the initial state of the mind pre-action) which in turn collapses the state of the mind (idealogically) which yields revised desired states and revised action plans that correspond with said states, which in turn lead to the next action which leads to the creation of the next state of the world. The state of the mind collapses the state of the world, and the state of the world collapses the state of the mind and the process is perpetually continuous in the forward direction of time.

One can say that our reality, epistemologically speaking, is both a function of this (recursive) process and is also characterized by this process. Knowledge itself in this sense, as conceived of as a set of ideas that exist in the mind and are acted out in the world, can be understood as a continual process of enfolding (feedback loop of new information post action) and unfolding (new action identified and performed) to bring about change in the world which is (at least in-

tended to be) aligned with our desires or needs. Our ideological mechanics in this sense can be understood as a mathematical description of the process of holomovement that Bohm describes as a potential solution to the paradoxes inherent in Quantum Mechanics.

6. On Mind, Matter & Meaning

If we take this epistemic bent then, presume that knowledge, real information, is the most basic structure of the universe, our *epistemological ontology* as we're calling it, we end up with a very different picture of the universe than say if we take the physicalist or materialistic approach as has been predominant since the Enlightenment more or less. We also of course don't end up with this ontology by accident, Physics itself has led us here (black hole thermodynamics, holography, quantum mechanics, neuroscience...). What seems to be happening here, with respect to the state of the world (no pun intended) intellectually, is that science itself is starting to converge on some of the very same principles of interconnectedness, of wholeness, very ancient ideas mind you, from a variety of perspectives or vantage points, from the various academic disciplines in and of themselves basically. We see this perhaps most prominently in the field of philosophy and to a lesser extent perhaps in the humanities more broadly, but we also see this collision course somewhat ironically from the most "objective" of the sciences, from Physics itself. All of these various disciplines, these various perspectives on knowledge, which is what science means ultimately, have become confronted in one way or another with this thing we like to call *consciousness* (the dreaded c word), and each of them is having to delve, somewhat clunkily and uncomfortably at times we must say, into the realm of philosophy to find at least the basis within which they can even provide answers to some of these fundamental questions, like why it is that biology exists at all, why it is that neurons fire the way they do, and what it is, or how it is, that existence itself has "come to be".

Not by accident of course, what we are also seeing, is that each of these academic disciplines in their own way seems to be converging on this notion of an organic, participatory version of reality, an idea that sits at the heart of many of the ancient philosophical traditions, perhaps most notably Daoism (*Lao-Tzu, I Ching*), Stoicism and Vedānta (Upanishadic philosophy primarily in its non-dual, Advaita form). Physics in particular, with the introduction and acceptance of Quantum Theory experimentally validates these claims to at least some degree, directly from and out of the materialistic and physicalist perspective of reality paradoxically. What seems to be missing however from this dialogue, is how it is that psychology, or as we describe it herein *mind*, which exhibits characteristics that defy (like Quantum Mechanics in fact), the laws of time and space as we understand them through classical physic (e.g. the various psi phenomena such as pre-cognition or retro-causation for example, see (Bem, 2011; Bem et al., 2016)), fits into this intellectual paradigm. And yet if the universe itself is some-

how conscious, then they must exhibit, be subject to, psychology at least in some form. Once this intellectual step is allowed, one can also conceive of psychological metaphysics if we may coin a term, as facilitating the understanding of psychology more generally, as it relates to understanding human behavior and motivation for example.

If we approach the problem through a mechanical lens, specifically through a quantum mechanical lens, we are confronted with this problem of paradoxes, this philosophical abyss where we are confronted with the problem of distinguishing between the perceiver and the perceived, or the subject and object, or more generally the mind and matter itself. To get even more into the mechanical weeds as it were, what we are presented with given the results of, and various forms of, the famed double slit experiment is that 1) reality itself doesn't manifest in a definable and specifically measurable way until it is observed in some sense, and that 2) reality can be conceived of as both a wave and matter (particles) depending on how we choose to look at it.

The sheer profound implications of this fundamentally mechanical discipline, well established through physical experiments at this point, cannot be overstated. It really changes everything and even after 100 years since its "discovery", no clear consensus has been come to as to what it is that it really means. The irony here, certainly as it related to this work in particular which presumes meaning itself is primary, through information, is rich to say the least. But again what appears to be missing from the various approaches, really interpretations, of this mind-matter distinction which now presents itself through physics itself, is a clear picture of this psycho-physical bridge, a framework for describing how it is we move from one field to the other, and what sort of transformations and transmutations arise as we pass through this theoretical (information based) interface.

I am most certainly not the only person aware of this or working on this problem, but it would seem, in perhaps a somewhat naïve and overly optimistic way (a state of mind from which all great innovation comes arguably), that I have something to contribute to these discussions. I believe the physics is here already, we just need to put the pieces together, follow the intellectual (scientific) breadcrumbs as it were, breadcrumbs which seem to lead at the doorstep of philosophy, yes, but from an engineering perspective, a perspective close to home, right into the heart of information systems theory. For it would appear that information, or knowledge in its very specific and idempotent sense, seems to be the place not just where the various laws of physics appear to merge (holographic principle again) but where the bridge between mind and matter *must* be drawn. It's information theory, a theory which is predicated on meaning, its underlying structure as it relates to top said meaning (language), which also can be used to provide the basis for understanding both man, from a psychological perspective, as well as machine, from a computing and software engineering (and systems) perspective.

What all intellectual based endeavors are predicated upon in fact, is that they all represent various modes of, and structures of, meaning which are in turn encoded in various symbols and structures that are inherent to each of the respective intellectual disciplines, each of which is represented in a specific academic domain, and if applied in the most general sense, can be understood to reflect the intelligent structure of the universe itself. But if we want to understand what these intellectual models are telling us, what they mean, especially the ones that underpin physics that consist basically of algebraic and mathematical formulations of “measurable things” (measurables we call them elsewhere) and their respective relations to each other, we find ourselves in the awkward position of (what again Quantum Mechanics reveals to us quite directly, and paradoxically) being faced with the fact that, in a quite precise and measurable way, we participate in the very construction of objective reality itself.

This is such an odd and unexpected situation, so at odds with how it is, we conceived of the foundation of physical reality, that we have been struggling with what to make of this empirical fact for the better part of 100 years. Whatever place we come to, however, we must at least if we try to elicit some ontological understanding from the mechanics itself, consider both the physical as well as the mental aspects of reality as fundamental to any description of reality. This is ultimately how we arrive at IRA.

This mind-matter conundrum has a deep history in ancient mystery and mystical traditions of course, which in its most radical form, of course, we are confronted with the age-old Hermetic adage that tells us, “as above so below”, an adage we find in the gnostic Gospel of Thomas (verse 22) as well,

When you make the two one, and when you make the inside as the outside, and the outside as the inside, and the upper as the lower, and when you make the male and the female into a single one, so that the male is not male and the female not female, and when you make eyes in place of an eye, and a hand in place of a hand, and a foot in place of a foot, an image in place of an image, then shall you enter [the kingdom].¹⁵

The implication here is that if indeed we are to fully understand how it is that the inside and outside are related, how it is that the state of mind relates to the state of the world in our parlance, we may in fact be presented with, confronted with, some of the highest order mystical knowledge known to man throughout (recorded) history.

But if the world “above” and the world “below” are mirrors of each other, as we see in fractal geometry for example, or with the golden phi ratio and Fibonacci numbers (Valdez, 2022b), then we must ask ourselves what it is that is being reflected? This is of course a very good question, one that arguably lies arguably at the very heart of the Western intellectual exercise. The word essence comes from the Latin word *essentia*, which is the typical translation of the Aris-

¹⁵*Gospel of Thomas*, verse 22. Translation by Blatz, from <http://www.earlychristianwritings.com/thomas/gospelthomas22.html>.

totelian term for substance, or *ousia* in the Greek, which lays at the heart of Aristotle's notion of substantial form, which lays at the heart of both his metaphysical enterprise, i.e. first philosophy, as well as his physical enterprise, i.e. natural philosophy.

Following this line of thought then to its natural conclusion, we find that in our most essential nature we are in fact fractals of consciousness in a sea of consciousness. From the smallest of cells in our bodies, to the plants and trees and all living things, to the cosmos itself, it's all alive and flowing in a constant, vibrating and pulsating energetic epiphany. This is in essence (pun intended) what all the mystery traditions from antiquity teach us, what Yoga and Daoism teach us, and even the Abrahamic religions too, for all their flaws. We see this for example in Genesis, where it is put forward that we are created in the image of God. Pretty sure this doesn't mean that God looks like us.

The missing piece then intellectually, given our again almost obsessive reliance on objective facts as the only means by which scientific truths can be arrived at since religion was discarded for science in the post-enlightenment intellectual era, is necessarily, a relaxing of the objective, mechanistic, materialistic worldview to include the conscious observer into the model itself. In other words, in order to understand what quantum mechanics *means* we must have a good working definition of *meaning* itself, the one is not possible without the other. This sounds obvious but at the same time is oft confused by physicists and scientists who take the almost religious (using that term loosely here to denote devoid of reason) position that somehow when the universe was created, it came with an operator's manual that included the laws of physics and mathematics as well as well formed definitions of things such as mass, energy, light, gravity and other terms that provide the (epistemic) foundations of physics.

And while many academic disciplines have made marked progress rooting their respective disciplines on more "scientific" grounds (cognitive science and psychology for example), these new grounds have mostly been physicalist and materialist, which tells only part (really half) of the story. It is from this school of thought for example that consciousness is an emergent (physicalist) phenomenon that comes from. We shall no doubt be waiting for a long time before a computer becomes conscious. We can talk about it, create movies about it, tell stories about it, but do we really think that consciousness is something that can be manufactured? In the same way, a pipe or a car is manufactured? We remain deeply confused as to what consciousness is and where it comes from, hence the dreaded *c* word designation.

Yes the math is beautiful and harmonic, begging all sorts of questions about intelligent design, but its math that we have conceived of, through our participation in the creation of the science itself. This all points to the need for a higher order framework of understanding that not only deals with physical phenomenon, noumena or "measurable", but also fundamentally incorporates us as thinking, cognitive agents (scientists some call us) who frame and construct these expe-

riments, and from which the underlying intellectual frameworks that underpin said experiments are thought up with, to begin with. We've reached a point on our intellectual journey as a species where we can no longer ignore this truth, that the complete picture of the world, of reality, depends just as much on us as cognitive, sentient beings as it does on the objective aspect of the world, which we know and understand through our perception of it. Somewhat paradoxically again, this puts us back to the very beginning of the philosophical tradition in the West, for Plato and Aristotle (and Socrates and the rest of the Pre-Socratics for that matter) did not conceive of an objective world that was devoid of perception, this was a much later, really post-Enlightenment, development.

This higher order truth from which both subjective and objective reality, mind and matter, yin and yang, unfold out of is what Bohm referred to as the *implicate order*, the ever changing and shifting source of all aspects of (experiential) existence from which both mind and matter emerge as a constant interplay of interconnected, cosmic dancing energy, what Bohm called the *holomovement* and which the ancient Indians conceived of as Dancing Siva (Shiva), or *Naṭarāja* (Figure 7).

This is ultimately what we should take away from Quantum Mechanics, at least when we apply a knowledge based lens as we do here. That all things, which include cognitive sentient beings as well as the things we typically conceive of as objective, stem from the same source, a source that somehow comes together in



Figure 7. Depiction of dancing siva from¹⁶.

¹⁶Photo from Wikipedia commons by Jean-Pierre Dalbéra from Paris, France, Temple troglodytique dédié à Shiva (Badami, Inde), CC BY 2.0, <https://commons.wikimedia.org/w/index.php?curid=37213652>.

the very act of experience itself. This is how the mind and matter meet. We are the tool, our mind-body system itself, from which experience emerges and by which anything at all can be said to exist. Existence, by definition, doesn't exist without anyone to recognize, or cognize, it. It's a non sequitur. With no experiencer there exists just an infinite void of, well nothing. In this sense then, from an epistemological perspective at least, we are the experiment in the sense that it is from us, from the act of cognition and awareness associated with it, that any understanding of the act of (objective) measurement, to use quantum mechanical parlance, can be made "sense" of. It is from our psyche, from our "minds", what von Neumann referred to in the most scientific way possible as the "abstract ego", from which any sort of meaning related to any sort of experience must both depend on and emerge from.

People miss this, scientists miss this, all the time. This seemingly glaringly obvious fact doesn't stare them in the face necessarily, it is their face. The very intellectual ground upon which one's persona is based is the very same ground upon which all reality is experienced and can be said to exist at all. We have the ability to influence our physical reality, this is fact. How integrated is this reality to "us"? This is the open question, and this is the spectrum within which we measure the scale of the Metaphysics of Awareness (Valdez, 2019, 2022a). The thing is, we need to change our perspective to see this truth, or this alternate truth as you might call it. We don't have to necessarily believe that the epistemic universe is the true universe, the right one so to speak, but we are really led to the conclusion that if we exist in a universe that has some meaning to it, then this universe needs to be looked at through an epistemic lens. What we propose here, with IRA, is a reference frame for said lens.

Where we are led to, quite unexpectedly I think it is fair to say, is to at least a place where it must be considered that some of these ancient texts might have been pretty spot on when they spoke of the world as not quite as real as we make it out to be, as a rope at dusk can be confused for a snake as we are taught in Indian philosophy, i.e. the doctrine of *Maya*. This isn't so much religious conviction that they have been teaching for all these thousands of years, perhaps it is a valid empirical truth from a certain vantage point. The vantage point has to be supra-physical of course but who is to say that this vantage point is any more or less valid than the physical one? We can let the academics argue about this ad nauseum but for us here we presume at least that it is equally valid, and entertain the possibility that it might in fact be, as mystics across cultures in time and space have been telling us since time immemorial, in fact more real than the physical reality is that we experience in our daily, conscious waking lives.

From this vantage point then, from an epistemic and information-based vantage point that we try to capture algebraically and mathematically herein with IRA, reality can be best understood as (and this is consistent with both Kant and Schopenhauer's position really) a sort of holographic projection of mental phenomena onto the physical world. That we not only interpret the world around us

based upon our prior experience, upbringing and general mental constitution, but that in some sense we participate in the very creation of the material world, as again we perceive it and as we look to make sense of it. This isn't a mystical proposition as much as it is a necessary, logical conclusion to be drawn from the efforts to understand the nature of reality as it has been revealed to us through physics specifically and the sciences more generally in the 21st century.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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